



NAVAL FACILITIES ENGINEERING SERVICE CENTER

WASHINGTON, D.C. 20374-5063

CONTRACT NO - N47408-99-D-8014

**DELIVERY ORDER NO 0015 PIPELINE MODIFICATIONS AND REPAIRS
NAVSTA ROOSEVELT ROADS, CEIBA, PUERTO RICO**

DESC PROJECT NO. DESC RRD 01-12

Project Certification Report

Pipeline Repairs and Modifications

NAVSTA Roosevelt Roads, Puerto Rico

Volume II

Project No: 065/07074-18

Date: 09-Jan-2003

Worley Report No.: 707418/G49-0248D

DESC Report No.: SSR-2756-E&U



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NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO



J-05 Welding – Radiographic Inspection of Welds Reports



iron works inc.

ONSO & CARUS

P.O. BOX 566 - CATANO, PUERTO RICO 00963
TELEPHONE: (787) 788-1065
FAX: (787) 788-0350

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____

DATE 4/04/02

LICENSE No. 52-21350-01

PROCEDURE No. _____

PAGE 1 OF _____

CLIENT	P.O. No.	DESCRIPTION	SCREENS	LEAD	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	FILM TECHNIQUE	MATERIAL	FILM VIEWING	WELDING PROCESS	FILM TOTAL	TECHNICIAN	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH		
																ACCEPT	REJECT	PIPE SIZE	No. OF FILM	FILM SIZE
WORLD 14 T-1		Pre-FAB Tanker Line			12"	1.45	0.020	.010 FRONT & BACK	<input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE	c/k	<input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE	<input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN	15"	F. R. R. - 2						
PROJECT JOB No. <u>7074-18 Main Base Roosevelt Road</u>																				
DIMENSIONS <u>10 X .11 LOG</u>																				
CURIES <u>66</u>																				
FITTING SEAM OR JOINT No. _____																				
FILM IDENTITY No. _____																				
ACCEPT																				
REJECT																				
PIPE SIZE _____																				
No. OF FILM _____																				
FILM SIZE _____																				
CODE _____																				
CODE KEY																				
A - LACK OF PENET															A					
B - LACK OF FUSION															B					
C - CRACKS															C					
D - SLAG															D					
E - POROSITY															E					
F - UNDERCUT ROOT															F					
G - UNDERCUT CAP															G					
H - TUNGSTEN															H					
I - CONCAVITY CAP															I					
J - CONCAVITY ROOT															J					
K - WORM HOLE															K					
L - BURN THROUGH															L					
M - HOT TEAR															M					
N - PIN HOLE															N					
O - HIGH LOW															O					
TECHNIQUE A															TECHNIQUE A					
TECHNIQUE B															TECHNIQUE B					
TECHNIQUE C															TECHNIQUE C					
TECHNIQUE D															TECHNIQUE D					
TECHNIQUE E															TECHNIQUE E					
TECHNIQUE F															TECHNIQUE F					

EXPOSURE DEVICE B-1274

INTERPRETED BY

LEVEL III

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOF

AC JOB No. _____ DATE 4/19/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE 2 OF _____

CLIENT	DIAMETER	CODE OR SPECIFICATION	P.O. No.	DESCRIPTION	SCREENS	LEAD	DISTANCE	CURIES	TIME	UNSHARPNESS	FILM PROCESSING MANUAL	TECHNICIAN	MATERIAL	FILM VIEWING		WELDING PROCESS	
														DOUBLE	SINGLE		DOUBLE
WOLLEY Int'l	10"	APT 1104		Pre-fab Transfer line	.010 FRONT & BACK		12"	66	1:45	0.020		F. Kraus	ck	<input type="checkbox"/> DOUBLE	<input checked="" type="checkbox"/> SINGLE	<input type="checkbox"/> AUTO	<input checked="" type="checkbox"/> MAN
IR-192	10 X .11 LOG																
PROJECT JOB No. <u>7074-18 MAIN PIPE ROSEVELT BRIDGE</u>													FILM TOTAL <u>6</u>				
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE		PENETRATOR SIZE		SHOOTING SKETCH				
									TECHNIQUE (A)	TECHNIQUE (B)	SOURCE SIDE	FILM SIDE	TECHNIQUE A	TECHNIQUE B			
X1-6	6	✓	✓	6"	1	6"	AAB-P-466 MOD-8	A - LACK OF PENET							TECHNIQUE B		
X1-1	1-1	✓	✓	6"	1	6"		B - LACK OF FUSION							TECHNIQUE A		
X1-2	1-2	✓	✓	6"	1	6"		C - CRACKS							TECHNIQUE A		
X1-3	2-0	✓	✓	6"	1	6"		D - SLAG							TECHNIQUE A		
X1-4	4	✓	✓	6"	1	6"		E - POROSITY							TECHNIQUE A		
X1-5	0-1	✓	✓	6"	1	6"		F - UNDERCUT ROOT							TECHNIQUE A		
X1-6	1-2	✓	✓	6"	1	6"		G - UNDERCUT CAP							TECHNIQUE A		
X1-7	2-0	✓	✓	6"	1	6"		H - TUNGSTEN							TECHNIQUE A		
								I - CONCAVITY CAP							TECHNIQUE A		
								J - CONCAVITY ROOT							TECHNIQUE A		
								K - WORM HOLE							TECHNIQUE A		
								L - BURN THROUGH							TECHNIQUE A		
								M - HOT TEAR							TECHNIQUE A		
								N - PIN HOLE							TECHNIQUE A		
								O - HIGH LOW							TECHNIQUE A		

EXPOSURE DEVICE B-1374 INTERPRETED BY [Signature] LEVEL III



IRON WORKS INC.
 P.O. BOX 566 - CATANO, PUERTO RICO 00963
 TELEPHONE: (787) 788-1065
 FAX: (787) 788-0350

ADIOPHONY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 4/20/87 PAGE _____ OF _____
 LICENSE No. 52-21350-01 PROCEDURE No. _____

CLIENT	THICKNESS	DIAMETER	CODE OR SPECIFICATION	P.O. No.	DESCRIPTION	SCREENS	LEAD	DISTANCE	TIME	UNSHARPNESS	FILM PROCESSING MANUAL	FILM THICKNESS	FILM TECHNIQUE	MATERIAL	FILM VIEWING		FILM TOTAL																																																																																																																																																																																																																																																																
															DOUBLE	SINGLE		DOUBLE	SINGLE																																																																																																																																																																																																																																																														
ISOPOPE	DIMENSIONS	CURIES		FILM PROCESSING		TYPE II KODAK		WELDING PROCESS		FILM TYPE		TYPE II KODAK		AUTO		MAN																																																																																																																																																																																																																																																																	
<u>Whalley Tub.</u>	<u>372</u>	<u>12"</u>	<u>APT 1100</u>	<u>60</u>	<u>12"</u>	<u>0.020</u>	<u>12"</u>	<u>12</u>	<u>12</u>	<u>0.020</u>	<u>MANUAL</u>	<u>.010 FRONT & BACK</u>	<input type="checkbox"/> DOUBLE	<input type="checkbox"/> SINGLE	<input type="checkbox"/> DOUBLE	<input checked="" type="checkbox"/> SINGLE	<u>2</u>																																																																																																																																																																																																																																																																
<table border="1"> <thead> <tr> <th rowspan="2">FITTING SEAM OR JOINT No.</th> <th rowspan="2">FILM IDENTITY No.</th> <th rowspan="2">ACCEPT</th> <th rowspan="2">REJECT</th> <th rowspan="2">PIPE SIZE</th> <th rowspan="2">NO OF FILM</th> <th rowspan="2">FILM SIZE</th> <th rowspan="2">CODE</th> <th rowspan="2">CODE KEY</th> <th rowspan="2">EXPOSURE TECHNIQUE</th> <th colspan="2">PENETRATOR SIZE</th> <th colspan="2">SHOOTING SKETCH</th> </tr> <tr> <th>SOURCE SIDE</th> <th>FILM SIDE</th> <th>TECHNIQUE A</th> <th>TECHNIQUE B</th> </tr> </thead> <tbody> <tr> <td><u>X12-6D</u></td> <td><u>0-1</u></td> <td><u>1</u></td> <td><u>1</u></td> <td><u>1 1/4"</u></td> <td><u>1</u></td> <td><u>1 1/4"</u></td> <td></td> <td>A - LACK OF PENET</td> <td><u>TECHNIQUE A</u></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>B - LACK OF FUSION</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>C - CRACKS</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>D - SLAG</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>E - POROSITY</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>F - UNDERCUT ROOT</td> <td><u>TECHNIQUE A</u></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>G - UNDERCUT CAP</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>H - TUNGSTEN</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>I - CONCAVITY CAP</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>J - CONCAVITY ROOT</td> <td><u>TECHNIQUE C</u></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>K - WORM HOLE</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>L - BURN THROUGH</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>M - HOT TEAR</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>N - PIN HOLE</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>O - HIGH LOW</td> <td><u>TECHNIQUE E</u></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><u>TECHNIQUE D</u></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><u>TECHNIQUE F</u></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td></td> <td></td> </tr> </tbody> </table>																		FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH		SOURCE SIDE	FILM SIDE	TECHNIQUE A	TECHNIQUE B	<u>X12-6D</u>	<u>0-1</u>	<u>1</u>	<u>1</u>	<u>1 1/4"</u>	<u>1</u>	<u>1 1/4"</u>		A - LACK OF PENET	<u>TECHNIQUE A</u>	<input type="checkbox"/>	<input type="checkbox"/>											B - LACK OF FUSION														C - CRACKS														D - SLAG														E - POROSITY														F - UNDERCUT ROOT	<u>TECHNIQUE A</u>	<input type="checkbox"/>	<input type="checkbox"/>											G - UNDERCUT CAP														H - TUNGSTEN														I - CONCAVITY CAP														J - CONCAVITY ROOT	<u>TECHNIQUE C</u>	<input type="checkbox"/>	<input type="checkbox"/>											K - WORM HOLE														L - BURN THROUGH														M - HOT TEAR														N - PIN HOLE														O - HIGH LOW	<u>TECHNIQUE E</u>	<input type="checkbox"/>	<input type="checkbox"/>												<u>TECHNIQUE D</u>	<input type="checkbox"/>	<input type="checkbox"/>												<u>TECHNIQUE F</u>	<input type="checkbox"/>	<input type="checkbox"/>		
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EXPOSURE DEVICE R-1324 INTERPRETED BY [Signature] LEVEL _____

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 4/29/02 PROCEDURE No. _____ PAGE 3 OF _____
 LICENSE No. 52-21350-01

CLIENT <u>Worley Intl.</u>	P.O. No.	DESCRIPTION <u>Proc. Air Transfer Unit</u>	MATERIAL <u>cf</u>
THICKNESS <u>365</u>	DIAMETER <u>10"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>10"</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No. <u>2074-18</u>	CURIES <u>66</u>	TIME <u>.35</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		UNSHARPNESS <u>0.020</u>	FILM TOTAL
		FILM PROCESSING MANUAL	TECHNICIAN <u>J. Rivera</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	DESCRIPTION	CODE KEY	EXPOSURE TECHNIQUE	
										PENETRATOR SIZE	SOURCE SIDE
X11-8	0-1	✓	✓	12 1/8	4	4x		MOR-15-DEM	A - LACK OF PENET		TECHNIQUE B
X11-9	1-2	✓	✓	12 1/8	4	4x		DEM	B - LACK OF FUSION		TECHNIQUE A
X11-10	2-0	✓	✓	12 1/8	4	4x			C - CRACKS		TECHNIQUE C
X11-11	0-1	✓	✓	12 1/8	4	4x			D - SLAG		TECHNIQUE D
X11-12	1-2	✓	✓	12 1/8	4	4x			E - POROSITY		TECHNIQUE E
X11-13	2-0	✓	✓	12 1/8	4	4x			F - UNDERCUT ROOT		TECHNIQUE F
X11-14	0-1	✓	✓	12 1/8	4	4x			G - UNDERCUT CAP		TECHNIQUE A
X11-15	1-2	✓	✓	12 1/8	4	4x			H - TUNGSTEN		TECHNIQUE C
X11-16	2-0	✓	✓	12 1/8	4	4x			I - CONCAVITY CAP		TECHNIQUE D
X11-17	0-1	✓	✓	12 1/8	4	4x			J - CONCAVITY ROOT		TECHNIQUE D
X11-18	1-2	✓	✓	12 1/8	4	4x			K - WORM HOLE		TECHNIQUE E
X11-19	2-0	✓	✓	12 1/8	4	4x			L - BURN THROUGH		TECHNIQUE F
X11-20	0-1	✓	✓	12 1/8	4	4x			M - HOT TEAR		TECHNIQUE A
X11-21	1-2	✓	✓	12 1/8	4	4x			N - PIN HOLE		TECHNIQUE C
X11-22	2-0	✓	✓	12 1/8	4	4x			O - HIGH LOW		TECHNIQUE D



iron works inc.
 P.O. BOX 566 - CATAÑO, PUERTO RICO 00963
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RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/24/62 PAGE 1 OF 1
 LICENSE No. 52-21350-01 PROCEDURE No. _____

CLIENT <u>Colby 7-11</u>	P.O. No.	DESCRIPTION <u>Pump House 1982</u>	PROCEDURE No.	MATERIAL
THICKNESS <u>7/8"</u>	DIAMETER <u>10"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM THICKNESS <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE	FILM VIEWING <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
ISOPOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>10'</u>	UNSHARPNESS <u>0.020</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input type="checkbox"/> MAN
PROJECT JOB No.	CURIES <u>930</u>	TIME	FILM PROCESSING MANUAL	FILM TOTAL

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
<u>VR</u>	<u>10-A</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>A - LACK OF PENET</u>	<u>A - LACK OF PENET</u>	<u>TECHNIQUE A</u>			<u>TECHNIQUE B</u>
<u>VR</u>	<u>0-7</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>B - LACK OF FUSION</u>	<u>B - LACK OF FUSION</u>	<u>TECHNIQUE C</u>			<u>TECHNIQUE D</u>
<u>VR</u>	<u>0-8</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>C - CRACKS</u>	<u>C - CRACKS</u>	<u>TECHNIQUE E</u>			<u>TECHNIQUE F</u>
<u>VR</u>	<u>1-9</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>D - SLAG</u>	<u>D - SLAG</u>	<u>TECHNIQUE G</u>			<u>TECHNIQUE H</u>
<u>VR</u>	<u>0-7</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>E - POROSITY</u>	<u>E - POROSITY</u>	<u>TECHNIQUE I</u>			<u>TECHNIQUE J</u>
<u>VR</u>	<u>0-8</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>F - UNDERCUT ROOT</u>	<u>F - UNDERCUT ROOT</u>	<u>TECHNIQUE K</u>			<u>TECHNIQUE L</u>
<u>VR</u>	<u>0-8</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>G - UNDERCUT CAP</u>	<u>G - UNDERCUT CAP</u>	<u>TECHNIQUE M</u>			<u>TECHNIQUE N</u>
<u>VR</u>	<u>1-9</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>H - TUNGSTEN</u>	<u>H - TUNGSTEN</u>	<u>TECHNIQUE O</u>			<u>TECHNIQUE P</u>
<u>VR</u>	<u>1-9</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>I - CONCAVITY CAP</u>	<u>I - CONCAVITY CAP</u>	<u>TECHNIQUE Q</u>			<u>TECHNIQUE R</u>
<u>VR</u>	<u>0-7</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>J - CONCAVITY ROOT</u>	<u>J - CONCAVITY ROOT</u>	<u>TECHNIQUE S</u>			<u>TECHNIQUE T</u>
<u>VR</u>	<u>0-8</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>K - WORM HOLE</u>	<u>K - WORM HOLE</u>	<u>TECHNIQUE U</u>			<u>TECHNIQUE V</u>
<u>VR</u>	<u>0-7</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>L - BURN THROUGH</u>	<u>L - BURN THROUGH</u>	<u>TECHNIQUE W</u>			<u>TECHNIQUE X</u>
<u>VR</u>	<u>0-8</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>M - HOT TEAR</u>	<u>M - HOT TEAR</u>	<u>TECHNIQUE Y</u>			<u>TECHNIQUE Z</u>
<u>VR</u>	<u>1-9</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>N - PIN HOLE</u>	<u>N - PIN HOLE</u>	<u>TECHNIQUE AA</u>			<u>TECHNIQUE AB</u>
<u>VR</u>	<u>0-8</u>	<u>✓</u>	<u>✓</u>	<u>10"</u>	<u>17</u>	<u>17</u>	<u>O - HIGH LOW</u>	<u>O - HIGH LOW</u>	<u>TECHNIQUE AC</u>			<u>TECHNIQUE AD</u>

EXPOSURE DEVICE 121374 INTERPRETED BY _____ LEVEL _____

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 4/29/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE 9 OF _____

CLIENT <u>MORLEY Tutl.</u>	P.O. No.	DESCRIPTION <u>PIPE TRANSVERSE</u>	MATERIAL <u>elb</u>
THICKNESS <u>.325</u>	DIAMETER <u>8"</u>	SCREENS <u>010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	DISTANCE <u>8</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No. <u>2074-18</u>	CURIES <u>66</u>	TIME <u>.20</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		UNSHARPNESS <u>0.020</u>	TYPE II KODAK
		FILM PROCESSING MANUAL	FILM TOTAL <u>9</u>
			TECHNICIAN <u>F. PEREZ</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	DESCRIPTION	CODE KEY	EXPOSURE TECHNIQUE	
										PENETRATOR SIZE	SOURCE SIDE
<u>14</u>	<u>14</u>	<u>✓</u>	<u>8"</u>	<u>9</u>	<u>4/4</u>	<u>12</u>	<u>MOD-1 PIER-1A</u>	<u>DFM</u>	<u>12</u>	<input checked="" type="checkbox"/> SOURCE SIDE	<input type="checkbox"/> FILM SIDE
<u>15</u>	<u>15</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>16</u>	<u>16</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>17</u>	<u>17</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>18</u>	<u>18</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>19</u>	<u>19</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>20</u>	<u>20</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>21</u>	<u>21</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>22</u>	<u>22</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>23</u>	<u>23</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>24</u>	<u>24</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>25</u>	<u>25</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>26</u>	<u>26</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>27</u>	<u>27</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>28</u>	<u>28</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>29</u>	<u>29</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					
<u>30</u>	<u>30</u>	<u>✓</u>	<u>8"</u>	<u>12</u>	<u>4/4</u>	<u>12</u>					



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RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOF

AC JOB No. _____

DATE _____

LICENSE No. 52-21350-01

PAGE _____

OF _____

FITTING SEAM OR JOINT No.	FILM IDENTIFICATION No.	ACCEPT	REJECT	PIPE SIZE			NO. OF FILM	CODE	DESCRIPTION				MATERIAL	FILM VIEWING □ DOUBLE □ SINGLE					
				FILM SIZE	ACCEPT	REJECT			DIAMETER	CODE OR SPECIFICATION	CURIES	DISTANCE			LEAD	SCREEN THICKNESS	UNSHARPNESS	TYPE II KODAK	FILM TOTAL
100	75			4" / 4"	10 X .11 LOG		170	A - LACK OF PENET											
				4" / 4"			170	B - LACK OF FUSION											
				4" / 4"			170	C - CRACKS											
				4" / 4"			170	D - SLAG											
				4" / 4"			170	E - POROSITY											
				4" / 4"			170	F - UNDERCUT ROOT											
				4" / 4"			170	G - UNDERCUT CAP											
				4" / 4"			170	H - TUNGSTEN											
				4" / 4"			170	I - CONCAVITY CAP											
				4" / 4"			170	J - CONCAVITY ROOT											
				4" / 4"			170	K - WORM HOLE											
				4" / 4"			170	L - BURN THROUGH											
				4" / 4"			170	M - HOT TEAR											
				4" / 4"			170	N - PIN HOLE											
				4" / 4"			170	O - HIGH LOW											

EXPOSURE TECHNIQUE

PENETRATOR SIZE
 SOURCE SIDE
 FILM SIDE

SHOOTING SKETCH

TECHNIQUE A

TECHNIQUE B

TECHNIQUE C

TECHNIQUE D

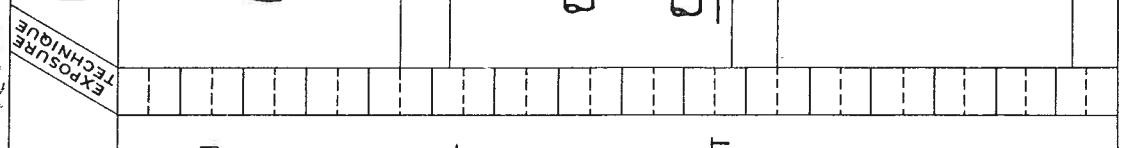
TECHNIQUE E

TECHNIQUE F

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOF

AC JOB No. _____ DATE 4/25/82 PROCEDURE No. _____ PAGE _____ OF _____
 LICENSE No. 52-21350-01

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	DESCRIPTION	SCREENS LEAD	DISTANCE	TIME	UNSHARPNESS	FILM PROCESSING MANUAL	TECHNICIAN	FILM TYPE	FILM TECHNIQUE	MATERIAL	FILM VIEWING		WELDING PROCESS
																		DOUBLE	SINGLE	
WT-17	0-1	✓	✓	18	1	18		10 X 11 LOG	6"	6"	.10	0.020		F. K. R. 2	TYPE II KODAK	DOUBLE	CLB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WT-18	0-1	✓	✓	18	1	18		10 X 11 LOG	6"	6"	.10	0.020		F. K. R. 2	TYPE II KODAK	DOUBLE	CLB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WT-19	0-1	✓	✓	18	1	18		10 X 11 LOG	6"	6"	.10	0.020		F. K. R. 2	TYPE II KODAK	DOUBLE	CLB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WT-20	0-1	✓	✓	18	1	18		10 X 11 LOG	6"	6"	.10	0.020		F. K. R. 2	TYPE II KODAK	DOUBLE	CLB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WT-21	0-1	✓	✓	18	1	18		10 X 11 LOG	6"	6"	.10	0.020		F. K. R. 2	TYPE II KODAK	DOUBLE	CLB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WT-22	0-1	✓	✓	18	1	18		10 X 11 LOG	6"	6"	.10	0.020		F. K. R. 2	TYPE II KODAK	DOUBLE	CLB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WT-23	0-1	✓	✓	18	1	18		10 X 11 LOG	6"	6"	.10	0.020		F. K. R. 2	TYPE II KODAK	DOUBLE	CLB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WT-24	0-1	✓	✓	18	1	18		10 X 11 LOG	6"	6"	.10	0.020		F. K. R. 2	TYPE II KODAK	DOUBLE	CLB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



CODE KEY
 A - LACK OF PENET
 B - LACK OF FUSION
 C - CRACKS
 D - SLAG
 E - POROSITY
 F - UNDERCUT ROOT
 G - UNDERCUT CAP
 H - TUNGSTEN
 I - CONCAVITY CAP
 J - CONCAVITY ROOT
 K - WORM HOLE
 L - BURN THROUGH
 M - HOT TEAR
 N - PIN HOLE
 O - HIGH LOW



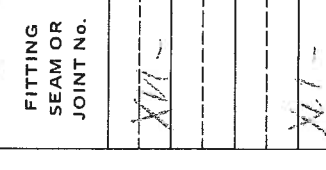
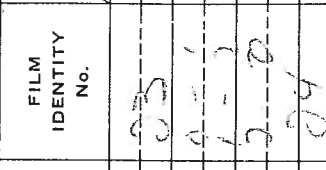
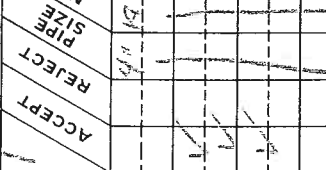
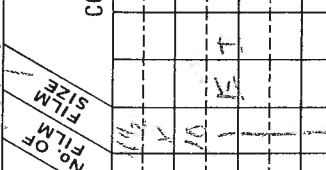
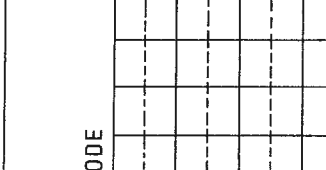
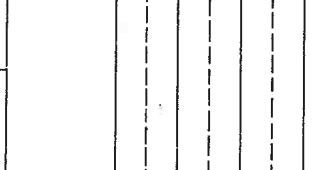
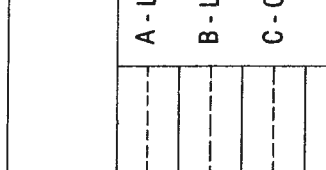
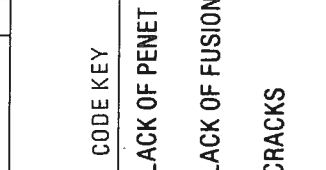
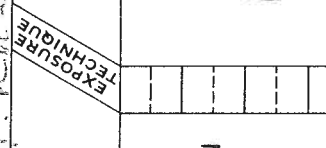
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RADIOGRAPHY PROCEDURE, RECORD AND REPORT FORM

AC JOB No. _____ DATE 4/20/02 PROCEDURE No. _____ PAGE _____ OF _____
 LICENSE No. 52-21350-01

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	DESCRIPTION	SCREEN THICKNESS		UNSHARPNESS	FILM PROCESSING MANUAL	TECHNICIAN	FILM VIEWING		WELDING PROCESS	TYPE II KODAK	FILM TOTAL	MATERIAL	
								LEAD	FRONT & BACK				DOUBLE	SINGLE					DOUBLE
XX-03							4"	0.020				F. K...							
XX-04							4"	0.020				F. K...							
XX-05							4"	0.020				F. K...							
XX-06							4"	0.020				F. K...							
XX-07							4"	0.020				F. K...							
XX-08							4"	0.020				F. K...							
XX-09							4"	0.020				F. K...							
XX-10							4"	0.020				F. K...							
XX-11							4"	0.020				F. K...							
XX-12							4"	0.020				F. K...							
XX-13							4"	0.020				F. K...							
XX-14							4"	0.020				F. K...							
XX-15							4"	0.020				F. K...							
XX-16							4"	0.020				F. K...							
XX-17							4"	0.020				F. K...							
XX-18							4"	0.020				F. K...							
XX-19							4"	0.020				F. K...							
XX-20							4"	0.020				F. K...							



EXPOSURE TECHNIQUE	SHOOTING SKETCH	TECHNIQUE A	TECHNIQUE B	TECHNIQUE C	TECHNIQUE D	TECHNIQUE E	TECHNIQUE F

EXPOSURE DEVICE B.1371 INTERPRETED BY [Signature] LEVEL III

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 3/05/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <u>Warley Intl.</u>	P.O. No.	DESCRIPTION <u>Navy Base 40000011 Road's Ceiba 7074-10</u>	MATERIAL <u>cs</u>
THICKNESS <u>3-20</u>	DIAMETER <u>8"</u>	CODE OR SPECIFICATION <u>API 1104</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
ISOPIPE IR-192	DIMENSIONS 10 X .11 LOG	CURIES <u>60</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
PROJECT JOB No. <u>Navy Base 40000011 Road's Ceiba 7074-10</u>	SCREENS LEAD DISTANCE <u>8"</u>	SCREEN THICKNESS .010 FRONT & BACK	WELDING PROCESS <input type="checkbox"/> AUTO <input type="checkbox"/> MAN
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	FILM PROCESSING MANUAL	FILM TOTAL
		UNSHARPNESS 0.020	TECHNICIAN <u>F. Kraus</u>
		TIME <u>0.73</u>	TYPE II KODAK

ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	
							PENETRATOR SIZE	SHOOTING SKETCH
		8"	11	11x	VP3-JPS	A - LACK OF PENET	TECHNIQUE A	TECHNIQUE B
		8"	11	11x		B - LACK OF FUSION		
		8"	11	11x		C - CRACKS		
		8"	11	11x		D - SLAG		
		8"	11	11x		E - POROSITY		
		8"	11	11x		F - UNDERCUT ROOT		
		8"	11	11x		G - UNDERCUT CAP		
		8"	11	11x		H - TUNGSTEN		
		8"	11	11x		I - CONCAVITY CAP		
		8"	11	11x		J - CONCAVITY ROOT		
		8"	11	11x		K - WORM HOLE		
		8"	11	11x		L - BURN THROUGH		
		8"	11	11x		M - HOT TEAR		
		8"	11	11x		N - PIN HOLE		
		8"	11	11x		O - HIGH LOW		

DIAGNOSTIC PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 5/10/86
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <i>Worley Int'l.</i>	P.O. No.	DESCRIPTION <i>Rec FAB Transfer line</i>	MATERIAL	FILM TECHNIQUE		FILM VIEWING	
				<input type="checkbox"/> DOUBLE	<input checked="" type="checkbox"/> SINGLE		
THICKNESS <i>.372</i>	DIAMETER <i>8"</i>	CODE OR SPECIFICATION <i>A1Z 1104</i>	SCREEN THICKNESS <i>.010</i>	UNSHARPNESS <i>0.020</i>	FILM TYPE	WELDING PROCESS	
ISOPOPE <i>IR-192</i>	DIMENSIONS <i>10 X .11 LOG</i>	CURIES <i>60</i>	LEAD <i>8"</i>	DISTANCE <i>8"</i>	TYPE II KODAK	<input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN	
PROJECT JOB NO. <i>7074-18</i>	FILM PROCESSING MANUAL	TECHNICIAN <i>F. K...</i>	FILM TOTAL	PENETRATOR SIZE			FILM SIDE
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	PIPE SIZE	SHOOTING SKETCH
<i>X11-34</i>	<i>34</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>8 1/2"</i>	<i>2</i>	<i>8 1/2"</i>	
<i>0-1</i>	<i>1</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>2-0</i>	<i>2</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>3-5</i>	<i>3</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>0-1</i>	<i>1</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>1-2</i>	<i>2</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>2-0</i>	<i>2</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>X11-36</i>	<i>36</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>8 1/2"</i>	<i>2</i>	<i>8 1/2"</i>	
<i>0-1</i>	<i>1</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>1-2</i>	<i>2</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>2-0</i>	<i>2</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>X11-37</i>	<i>37</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>8 1/2"</i>	<i>2</i>	<i>8 1/2"</i>	
<i>0-1</i>	<i>1</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>1-2</i>	<i>2</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	
<i>2-0</i>	<i>2</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<i>1 1/2"</i>	<i>1</i>	<i>1 1/2"</i>	

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____

DATE _____

PROCEDURE No. 52-21350-01

PAGE _____ OF _____

CLIENT 116 24 P.O. No. _____ MATERIAL 9/5

THICKNESS 300 DIAMETER _____ CODE OR SPECIFICATION _____ FILM THICKNESS .010 FRONT & BACK FILM TECHNIQUE DOUBLE SINGLE FILM VIEWING DOUBLE SINGLE

ISOPOPE IR-192 DIMENSIONS 10 X .11 LOG CURIES 7.37 UNSHARPNESS 0.020 TIME _____ FILM TYPE _____ WELDING PROCESS AUTO MAN

PROJECT JOB No. _____ FILM PROCESSING MANUAL MANUAL _____ TECHNICIAN J. H. 207 FILM TOTAL _____

FITTING SEAM OR JOINT No. _____

FILM IDENTITY No. 300A

ACCEPT _____ REJECT _____ PIPE SIZE _____ NO. OF FILM _____ FILM SIZE _____

SHOOTING SKETCH SOURCE SIDE FILM SIDE

PENETRATOR SIZE _____

DESCRIPTION	SCREENS LEAD DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	SCREEN THICKNESS	TYPE II KODAK	TECHNIQUE	EXPOSURE TECHNIQUE	CODE KEY	CODE	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE
A - LACK OF PENET									A - LACK OF PENET						
B - LACK OF FUSION									B - LACK OF FUSION						
C - CRACKS									C - CRACKS						
D - SLAG									D - SLAG						
E - POROSITY									E - POROSITY						
F - UNDERCUT ROOT									F - UNDERCUT ROOT						
G - UNDERCUT CAP									G - UNDERCUT CAP						
H - TUNGSTEN									H - TUNGSTEN						
I - CONCAVITY CAP									I - CONCAVITY CAP						
J - CONCAVITY ROOT									J - CONCAVITY ROOT						
K - WORM HOLE									K - WORM HOLE						
L - BURN THROUGH									L - BURN THROUGH						
M - HOT TEAR									M - HOT TEAR						
N - PIN HOLE									N - PIN HOLE						
O - HIGH LOW									O - HIGH LOW						

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR


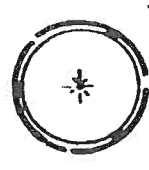
AC JOB No. _____ DATE 5/05/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT		P.O. No.		DESCRIPTION		MATERIAL		FILM TECHNIQUE		FILM VIEWING	
THICKNESS		DIAMETER		CODE OR SPECIFICATION		SCREEN THICKNESS		DOUBLE		DOUBLE	
ISOPOPE		DIMENSIONS		CURIES		LEAD		DISTANCE		TIME	
IR-192		10 X .11 LOG		60		12"		UNSHARPNESS		0.020	
PROJECT JOB No.		NAVY BASE ROOSEVELT		LOADS C-18A		7074-18		FILM PROCESSING		MANUAL	
FITTING SEAM OR JOINT No.		FILM IDENTITY No.		ACCEPT		REJECT		PIPE SIZE		NO. OF FILM	
				ACCEPT		REJECT		PIPE SIZE		NO. OF FILM	
X41	610	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓	VP-24-JPS-		
	0-1	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	1-2	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	2-0	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
X41	43	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	0-1	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	1-2	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	3-0	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
X41	44	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	0-1	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	1-2	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	2-0	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
X41	45	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	0-1	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	1-2	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	2-0	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
X41	46	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	0-1	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	1-2	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			
	2-0	✓	12" S 1/4	✓	12" S 1/4	✓	12" S 1/4	✓			

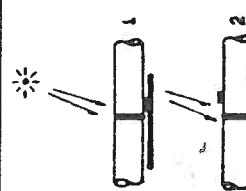
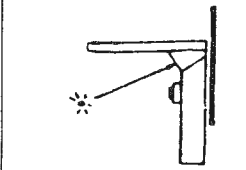
TECHNICIAN F. K. 22 FILM TOTAL 15

PENETRATOR SIZE 12 SOURCE SIDE FILM SIDE


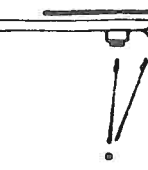
SHOOTING SKETCH

TECHNIQUE A

TECHNIQUE C

TECHNIQUE E

- CODE KEY
- A - LACK OF PENET
 - B - LACK OF FUSION
 - C - CRACKS
 - D - SLAG
 - E - POROSITY
 - F - UNDERCUT ROOT
 - G - UNDERCUT CAP
 - H - TUNGSTEN
 - I - CONCAVITY CAP
 - J - CONCAVITY ROOT
 - K - WORM HOLE
 - L - BURN THROUGH
 - M - HOT TEAR
 - N - PIN HOLE
 - O - HIGH LOW

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 5/20/02
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CLIENT <u>Waldy T. L. L.</u>	P.O. No.	DESCRIPTION <u>VPAS Tronstac Pipe</u>	MATERIAL <u>95</u>
THICKNESS <u>.237</u>	DIAMETER <u>1 1/4"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE IR-192	DIMENSIONS <u>10 X .11 LOG</u>	UNSHARPNESS <u>0.020</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No. <u>NAVY Base Roosevelt/Cmde Ceiba 7709R-18</u>	CURIES <u>60</u>	FILM PROCESSING MANUAL	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	TECHNICIAN <u>F. REVOL</u>	FILM TOTAL <u>6</u>

ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	DESCRIPTION	CODE KEY	EXPOSURE TECHNIQUE	
								PENETRATOR SIZE	SHOOTING SKETCH
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		A - LACK OF PENET		TECHNIQUE B
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		B - LACK OF FUSION		TECHNIQUE A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		C - CRACKS		TECHNIQUE C
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		D - SLAG		TECHNIQUE D
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		E - POROSITY		TECHNIQUE E
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		F - UNDERCUT ROOT		TECHNIQUE F
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		G - UNDERCUT CAP		TECHNIQUE A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		H - TUNGSTEN		TECHNIQUE B
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		I - CONCAVITY CAP		TECHNIQUE C
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		J - CONCAVITY ROOT		TECHNIQUE D
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		K - WORM HOLE		TECHNIQUE E
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		L - BURN THROUGH		TECHNIQUE F
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		M - HOT TEAR		TECHNIQUE A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		N - PIN HOLE		TECHNIQUE B
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>1 1/4"</u>	<u>10</u>	<u>10</u>	<u>VPAS-JPS</u>		O - HIGH LOW		TECHNIQUE C

ADIOGRAPHY PROCEDURE, RECORD AND REPORT FORM

AC JOB No. _____ DATE 5/16/02
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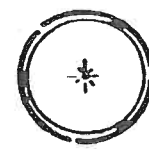

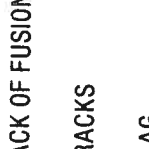
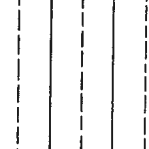
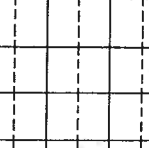
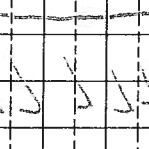
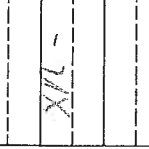
CLIENT <u>Worley Intl.</u>	P.O. No.	DESCRIPTION <u>Spool Tie in Weld Keppel</u>	MATERIAL <u>cks</u>
THICKNESS <u>.372</u>	DIAMETER <u>8"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	TIME <u>30</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	Welding Process	UNSHARPNESS <u>0.020</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		FILM PROCESSING MANUAL	TECHNICIAN <u>FRANZ</u>
			FILM TOTAL

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
<u>VP-5</u>	<u>JP-5</u>	<u>1</u>	<u>1</u>	<u>8"</u>	<u>1 1/2</u>	<u>1 1/2</u>		A - LACK OF PENET		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>CLAP</u>	<u>STR</u>	<u>1</u>	<u>1</u>	<u>8"</u>	<u>1 1/2</u>	<u>1 1/2</u>		B - LACK OF FUSION		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MT</u>	<u>STR</u>	<u>1</u>	<u>1</u>	<u>8"</u>	<u>1 1/2</u>	<u>1 1/2</u>		C - CRACKS		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>2-0</u>	<u>STR</u>	<u>1</u>	<u>1</u>	<u>8"</u>	<u>1 1/2</u>	<u>1 1/2</u>		D - SLAG		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								E - POROSITY		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								F - UNDERCUT ROOT		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								G - UNDERCUT CAP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								H - TUNGSTEN		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								I - CONCAVITY CAP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								J - CONCAVITY ROOT		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								K - WORM HOLE		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								L - BURN THROUGH		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								M - HOT TEAR		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								N - PIN HOLE		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
								O - HIGH LOW		<input type="checkbox"/>	<input checked="" type="checkbox"/>	

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 5/16/02
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CLIENT <u>Worley Intl.</u>	P.O. No.	DESCRIPTION <u>SPOOL tip in VR24 JPS line</u>	MATERIAL <u>CLS</u>
THICKNESS <u>.365</u>	DIAMETER <u>12"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	TIME <u>1:00</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>56.7</u>	UNSHARPNESS <u>0.020</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
	<u>Navy Base Coiba</u>	FILM PROCESSING MANUAL	FILM TOTAL <u>21</u>

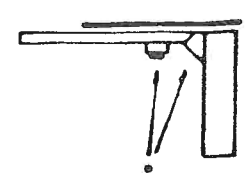
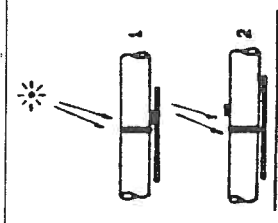
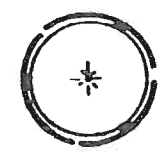
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
									<input type="checkbox"/> SOURCE SIDE	<input checked="" type="checkbox"/> FILM SIDE	
<u>XM-0-1</u>	<u>5-2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>10" DIA</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-1-2</u>	<u>1-2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-2-0</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-3-4</u>	<u>0-1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-4-1</u>	<u>1-2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-5-6</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-6-5</u>	<u>0-1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-7-0</u>	<u>1-2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-8-1</u>	<u>0-1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-9-2</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-10-1</u>	<u>0-1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>F</u>		<u>A</u>	<u>1</u>	<u>2</u>	
<u>XM-11-0</u>	<u>5-8</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>L</u>		<u>C</u>	<u>1</u>	<u>2</u>	
<u>XM-12-4</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>L</u>		<u>C</u>	<u>1</u>	<u>2</u>	
<u>XM-13-0</u>	<u>5-9</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>L</u>		<u>C</u>	<u>1</u>	<u>2</u>	
<u>XM-14-1</u>	<u>0-1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>L</u>		<u>C</u>	<u>1</u>	<u>2</u>	
<u>XM-15-3</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>14</u>	<u>L</u>		<u>C</u>	<u>1</u>	<u>2</u>	

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/1/92 PROCEDURE No. 52-21350-01 PAGE 2 OF 2

CLIENT <u>Workley 7466</u>		P.O. No.		DESCRIPTION <u>Transmission Top in bolts</u>		MATERIAL <u>stc</u>	
THICKNESS <u>3/32</u>	DIAMETER <u>1/4"</u>	CODE OR SPECIFICATION <u>ASTM A193</u>		SCREENS <u>10"</u>	LEAD <u>10"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS <u>10 X .11 LOG</u>	CURIES <u>44</u>		TIME <u>1:00</u>	UNSHARPNESS <u>0.020</u>	FILM TYPE <u>KODAK</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input type="checkbox"/> MAN
PROJECT JOB No.		FILM PROCESSING MANUAL		FILM PROCESSING MANUAL		FILM TOTAL	
FITTING SEAM OR JOINT No.		FILM IDENTITY No.		TECHNICIAN <u>F. K...</u>		EXPOSURE TECHNIQUE	
VP-56-DMP		1-2		ACCEPT		PENETRATOR SIZE <input type="checkbox"/> SOURCE SIDE <input type="checkbox"/> FILM SIDE	
Xtt-9772		1-2		REJECT		SHOOTING SKETCH	
1-2		1-2		NO OF FILM SIZE		TECHNIQUE A	
Xtt-997A		1-2		REJECT		TECHNIQUE B	
1-2		1-2		NO OF FILM SIZE		TECHNIQUE C	
				REJECT		TECHNIQUE D	
				REJECT		TECHNIQUE E	
				REJECT		TECHNIQUE F	

- CODE KEY**
- A - LACK OF PENET
 - B - LACK OF FUSION
 - C - CRACKS
 - D - SLAG
 - E - POROSITY
 - F - UNDERCUT ROOT
 - G - UNDERCUT CAP
 - H - TUNGSTEN
 - I - CONCAVITY CAP
 - J - CONCAVITY ROOT
 - K - WORM HOLE
 - L - BURN THROUGH
 - M - HOT TEAR
 - N - PIN HOLE
 - O - HIGH LOW



EXPOSURE DEVICE 1374 INTERPRETED BY [Signature] LEVEL III

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 5/16/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <u>Wabco Int'l.</u>	P.O. No.	DESCRIPTION <u>Spool tie in</u>	MATERIAL <u>c/s</u>
THICKNESS <u>365</u>	DIAMETER <u>10"</u>	CODE OR SPECIFICATION <u>API 1104</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS <u>10 X 11 LOG</u>	CURIES <u>56.7</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
PROJECT JOB No.	LEAD <u>1/2"</u>	UNSHARPNESS <u>0.020</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input type="checkbox"/> MAN
	SCREEN THICKNESS <u>.010</u>	TIME <u>1:00</u>	TYPE II KODAK
	SCREENS	FILM PROCESSING MANUAL	FILM TOTAL
	LEAD		TECHNICIAN <u>F. Krum 2</u>
	DISTANCE		

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	No. OF FILM	FILM SIZE	CODE	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
									SOURCE SIDE	FILM SIDE	
X11-60	0-1	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-61	0-2	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-62	0-3	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-63	0-4	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-64	0-5	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-65	0-6	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-66	0-7	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-67	0-8	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-68	0-9	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-69	0-10	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-70	0-11	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-71	0-12	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-72	0-13	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-73	0-14	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-74	0-15	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-75	0-16	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-76	0-17	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-77	0-18	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-78	0-19	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-79	0-20	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-80	0-21	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-81	0-22	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-82	0-23	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-83	0-24	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-84	0-25	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-85	0-26	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-86	0-27	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-87	0-28	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-88	0-29	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-89	0-30	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-90	0-31	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-91	0-32	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-92	0-33	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-93	0-34	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-94	0-35	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-95	0-36	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-96	0-37	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-97	0-38	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-98	0-39	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-99	0-40	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X11-100	0-41	✓		10" 10 1/4"	1	10 1/4"	LED	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

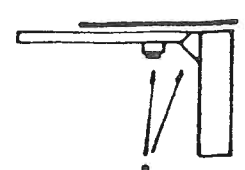
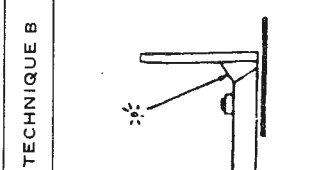
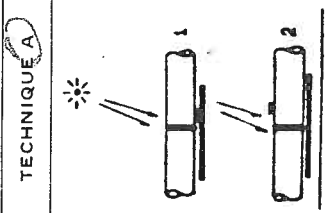
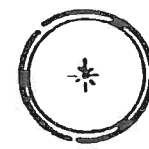
RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOI

AC JOB No. _____ DATE 5/16/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <i>Workley Zintl</i>	P.O. No.	DESCRIPTION <i>VP-4 Spool Train</i>	MATERIAL <i>cb</i>	SCREEN THICKNESS		FILM TECHNIQUE		FILM VIEWING
				FRONT	BACK	DOUBLE	SINGLE	
THICKNESS <i>.322</i>	DIAMETER <i>8"</i>	LEAD	TYPE II KODAK	UNSHARPNESS	TIME	WELDING PROCESS	TYPE I	TYPE II
ISOPE <i>IR-192</i>	DIMENSIONS <i>10 X .11 LOG</i>	DISTANCE <i>8"</i>	TECHNICIAN <i>F. Ruiz</i>	0.020	.30	AUTO	MAN	FILM TOTAL
PROJECT JOB No.	FILM PROCESSING	FILM PROCESSING	FILM TOTAL	MANUAL	MANUAL	MANUAL	MANUAL	FILM TOTAL
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY
<i>X-1-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		A - LACK OF PENETRATION
<i>0-1-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		B - LACK OF FUSION
<i>0-2-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		C - CRACKS
<i>0-3-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		D - SLAG
<i>0-4-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		E - POROSITY
<i>0-5-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		F - UNDERCUT ROOT
<i>0-6-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		G - UNDERCUT CAP
<i>0-7-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		H - TUNGSTEN
<i>0-8-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		I - CONCAVITY CAP
<i>0-9-64</i>	<i>64</i>	<i>✓</i>	<i>✓</i>	<i>8"</i>	<i>6</i>	<i>4x4</i>		J - CONCAVITY ROOT
								K - WORM HOLE
								L - BURN THROUGH
								M - HOT TEAR
								N - PIN HOLE
								O - HIGH LOW

EXPOSURE TECHNIQUE

PENETRATOR SIZE
 SOURCE SIDE
 FILM SIDE
 SHOOTING SKETCH



EXPOSURE DEVICE B 1374 INTERPRETED BY _____ LEVEL III

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 5/28/12
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE 1 OF 1

CLIENT Whitely Inst. P.O. No. _____ MATERIAL C/S
 THICKNESS _____ DIAMETER 3" CODE OR SPECIFICATION ABT 1104
 ISOPOPE IR-192 DIMENSIONS 10 X .11 LOG CURIES _____
 PROJECT JOB No. Navy BARB TECHNICIAN J. Rivera FILM TOTAL 21
 SCREENS 15 LEAD 0.020 UNSHARPNESS 0.020 FILM PROCESSING MANUAL
 SCREEN THICKNESS .010 FRONT & BACK _____
 FILM TYPE DOUBLE FILM VIEWING DOUBLE
 TYPE II KODAK _____ WELDING PROCESS AUTO
 TYPE II KODAK _____ WELDING PROCESS MAN

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT / REJECT			PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE	SHOOTING SKETCH	
		ACCEPT	REJECT	SOURCE SIDE								FILM SIDE	
VP-24-DFM	1-1	✓		12"	2	11"	D	A - LACK OF PENET	TECHNIQUE A	17			
XII-666	1-2	✓		12"	2	11"	D	B - LACK OF FUSION	TECHNIQUE A	17			
XII-67	1-2	✓		12"	2	11"	D	C - CRACKS	TECHNIQUE A	17			
XII-68	1-2	✓		12"	2	11"	D	D - SLAG	TECHNIQUE A	17			
XII-69	1-2	✓		12"	2	11"	D	E - POROSITY	TECHNIQUE A	17			
XII-70	1-2	✓		12"	2	11"	D	F - UNDERCUT ROOT	TECHNIQUE A	17			
XII-71	1-2	✓		12"	2	11"	D	G - UNDERCUT CAP	TECHNIQUE A	17			
XII-72	1-2	✓		12"	2	11"	D	H - TUNGSTEN	TECHNIQUE A	17			
XII-73	1-2	✓		12"	2	11"	D	I - CONCAVITY CAP	TECHNIQUE A	17			
XII-74	1-2	✓		12"	2	11"	D	J - CONCAVITY ROOT	TECHNIQUE A	17			
XII-75	1-2	✓		12"	2	11"	D	K - WORM HOLE	TECHNIQUE A	17			
XII-76	1-2	✓		12"	2	11"	D	L - BURN THROUGH	TECHNIQUE A	17			
XII-77	1-2	✓		12"	2	11"	D	M - HOT TEAR	TECHNIQUE A	17			
XII-78	1-2	✓		12"	2	11"	D	N - PIN HOLE	TECHNIQUE A	17			
XII-79	1-2	✓		12"	2	11"	D	O - HIGH LOW	TECHNIQUE A	17			

EXPOSURE DEVICE B-1344 INTERPRETED BY [Signature] LEVEL III

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 5/26/62
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT		P.O. No.		DESCRIPTION		MATERIAL			
THICKNESS	DIAMETER	CODE OR SPECIFICATION	SCREEN THICKNESS	FILM TECHNIQUE	FILM VIEWING	FILM TYPE	WELDING PROCESS		
ISOPOPE	DIMENSIONS	CURIES	TIME	UNSHARPNESS	TYPE II KODAK	FILM TOTAL	TECHNICIAN		
IR-192	10 X .11 LOG	50.7	1.00	0.020			<u>21</u>		
PROJECT JOB No.		FILM PROCESSING MANUAL		TECHNICIAN		FILM TOTAL			
<u>Naval Base P.R.</u>				<u>R. K. ...</u>		<u>21</u>			
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE
<u>VP-24-DEM</u>				<u>12.25" DIA</u>					
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>A - LACK OF PENET</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>B - LACK OF FUSION</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>C - CRACKS</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>D - SLAG</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>E - POROSITY</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>F - UNDERCUT ROOT</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>G - UNDERCUT CAP</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>H - TUNGSTEN</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>I - CONCAVITY CAP</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>J - CONCAVITY ROOT</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>K - WORM HOLE</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>L - BURN THROUGH</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>M - HOT TEAR</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>N - PIN HOLE</u>	
<u>X11-0-3</u>	<u>0-3</u>	<input checked="" type="checkbox"/>		<u>14</u>	<u>14</u>	<u>E</u>		<u>O - HIGH LOW</u>	

EXPOSURE DEVICE B-1374 INTERPRETED BY _____ LEVEL III



LONSO & CARUS
 iron works inc.
 P.O. BOX 566 - CATANO, PUERTO RICO 00963
 TELEPHONE: (787) 788-1065
 FAX: (787) 788-0350

DIAGNOSTIC RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 05/28/12
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <u>Worley Int'l.</u>	P.O. No.	DESCRIPTION <u>Mech. Trans. Fuel</u>	MATERIAL <u>CL</u>
THICKNESS <u>375/300</u>	DIAMETER <u>10 1/2"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOFOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>10 1/2"</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No. <u>Navy Base Proj.</u>	CURIES <u>50.7</u>	DISTANCE <u>10 1/2"</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		TIME <u>100/20</u>	UNSHARPNESS <u>0.020</u>
		FILM PROCESSING MANUAL	TECHNICIAN <u>F. Kranz</u>
			FILM TOTAL <u>12</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	SHOOTING SKETCH	
										<input type="checkbox"/> SOURCE SIDE	<input type="checkbox"/> FILM SIDE
<u>VP-56-DFM</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		A - LACK OF PENET			TECHNIQUE B
<u>XII-80</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		B - LACK OF FUSION			TECHNIQUE A
<u>9-1</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		C - CRACKS			TECHNIQUE B
<u>1-2</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		D - SLAG			TECHNIQUE B
<u>2-0</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		E - POROSITY			TECHNIQUE B
<u>XII-81</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		F - UNDERCUT ROOT			TECHNIQUE B
<u>0-1</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		G - UNDERCUT CAP			TECHNIQUE B
<u>1-2</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		H - TUNGSTEN			TECHNIQUE B
<u>XII-82</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		I - CONCAVITY CAP			TECHNIQUE B
<u>0-1</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		J - CONCAVITY ROOT			TECHNIQUE B
<u>XII-83</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		K - WORM HOLE			TECHNIQUE B
<u>0-1</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		L - BURN THROUGH			TECHNIQUE B
<u>1-2</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		M - HOT TEAR			TECHNIQUE B
<u>0-0</u>		<input checked="" type="checkbox"/>		<u>12"</u>	<u>12</u>	<u>12"</u>		N - PIN HOLE			TECHNIQUE B
								O - HIGH LOW			TECHNIQUE B

EXPOSURE DEVICE B-1374 INTERPRETED BY [Signature] LEVEL _____

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE _____
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT	P.O. No.	DESCRIPTION	SCREENS		LEAD	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	FILM TECHNIQUE		MATERIAL	
			IR-192	DOUBLE						SINGLE	FILM VIEWING		
PROJECT JOB No.		DIMENSIONS		CURIES		FILM PROCESSING		FILM TYPE		FILM TOTAL		TECHNICIAN	
IR-192		10 X .11 LOG		46		MANUAL		TYPE II KODAK		2			F. K...
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	DIAMETER	CODE OR SPECIFICATION	ACCEPT		REJECT		PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	
				ACCEPT	REJECT	ACCEPT	REJECT						
XL-8112		8"	AP-104			12"	17	VP-56-Pr				A - LACK OF PENET	TECHNIQUE A
0-1												B - LACK OF FUSION	TECHNIQUE B
XL-8112												C - CRACKS	TECHNIQUE C
0-2												D - SLAG	TECHNIQUE D
												E - POROSITY	TECHNIQUE E
												F - UNDERCUT ROOT	TECHNIQUE F
												G - UNDERCUT CAP	TECHNIQUE G
												H - TUNGSTEN	TECHNIQUE H
												I - CONCAVITY CAP	TECHNIQUE I
												J - CONCAVITY ROOT	TECHNIQUE J
												K - WORM HOLE	TECHNIQUE K
												L - BURN THROUGH	TECHNIQUE L
												M - HOT TEAR	TECHNIQUE M
												N - PIN HOLE	TECHNIQUE N
												O - HIGH LOW	TECHNIQUE O

Repairs

Moxy Paul Pic.


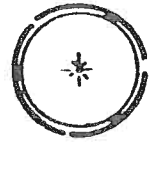
CLIENT Worley Intl. P.O. No. _____ MATERIAL cb
 THICKNESS .375 DIAMETER 12" CODE OR SPECIFICATION APT 1104
 ISOPE IR-192 DIMENSIONS 10 X .11 LOG CURIES 47.4 SCREEN THICKNESS .010 FRONT & BACK FILM TECHNIQUE DOUBLE SINGLE FILM VIEWING DOUBLE SINGLE
 LEAD 12" DISTANCE 12" UNSHARPNESS 0.020 TIME 1:50 TYPE II KODAK AUTO MAN
 PROJECT JOB No. Navv Base Proj. VP-24-DFM FILM PROCESSING MANUAL F. Krauz TECHNICIAN F. Krauz FILM TOTAL _____

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	No OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE	SHOOTING SKETCH	
											<input type="checkbox"/> SOURCE SIDE	<input type="checkbox"/> FILM SIDE
<u>VP-24-DFM</u>	<u>84</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>A - LACK OF PENET</u>	<u>TECHNIQUE A</u>	<u>17</u>		
<u>85</u>	<u>1-2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>B - LACK OF FUSION</u>	<u>TECHNIQUE B</u>	<u>17</u>		
<u>86</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>C - CRACKS</u>	<u>TECHNIQUE C</u>	<u>17</u>		
<u>87</u>	<u>0-1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>D - SLAG</u>	<u>TECHNIQUE D</u>	<u>17</u>		
<u>88</u>	<u>1-2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>E - POROSITY</u>	<u>TECHNIQUE E</u>	<u>17</u>		
<u>89</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>F - UNDERCUT ROOT</u>	<u>TECHNIQUE F</u>	<u>17</u>		
<u>90</u>	<u>0-1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>G - UNDERCUT CAP</u>	<u>TECHNIQUE G</u>	<u>17</u>		
<u>91</u>	<u>1-2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>H - TUNGSTEN</u>	<u>TECHNIQUE H</u>	<u>17</u>		
<u>92</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>I - CONCAVITY CAP</u>	<u>TECHNIQUE I</u>	<u>17</u>		
<u>93</u>	<u>0-1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>J - CONCAVITY ROOT</u>	<u>TECHNIQUE J</u>	<u>17</u>		
<u>94</u>	<u>1-2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>K - WORM HOLE</u>	<u>TECHNIQUE K</u>	<u>17</u>		
<u>95</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>L - BURN THROUGH</u>	<u>TECHNIQUE L</u>	<u>17</u>		
<u>96</u>	<u>0-1</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>M - HOT TEAR</u>	<u>TECHNIQUE M</u>	<u>17</u>		
<u>97</u>	<u>1-2</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>N - PIN HOLE</u>	<u>TECHNIQUE N</u>	<u>17</u>		
<u>98</u>	<u>2-0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>12"</u>	<u>17</u>	<u>17</u>	<u>17</u>	<u>O - HIGH LOW</u>	<u>TECHNIQUE O</u>	<u>17</u>		

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/20/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <u>Workley Intl.</u>	P.O. No.	DESCRIPTION <u>Spool Ties Welds</u>	MATERIAL <u>clb</u>
THICKNESS <u>1/2"</u>	DIAMETER <u>1/2"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>1/2"</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>47-d</u>	TIME <u>150</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
<u>Aling Base 800</u>	<u>VP-20-DCM</u>	UNSHARPNESS <u>0.020</u>	TYPE II KODAK
FILM IDENTITY No.	FILM PROCESSING MANUAL	FILM TOTAL	TECHNICIAN <u>R. K. 2</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	EXPOSURE TECHNIQUE		CODE KEY	TECHNIQUE
								PENETRATOR SIZE	SOURCE SIDE		
<u>VP-20-DCM</u>											
<u>88</u>											
<u>9-2</u>											
<u>2-0</u>											
<u>89</u>											
<u>0-1</u>											
<u>1-2</u>											
<u>2-0</u>											
<u>90</u>											
<u>0-1</u>											
<u>2-0</u>											
<u>91</u>											
<u>0-1</u>											
<u>2-0</u>											



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ADIOPHOTOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/04/02
LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <u>Morley Int'l</u>	P.O. No.	DESCRIPTION <u>Spool Tie in Welds</u>	MATERIAL <u>CS</u>
THICKNESS <u>1/4"</u>	DIAMETER <u>6"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>6"</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>47.4</u>	DISTANCE <u>6"</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		TIME <u>1:50</u>	UNSHARPNESS <u>0.020</u>
		FILM PROCESSING MANUAL	FILM TOTAL <u>9</u>
		FILM PROCESSING MANUAL	TECHNICIAN <u>F. K. R. 2</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT / REJECT			CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE	SOURCE SIDE	FILM SIDE	SHOOTING SKETCH
		ACCEPT	REJECT	NO. OF FILM SIZE							
<u>VP-56 DF#</u>						A - LACK OF PENET					
<u>XU-92</u>						B - LACK OF FUSION					
<u>XU-93</u>						C - CRACKS					
<u>XU-94</u>						D - SLAG					
<u>XU-95</u>						E - POROSITY					
<u>XU-96</u>						F - UNDERCUT ROOT					
<u>XU-97</u>						G - UNDERCUT CAP					
<u>XU-98</u>						H - TUNGSTEN					
<u>XU-99</u>						I - CONCAVITY CAP					
<u>XU-100</u>						J - CONCAVITY ROOT					
						K - WORM HOLE					
						L - BURN THROUGH					
						M - HOT TEAR					
						N - PIN HOLE					
						O - HIGH LOW					

EXPOSURE DEVICE B-1374 INTERPRETED BY _____ LEVEL III

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FORM

AC JOB No. _____ DATE 6/6/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT	THICKNESS	DIAMETER	CODE OR SPECIFICATION	CURIES	DISTANCE	LEAD	SCREENS	DESCRIPTION	MATERIAL	FILM VIEWING		WELDING PROCESS	FILM TOTAL
										DOUBLE	SINGLE		
ISOPOPE	DIMENSIONS		FILM PROCESSING		UNSHARPNESS		FILM TYPE		TYPE II KODAK		AUTO	MAN	
IR-192	10 X .11 LOG		MANUAL		0.020		F-100		F-100		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
PROJECT JOB No.	Merry Base Proj.		Repair		6"		Kodak		F-100		1		
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	PIPE SIZE	NO OF FILM	CODE	CODE KEY	EXPOSURE TECHNIQUE			
VP-56-Df64				6" L 1 1/2	1				A - LACK OF PENET		TECHNIQUE A		
X1-0412				10"	1				B - LACK OF FUSION		TECHNIQUE B		
1-2				10"	1				C - CRACKS		TECHNIQUE C		
				10"	1				D - SLAG		TECHNIQUE D		
				10"	1				E - POROSITY		TECHNIQUE E		
				10"	1				F - UNDERCUT ROOT		TECHNIQUE F		
				10"	1				G - UNDERCUT CAP		TECHNIQUE G		
				10"	1				H - TUNGSTEN		TECHNIQUE H		
				10"	1				I - CONCAVITY CAP		TECHNIQUE I		
				10"	1				J - CONCAVITY ROOT		TECHNIQUE J		
				10"	1				K - WORM HOLE		TECHNIQUE K		
				10"	1				L - BURN THROUGH		TECHNIQUE L		
				10"	1				M - HOT TEAR		TECHNIQUE M		
				10"	1				N - PIN HOLE		TECHNIQUE N		
				10"	1				O - HIGH LOW		TECHNIQUE O		

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/24/02
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CLIENT <u>Warley Intl.</u>	P.O. No.	DESCRIPTION <u>Spool Tie in Weld</u>	MATERIAL
THICKNESS <u>1/2"</u>	DIAMETER <u>8"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>8"</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>47-4</u>	TIME <u>:40</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		UNSHARPNESS <u>0.020</u>	TYPE II KODAK
		FILM PROCESSING MANUAL	FILM TOTAL <u>3</u>
			TECHNICIAN <u>F. K...</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
<u>VP-24-DFM</u>				<u>8"</u>	<u>3</u>	<u>4x4</u>						
<u>XM-95</u>								<u>A - LACK OF PENET</u>	<u>TECHNIQUE A</u>			
<u>0-1</u>								<u>B - LACK OF FUSION</u>				
<u>1-2</u>								<u>C - CRACKS</u>				
<u>2-0</u>								<u>D - SLAG</u>				
								<u>E - POROSITY</u>				
								<u>F - UNDERCUT ROOT</u>				
								<u>G - UNDERCUT CAP</u>				
								<u>H - TUNGSTEN</u>				
								<u>I - CONCAVITY CAP</u>				
								<u>J - CONCAVITY ROOT</u>				
								<u>K - WORM HOLE</u>				
								<u>L - BURN THROUGH</u>				
								<u>M - HOT TEAR</u>				
								<u>N - PIN HOLE</u>				
								<u>O - HIGH LOW</u>				

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOF

AC JOB No. _____ DATE 6/16/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	DESCRIPTION	SCREENS LEAD	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	FILM TECHNIQUE		FILM VIEWING	WELDING PROCESS	TYPE II KODAK	FILM TOTAL	TECHNICIAN	MATERIAL
														DOUBLE	SINGLE						
VP-56-DEM				12" 12 1/4"	17	17		10 X 11 LOG	13 1/2"	18"	1:50	0.020	.010	DOUBLE	SINGLE	DOUBLE	AUTO			F. R. R. 2	ELF
XVI-96		✓																			
XVI-97		✓																			
XVI-98		✓																			
XVI-99		✓																			
XVI-100		✓																			

CODE KEY	EXPOSURE TECHNIQUE	SHOOTING SKETCH	TECHNIQUE
A - LACK OF PENET			TECHNIQUE A
B - LACK OF FUSION			TECHNIQUE B
C - CRACKS			TECHNIQUE C
D - SLAG			TECHNIQUE D
E - POROSITY			TECHNIQUE E
F - UNDERCUT ROOT			TECHNIQUE F
G - UNDERCUT CAP			
H - TUNGSTEN			
I - CONCAVITY CAP			
J - CONCAVITY ROOT			
K - WORM HOLE			
L - BURN THROUGH			
M - HOT TEAR			
N - PIN HOLE			
O - HIGH LOW			

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/06/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <i>Workley Tank</i>	P.O. No.	DESCRIPTION <i>Welding line Tie In Welds</i>	MATERIAL <i>etc</i>	SCREEN THICKNESS		FILM TECHNIQUE		FILM VIEWING				
				LEAD	TIME	DOUBLE	SINGLE	DOUBLE	SINGLE			
THICKNESS <i>3/8"</i>	DIAMETER <i>12"</i>	CODE OR SPECIFICATION <i>API 1104</i>	TYPE II KODAK	UNSHARPNESS	WELDING PROCESS	FILM TYPE		FILM TOTAL				
ISOPE IR-192	DIMENSIONS 10 X .11 LOG	CURIES <i>44</i>	TECHNICIAN <i>F. K... 2</i>	0.020	AUTO	TYPE II KODAK		FILM TOTAL				
PROJECT JOB No.	FILM PROCESSING MANUAL		FILM PROCESSING MANUAL		FILM PROCESSING MANUAL		FILM PROCESSING MANUAL		FILM PROCESSING MANUAL			
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE		CODE KEY	EXPOSURE TECHNIQUE		
							PIPE SIZE	NO. OF FILM				
<i>TRAP-1982</i>				<i>12.5"</i>	<i>4</i>	<i>10"</i>				<i>10</i>		TECHNIQUE A
<i>117-100</i>												TECHNIQUE B
<i>0-1</i>	<i>✓</i>											TECHNIQUE C
<i>0-2</i>	<i>✓</i>											TECHNIQUE D
<i>0-0</i>	<i>✓</i>											TECHNIQUE E
<i>104</i>												TECHNIQUE F
<i>0-1</i>	<i>✓</i>											TECHNIQUE A
<i>0-2</i>	<i>✓</i>											TECHNIQUE B
<i>0-0</i>	<i>✓</i>											TECHNIQUE C

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/20/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <u>WOLBY - JLC</u>	P.O. No.	DESCRIPTION <u>Trasporte de los Troncos</u>	MATERIAL <u>Stl</u>
THICKNESS <u>3/4"</u>	DIAMETER <u>16"</u>	SCREENS LEAD DISTANCE <u>16"</u>	SCREEN THICKNESS .010 FRONT & BACK UNSHARPNESS 0.020
ISOPOPE IR-192	DIMENSIONS 10 X .11 LOG	CURIES <u>44</u>	FILM TYPE TYPE II KODAK TECHNICIAN <u>F. Riaz</u>
PROJECT JOB No.	<u>NAVY Base P.R. Canal</u>	FILM PROCESSING MANUAL	FILM TOTAL <u>16</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT / REJECT			CODE	CODE KEY	EXPOSURE TECHNIQUE
		ACCEPT	REJECT	PIPE SIZE			
<u>TRAP-1222</u>				<u>16" 16 4/13</u>			
<u>XRT-101</u>				<u>17</u>			
<u>0-1</u>	<u>1</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>2-3</u>	<u>3</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>3-0</u>	<u>0</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>XRT-102</u>							
<u>0-1</u>	<u>1</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>1-2</u>	<u>2</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>2-3</u>	<u>3</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>3-0</u>	<u>0</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>XRT-105</u>							
<u>0-1</u>	<u>1</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>1-2</u>	<u>2</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>2-3</u>	<u>3</u>	<input checked="" type="checkbox"/>		<u>E</u>			
<u>3-0</u>	<u>0</u>	<input checked="" type="checkbox"/>		<u>E</u>			

- CODE KEY**
- A - LACK OF PENET
 - B - LACK OF FUSION
 - C - CRACKS
 - D - SLAG
 - E - POROSITY
 - F - UNDERCUT ROOT
 - G - UNDERCUT CAP
 - H - TUNGSTEN
 - I - CONCAVITY CAP
 - J - CONCAVITY ROOT
 - K - WORM HOLE
 - L - BURN THROUGH
 - M - HOT TEAR
 - N - PIN HOLE
 - O - HIGH LOW

		TECHNIQUE A
		TECHNIQUE B
		TECHNIQUE C
		TECHNIQUE D
		TECHNIQUE E
		TECHNIQUE F

AC JOB No.

DATE

6/07/02

LICENSE No. 52-21350-01

PROCEDURE No.

PAGE

OF


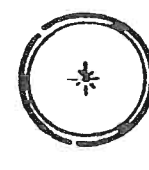
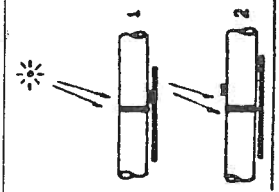
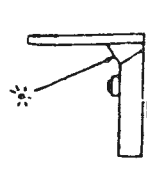

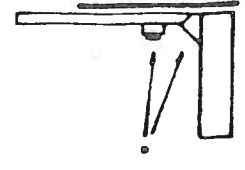
CLIENT <i>Workshop Tull.</i>	P.O. No.		MATERIAL <i>Stk</i>	
	THICKNESS <i>375</i>	DIAMETER <i>10"</i>	CODE OR SPECIFICATION <i>APT-1104</i>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS 10 X .11 LOG	CURIES <i>45-3</i>	SCREEN THICKNESS .010 FRONT & BACK	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.		DISTANCE <i>12"</i>	TIME <i>1.00</i>	UNSHARPNESS 0.020
			FILM PROCESSING MANUAL	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
FILM IDENTITY No.		TECHNICIAN <i>K-K...</i>		
FITTING SEAM OR JOINT No.		FILM TOTAL <i>6</i>		
ACCEPT REJECT PIPE SIZE NO. OF FILM SIZE		PENETRATOR SIZE <input type="checkbox"/> SOURCE SIDE <input checked="" type="checkbox"/> FILM SIDE		
SHOOTING SKETCH		EXPOSURE TECHNIQUE		
CODE		CODE KEY		
A - LACK OF PENET		B - LACK OF FUSION		
C - CRACKS		D - SLAG		
E - POROSITY		F - UNDERCUT ROOT		
G - UNDERCUT CAP		H - TUNGSTEN		
I - CONCAVITY CAP		J - CONCAVITY ROOT		
K - WORM HOLE		L - BURN THROUGH		
M - HOT TEAR		N - PIN HOLE		
O - HIGH LOW				
TECHNIQUE A		TECHNIQUE B		
TECHNIQUE C		TECHNIQUE D		
TECHNIQUE E		TECHNIQUE F		

EXPOSURE DEVICE B 1374 INTERPRETED BY [Signature] LEVEL III

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/24/12
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE 1 OF 1

CLIENT <u>Water Key 2016</u>	P.O. No.	DESCRIPTION <u>Boiler Area Repair Weld</u>	MATERIAL <u>sk</u>
THICKNESS <u>5/16"</u>	DIAMETER <u>8"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>8"</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>40</u>	UNSHARPNESS <u>0.020</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		FILM PROCESSING MANUAL	TYPE II KODAK FILM TOTAL
			TECHNICIAN <u>F. K...</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	DESCRIPTION	CODE KEY	EXPOSURE TECHNIQUE		
										<input type="checkbox"/> SOURCE SIDE	<input type="checkbox"/> FILM SIDE	
<u>Boiler Area</u>				<u>5 1/4"</u>	<u>1</u>	<u>11x14</u>		<u>Repair</u>			 TECHNIQUE A	 TECHNIQUE B
<u>WT 108-D</u>				<u>1 1/2"</u>	<u>1</u>	<u>11x14</u>					 TECHNIQUE C	 TECHNIQUE D
											 TECHNIQUE E	 TECHNIQUE F

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/07/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <u>Worley Int'l.</u>	P.O. No.	DESCRIPTION <u>5000 Tie in Welds</u>	MATERIAL <u>eb</u>
THICKNESS <u>3/8</u>	DIAMETER <u>12"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	TIME <u>1:00</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>45.3</u>	UNSHARPNESS <u>0.020</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
	<u>Alloy Bass Ciba</u>	FILM PROCESSING MANUAL	FILM TOTAL
		TECHNICIAN <u>R. K. ...</u>	

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
DFM-58				12" x 18" H/B	1	4x5		A - LACK OF PENET	TECHNIQUE A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-109				12"	1	4x5		B - LACK OF FUSION	TECHNIQUE B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-110				12"	1	4x5		C - CRACKS	TECHNIQUE C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-111				12"	1	4x5		D - SLAG	TECHNIQUE D	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-112				12"	1	4x5		E - POROSITY	TECHNIQUE E	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-113				12"	1	4x5		F - UNDERCUT ROOT	TECHNIQUE F	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-114				12"	1	4x5		G - UNDERCUT CAP	TECHNIQUE G	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-115				12"	1	4x5		H - TUNGSTEN	TECHNIQUE H	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-116				12"	1	4x5		I - CONCAVITY CAP	TECHNIQUE I	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-117				12"	1	4x5		J - CONCAVITY ROOT	TECHNIQUE J	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-118				12"	1	4x5		K - WORM HOLE	TECHNIQUE K	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-119				12"	1	4x5		L - BURN THROUGH	TECHNIQUE L	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-120				12"	1	4x5		M - HOT TEAR	TECHNIQUE M	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-121				12"	1	4x5		N - PIN HOLE	TECHNIQUE N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
X1-122				12"	1	4x5		O - HIGH LOW	TECHNIQUE O	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB NO. _____ DATE 6/20/02
 LICENSE NO. 52-21350-01 PROCEDURE NO. _____ PAGE _____ OF _____

CLIENT <u>Worley Ind.</u>	P.O. No.	DESCRIPTION <u>Spool tip in Wldg</u>	MATERIAL <u>clg</u>
THICKNESS <u>.375</u>	DIAMETER <u>12"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>12"</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURVES <u>4300</u>	TIME <u>1.00</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
	<u>10 X .11 LOG</u>	UNSHARPNESS <u>0.020</u>	FILM TOTAL <u>15</u>
	<u>Next Base Ceibs</u>	FILM PROCESSING MANUAL	TECHNICIAN <u>F. Rivera</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
DFM-5-8		✓		12" 1/2	4	4x4		A - LACK OF PENET				
X1-115		✓		12"	4	4x4		B - LACK OF FUSION				
0-1		✓						C - CRACKS				
2-0		✓						D - SLAG				
116		✓						E - POROSITY				
0-1		✓						F - UNDERCUT ROOT				
5-0		✓						G - UNDERCUT CAP				
X1-117		✓						H - TUNGSTEN				
0-1		✓						I - CONCAVITY CAP				
1-2		✓						J - CONCAVITY ROOT				
2-0		✓						K - WORM HOLE				
X2-118		✓						L - BURN THROUGH				
0-1		✓						M - HOT TEAR				
5-0		✓						N - PIN HOLE				
X2-119		✓						O - HIGH LOW				
0-1		✓										
1-2		✓										
2-0		✓										

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOI


AC JOB No. _____ DATE 6/11/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

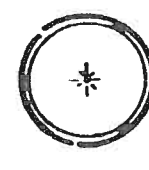
CLIENT	P.O. No.	DESCRIPTION	SCREENS	LEAD	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	SCREEN THICKNESS	MATERIAL	FILM TECHNIQUE		FILM VIEWING	WELDING PROCESS	FILM TOTAL
											DOUBLE	SINGLE			
ISOPE	DIMENSIONS	CURIES	LEAD	DISTANCE	TIME	UNSHARPNESS	UNSHARPNESS	SCREEN THICKNESS	SCREEN THICKNESS	TYPE II KODAK	TECHNICIAN	WELDING PROCESS	DOUBLE	SINGLE	MAN
IR-192	10 X .11 LOG		12"	12"	1:00	0.020	0.020	.010 FRONT & BACK	.010 FRONT & BACK	TYPE II KODAK	F. K. V. C.	AUTO	DOUBLE	SINGLE	MAN
PROJECT JOB No.															
VP-5		NAVY PUMP HO.													
X1-	100														
X1-	101														
X1-	102														
X1-	103														
X1-	104														
X1-	105														
X1-	106														
X1-	107														
X1-	108														
X1-	109														
X1-	110														

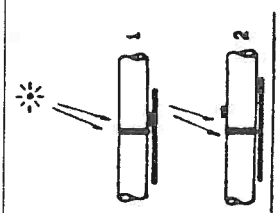
EXPOSURE TECHNIQUE

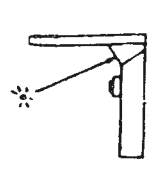
PENETRATOR SIZE _____ SOURCE SIDE FILM SIDE


SHOOTING SKETCH

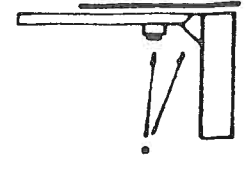
TECHNIQUE A 

TECHNIQUE B 

TECHNIQUE C 

TECHNIQUE D 

TECHNIQUE E 

TECHNIQUE F 

- CODE KEY**
- A - LACK OF PENET
 - B - LACK OF FUSION
 - C - CRACKS
 - D - SLAG
 - E - POROSITY
 - F - UNDERCUT ROOT
 - G - UNDERCUT CAP
 - H - TUNGSTEN
 - I - CONCAVITY CAP
 - J - CONCAVITY ROOT
 - K - WORM HOLE
 - L - BURN THROUGH
 - M - HOT TEAR
 - N - PIN HOLE
 - O - HIGH LOW

ACCEPT	REJECT	PIPE SIZE	No. OF FILM	FILM SIZE	CODE	CODE KEY
		12" 18" 5/16"	12	D		
		12" 18" 1/2"	12	D		
		12" 18" 3/4"	12	D		
		12" 18" 1"	12	D		
		12" 18" 1 1/4"	12	D		
		12" 18" 1 1/2"	12	D		
		12" 18" 1 3/4"	12	D		
		12" 18" 2"	12	D		
		12" 18" 2 1/4"	12	D		
		12" 18" 2 1/2"	12	D		
		12" 18" 2 3/4"	12	D		
		12" 18" 3"	12	D		
		12" 18" 3 1/4"	12	D		
		12" 18" 3 1/2"	12	D		
		12" 18" 3 3/4"	12	D		
		12" 18" 4"	12	D		

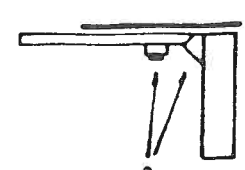
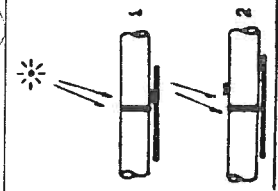
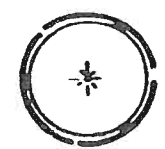
RADIOGRAPHY PROCEDURE, RECORD AND REPORT FORM

AC JOB No. _____ DATE 6/1/62
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT	P.O. No.	DESCRIPTION	SCREENS	LEAD	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	SCREEN THICKNESS	MATERIAL	FILM TECHNIQUE		FILM VIEWING		WELDING PROCESS	TYPE II KODAK	FILM TOTAL	TECHNICIAN	EXPOSURE TECHNIQUE	PENETRATOR SIZE	SHOOTING SKETCH		
											DOUBLE	SINGLE	DOUBLE	SINGLE							SOURCE SIDE	FILM SIDE	
Waukegan Job		Transfer line T-10 Wldg			12"	1:00	0.020	.010		12													
VP-1																							
VP-2																							
VP-3																							
VP-4																							
VP-5																							
VP-6																							
VP-7																							
VP-8																							
VP-9																							
VP-10																							
VP-11																							
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VP-46																							
VP-47																							
VP-48																							
VP-49																							
VP-50																							

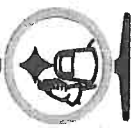
RESULTS
 Results leads

- A - LACK OF PENET
- B - LACK OF FUSION
- C - CRACKS
- D - SLAG
- E - POROSITY
- F - UNDERCUT ROOT
- G - UNDERCUT CAP
- H - TUNGSTEN
- I - CONCAVITY CAP
- J - CONCAVITY ROOT
- K - WORM HOLE
- L - BURN THROUGH
- M - HOT TEAR
- N - PIN HOLE
- O - HIGH LOW



CLIENT Workley P.O. No. _____ MATERIAL CF3
 THICKNESS 3/16" DIAMETER 16" CODE OR SPECIFICATION API 1104 SCREEN THICKNESS .010 FRONT & BACK FILM TECHNIQUE DOUBLE SINGLE FILM VIEWING DOUBLE SINGLE
 ISOPOPE IR-192 DIMENSIONS 10 X .11 LOG CURIES 44 DISTANCE 16" LEAD _____ TIME 1:50 UNSHARPNESS 0.020 FILM TYPE TYPE II KODAK WELDING PROCESS AUTO MAN
 PROJECT JOB No. NAVY Base Mil. Cuba FILM PROCESSING MANUAL _____ TECHNICIAN F. Rivera FILM TOTAL 8

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	DESCRIPTION	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
											<input type="checkbox"/> SOURCE SIDE	<input type="checkbox"/> FILM SIDE	
<u>VP-5</u>				<u>16" S</u>	<u>1</u>	<u>11x14</u>							
<u>N1-131</u>									<u>A - LACK OF PENET</u>	<u>TECHNIQUE A</u>			
<u>1-3</u>									<u>B - LACK OF FUSION</u>				
<u>2-3</u>									<u>C - CRACKS</u>				
<u>3-0</u>									<u>D - SLAG</u>				
									<u>E - POROSITY</u>				
<u>N1-130</u>									<u>F - UNDERCUT ROOT</u>	<u>TECHNIQUE B</u>			
<u>0-1</u>									<u>G - UNDERCUT CAP</u>				
<u>1-2</u>									<u>H - TUNGSTEN</u>				
<u>2-3</u>									<u>I - CONCAVITY CAP</u>				
<u>3-0</u>									<u>J - CONCAVITY ROOT</u>				
									<u>K - WORM HOLE</u>	<u>TECHNIQUE C</u>			
									<u>L - BURN THROUGH</u>				
									<u>M - HOT TEAR</u>				
									<u>N - PIN HOLE</u>				
									<u>O - HIGH LOW</u>	<u>TECHNIQUE D</u>			
										<u>TECHNIQUE E</u>			
										<u>TECHNIQUE F</u>			



ONSO & CAROL
iron works inc.

P.O. BOX 566 - CATAÑO, PUERTO RICO 00963
TELEPHONE: (787) 788-1065
FAX: (787) 788-0350

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 10/20/80 PROCEDURE No. 52-21350-01 PAGE _____ OF _____

CLIENT	THICKNESS	DIAMETER	CODE OR SPECIFICATION	P.O. No.	DESCRIPTION	SCREENS	LEAD	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	FILM TECHNIQUE		MATERIAL	
												DOUBLE	SINGLE		
ISOPE	IR-192	DIMENSIONS	10 X .11 LOG	CURIES	LEAD	SCREEN THICKNESS	LEAD	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	DOUBLE	SINGLE	TYPE II KODAK	
PROJECT JOB No. <u>Alam Base Pvc</u>															
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE							
								PENETRATOR SIZE	SOURCE SIDE	FILM SIDE	FILM VIEWING	WELDING PROCESS	FILM TOTAL	TECHNICIAN	
<u>PH-1982</u>			<u>1" 2 416</u>	<u>10</u>	<u>416</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>9</u>	<u>15</u>
<u>X1-136</u>			<u>1" 10</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-137</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-138</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-139</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-140</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-141</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-142</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-143</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-144</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-145</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-146</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-147</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-148</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-149</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-150</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-151</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-152</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-153</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-154</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-155</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-156</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-157</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-158</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-159</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-160</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-161</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-162</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-163</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-164</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-165</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-166</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-167</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-168</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-169</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-170</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-171</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-172</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-173</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-174</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-175</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-176</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-177</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-178</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-179</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-180</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-181</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-182</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-183</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-184</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-185</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-186</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-187</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-188</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-189</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-190</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-191</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-192</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-193</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-194</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-195</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-196</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-197</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-198</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-199</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>X1-200</u>			<u>1" 2 0V</u>	<u>10</u>	<u>10</u>							<input type="checkbox"/>	<input checked="" type="checkbox"/>		

EXPOSURE DEVICE 1374 INTERPRETED BY [Signature] LEVEL III

ADIOPHOTOGRAPHY PROCEDURE, RECORD AND REPORT FORM

LONDO & CARUS
 iron world inc.
 P.O. BOX 566 - CATAÑO, PUERTO RICO 00963
 TELEPHONE: (787) 788-1065
 FAX: (787) 788-0350

AC JOB No. _____ DATE 6/13/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT		P.O. No.		DESCRIPTION		MATERIAL		FILM TECHNIQUE		FILM VIEWING	
THICKNESS		DIAMETER		CODE OR SPECIFICATION		SCREEN THICKNESS		DOUBLE		DOUBLE	
ISOPE		DIMENSIONS		CURIES		LEAD		FILM TYPE		WELDING PROCESS	
IR-192		10 X .11 LOG		214		16"		TYPE II KODAK		AUTO	
PROJECT JOB No.		Navy Base Proj.		FILM PROCESSING MANUAL		UNSHARPNESS		TECHNICIAN		FILM TOTAL	
FITTING SEAM OR JOINT No.		FILM IDENTITY No.		ACCEPT		TIME		F.R. King		13	
				REJECT		1:40				15	
				PIPE SIZE		0.020				SOURCE SIDE	
				No. OF FILM		FILM PROCESSING MANUAL				FILM SIDE	
				No. OF FILM						SHOOTING SKETCH	
				SIZE							
				REJECT							
				ACCEPT							
Dock Aves											
142											
1-2											
2-0											
3-0											
143											
1-2											
2-0											
3-0											
144											
1-2											
2-0											
3-0											

EXPOSURE TECHNIQUE

PENETRATOR SIZE _____

SOURCE SIDE FILM SIDE

SHOOTING SKETCH

TECHNIQUE A

TECHNIQUE B

TECHNIQUE C

TECHNIQUE D

TECHNIQUE E

TECHNIQUE F

- CODE KEY**
- A - LACK OF PENET
 - B - LACK OF FUSION
 - C - CRACKS
 - D - SLAG
 - E - POROSITY
 - F - UNDERCUT ROOT
 - G - UNDERCUT CAP
 - H - TUNGSTEN
 - I - CONCAVITY CAP
 - J - CONCAVITY ROOT
 - K - WORM HOLE
 - L - BURN THROUGH
 - M - HOT TEAR
 - N - PIN HOLE
 - O - HIGH LOW

EXPOSURE DEVICE _____ INTERPRETED BY _____ LEVEL _____

B-1374

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOF

AC JOB No. _____ DATE 6/14/02 PAGE _____ OF _____
 LICENSE No. 52-21350-01 PROCEDURE No. _____

CLIENT	THICKNESS	DIAMETER	CODE OR SPECIFICATION	CURIES	DISTANCE	LEAD	SCREENS	DESCRIPTION	MATERIAL	FILM VIEWING		FILM TOTAL	
										DOUBLE	SINGLE		DOUBLE
ISOPEE	IR-192	DIMENSIONS	10 X .11 LOG	44	8"	8"	.010 FRONT & BACK	TYPE II KODAK	TYPE II KODAK	WELDING PROCESS	UNSHARPNESS	TECHNIQUE	
PROJECT JOB No.		P.O. No.		FILM PROCESSING		MANUAL		TECHNIQUE		EXPOSURE		SHOOTING SKETCH	
FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	PENETRATOR SIZE		TECHNIQUE		
									SOURCE SIDE	FILM SIDE	A	B	
<u>Beata Area</u>	<u>146</u>	<u>8"</u>	<u>3 4/2</u>	<u>X</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>
<u>M-1</u>	<u>146</u>	<u>8"</u>	<u>3 4/2</u>	<u>X</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>
<u>0-6</u>	<u>146</u>	<u>8"</u>	<u>3 4/2</u>	<u>X</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>
<u>2-0</u>	<u>146</u>	<u>8"</u>	<u>3 4/2</u>	<u>X</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>
<u>M-1</u>	<u>146</u>	<u>8"</u>	<u>3 4/2</u>	<u>X</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>
<u>0-1</u>	<u>146</u>	<u>8"</u>	<u>3 4/2</u>	<u>X</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>
<u>1-2</u>	<u>146</u>	<u>8"</u>	<u>3 4/2</u>	<u>X</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>
<u>2-0</u>	<u>146</u>	<u>8"</u>	<u>3 4/2</u>	<u>X</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>	<u>8"</u>

EXPOSURE DEVICE 1374 INTERPRETED BY [Signature] LEVEL III

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOI

AC JOB No. _____ DATE 6/14/02 PAGE _____ OF _____
 LICENSE No. 52-21350-01 PROCEDURE No. _____

CLIENT <u>Worley Ind.</u>	P.O. No.	DESCRIPTION <u>Transverse Line Tie in Welds</u>	MATERIAL <u>CL6</u>
THICKNESS <u>375</u>	DIAMETER <u>126</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS <u>10 X .11 LOG</u>	TIME <u>1:05</u>	FILM TYPE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>43</u>	UNSHARPNESS <u>0.020</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
	<u>Naval Base Key</u>	FILM PROCESSING MANUAL	TECHNICIAN <u>F. K...</u>
			FILM TOTAL <u>15</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	DESCRIPTION	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE	SOURCE SIDE	FILM SIDE	SHOOTING SKETCH
<u>X11-147</u>	<u>0-1</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			A - LACK OF PENET					TECHNIQUE B
<u>X11-148</u>	<u>0-2</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			B - LACK OF FUSION					TECHNIQUE A
<u>X11-149</u>	<u>0-3</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			C - CRACKS					TECHNIQUE C
<u>X11-150</u>	<u>0-4</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			D - SLAG					TECHNIQUE D
<u>X11-151</u>	<u>0-5</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			E - POROSITY					TECHNIQUE E
<u>X11-152</u>	<u>0-6</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			F - UNDERCUT ROOT					TECHNIQUE F
<u>X11-153</u>	<u>0-7</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			G - UNDERCUT CAP					TECHNIQUE G
<u>X11-154</u>	<u>0-8</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			H - TUNGSTEN					TECHNIQUE H
<u>X11-155</u>	<u>0-9</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			I - CONCAVITY CAP					TECHNIQUE I
<u>X11-156</u>	<u>0-10</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			J - CONCAVITY ROOT					TECHNIQUE J
<u>X11-157</u>	<u>0-11</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			K - WORM HOLE					TECHNIQUE K
<u>X11-158</u>	<u>0-12</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			L - BURN THROUGH					TECHNIQUE L
<u>X11-159</u>	<u>0-13</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			M - HOT TEAR					TECHNIQUE M
<u>X11-160</u>	<u>0-14</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			N - PIN HOLE					TECHNIQUE N
<u>X11-161</u>	<u>0-15</u>	<u>✓</u>	<u>✓</u>	<u>12 1/2</u>	<u>1</u>	<u>12 1/2</u>			O - HIGH LOW					TECHNIQUE O



iron
weather
inc.

ONSO & CARUS

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TELEPHONE: (787) 788-1065
FAX: (787) 788-0350

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOF

AC JOB No. _____ DATE 6/14/02
LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE 1 OF 1

CLIENT <u>Iron Weather Inc.</u>	P.O. No. <u>711</u>	DESCRIPTION <u>190 #381</u>	MATERIAL
THICKNESS <u>0.80</u>	DIAMETER <u>6.0</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS 10 X .11 LOG	LEAD <u>6</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>13.2</u>	TIME <u>.17</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
	10 X .11 LOG	UNSHARPNESS <u>0.020</u>	TYPE II KODAK
		FILM PROCESSING MANUAL	FILM TOTAL

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
<u>118</u>	<u>153</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		A - LACK OF PENET	<u>TECHNIQUE A</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>154</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		B - LACK OF FUSION	<u>TECHNIQUE B</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>155</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		C - CRACKS	<u>TECHNIQUE C</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>156</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		D - SLAG	<u>TECHNIQUE D</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>157</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		E - POROSITY	<u>TECHNIQUE E</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>158</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		F - UNDERCUT ROOT	<u>TECHNIQUE F</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>159</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		G - UNDERCUT CAP	<u>TECHNIQUE G</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>160</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		H - TUNGSTEN	<u>TECHNIQUE H</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>161</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		I - CONCAVITY CAP	<u>TECHNIQUE I</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>162</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		J - CONCAVITY ROOT	<u>TECHNIQUE J</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>163</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		K - WORM HOLE	<u>TECHNIQUE K</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>164</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		L - BURN THROUGH	<u>TECHNIQUE L</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>165</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		M - HOT TEAR	<u>TECHNIQUE M</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>166</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		N - PIN HOLE	<u>TECHNIQUE N</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>118</u>	<u>167</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>6.0</u>	<u>10</u>	<u>10</u>		O - HIGH LOW	<u>TECHNIQUE O</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

EXPOSURE DEVICE _____ INTERPRETED BY _____ LEVEL _____

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 8/14/62
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE 1 OF 1

CLIENT <u>Wickley Tank</u>	P.O. No.	DESCRIPTION <u>199 # 381</u>	MATERIAL
THICKNESS <u>3/8"</u>	DIAMETER <u>12"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
ISOPE IR-192	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>10'</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>12.2</u>	TIME <u>105</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input type="checkbox"/> MAN
		UNSHARPNESS <u>0.020</u>	FILM TOTAL <u>18</u>
		FILM PROCESSING MANUAL	TECHNICIAN <u>F. H. G. 2</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	No. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
<u>192</u>	<u>158</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		A - LACK OF PENET		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>159</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		B - LACK OF FUSION		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>160</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		C - CRACKS		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>161</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		D - SLAG		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>162</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		E - POROSITY		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>163</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		F - UNDERCUT ROOT		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>164</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		G - UNDERCUT CAP		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>165</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		H - TUNGSTEN		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>166</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		I - CONCAVITY CAP		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>167</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		J - CONCAVITY ROOT		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>168</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		K - WORM HOLE		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>169</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		L - BURN THROUGH		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>170</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		M - HOT TEAR		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>171</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		N - PIN HOLE		<input type="checkbox"/>	<input type="checkbox"/>	
<u>192</u>	<u>172</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>2 1/2"</u>	<u>12</u>	<u>120</u>		O - HIGH LOW		<input type="checkbox"/>	<input type="checkbox"/>	



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RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE 6/18/02
LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <u>Workley Int'l</u>	P.O. No.	DESCRIPTION <u>Truss for live tie in Adams</u>	MATERIAL <u>CLG</u>
THICKNESS <u>.375</u>	DIAMETER <u>1.0"</u>	CODE OR SPECIFICATION <u>API 1104</u>	FILM THICKNESS <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE IR-192	DIMENSIONS 10 X .11 LOG	CURIES <u>46.6</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.		LEAD <u>1/4"</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		DISTANCE <u>18"</u>	TYPE II KODAK <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		TIME <u>5:30</u>	FILM TOTAL <u>3</u>
		UNSHARPNESS <u>0.020</u>	
		FILM PROCESSING MANUAL	
		FILM PROCESSING MANUAL	
		TECHNICIAN <u>F. Rivera</u>	

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
<u>VP# 10</u>					<u>12.3 411</u>							
<u>XA-165</u>								A - LACK OF PENET	TECHNIQUE A			
<u>0-1 V</u>								B - LACK OF FUSION				
<u>1-2 V</u>								C - CRACKS				
<u>2-0 V</u>								D - SLAG				
								E - POROSITY				
								F - UNDERCUT ROOT				
								G - UNDERCUT CAP				
								H - TUNGSTEN				
								I - CONCAVITY CAP				
								J - CONCAVITY ROOT				
								K - WORM HOLE				
								L - BURN THROUGH				
								M - HOT TEAR				
								N - PIN HOLE				
								O - HIGH LOW				

EXPOSURE DEVICE B-1324 INTERPRETED BY _____ LEVEL III

CLIENT <u>Abeylen Int'l.</u>	P.O. No.	DESCRIPTION <u>frustrating Tie in Wils Pt. 301</u>	MATERIAL <u>els</u>
THICKNESS <u>386</u>	DIAMETER <u>6"</u>	SCREEN THICKNESS <u>.010 FRONT & BACK</u>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>60"</u>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <u>41.6</u>	TIME <u>41.6</u>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		UNSHARPNESS <u>0.020</u>	FILM TOTAL <u>1d</u>
		FILM PROCESSING MANUAL	TECHNICIAN <u>f.k.c.</u>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	EXPOSURE TECHNIQUE	CODE KEY		
									A - LACK OF PENET	B - LACK OF FUSION	
<u>PHH 381</u>		<input checked="" type="checkbox"/>		<u>6" x 1/4"</u>	<u>10</u>	<u>10</u>				TECHNIQUE A	TECHNIQUE B
<u>Xt-166</u>		<input checked="" type="checkbox"/>								TECHNIQUE C	TECHNIQUE D
<u>0-1</u>		<input checked="" type="checkbox"/>								TECHNIQUE E	TECHNIQUE F
<u>1-2</u>		<input checked="" type="checkbox"/>								TECHNIQUE G	TECHNIQUE H
<u>2-0</u>		<input checked="" type="checkbox"/>								TECHNIQUE I	TECHNIQUE J
<u>Xt-167</u>		<input checked="" type="checkbox"/>								TECHNIQUE K	TECHNIQUE L
<u>0-1</u>		<input checked="" type="checkbox"/>								TECHNIQUE M	TECHNIQUE N
<u>1-3</u>		<input checked="" type="checkbox"/>								TECHNIQUE O	TECHNIQUE P
<u>2-0</u>		<input checked="" type="checkbox"/>								TECHNIQUE Q	TECHNIQUE R
<u>Xt-168</u>		<input checked="" type="checkbox"/>								TECHNIQUE S	TECHNIQUE T
<u>0-1</u>		<input checked="" type="checkbox"/>								TECHNIQUE U	TECHNIQUE V
<u>1-2</u>		<input checked="" type="checkbox"/>								TECHNIQUE W	TECHNIQUE X
<u>2-0</u>		<input checked="" type="checkbox"/>								TECHNIQUE Y	TECHNIQUE Z
<u>Xt-169</u>		<input checked="" type="checkbox"/>								TECHNIQUE AA	TECHNIQUE AB
<u>0-1</u>		<input checked="" type="checkbox"/>								TECHNIQUE AC	TECHNIQUE AD
<u>1-3</u>		<input checked="" type="checkbox"/>								TECHNIQUE AE	TECHNIQUE AF
<u>2-0</u>		<input checked="" type="checkbox"/>								TECHNIQUE AG	TECHNIQUE AH

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOI

AC JOB No. _____ DATE 6/18/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT	P.O. No.	DESCRIPTION	SCREENS	LEAD	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	FILM TECHNIQUE	MATERIAL	FILM VIEWING		WELDING PROCESS	FILM TOTAL
											DOUBLE	SINGLE		
THICKNESS	DIA	CODE OR SPECIFICATION	LEAD	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	FILM TECHNIQUE	MATERIAL	FILM VIEWING		WELDING PROCESS	FILM TOTAL	
ISOPE	DIMENSIONS	CURIES	DISTANCE	TIME	UNSHARPNESS	FILM THICKNESS	FILM TECHNIQUE	MATERIAL	FILM VIEWING		WELDING PROCESS	FILM TOTAL		
IR-192	10 X .11 LOG	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
PROJECT JOB No.	TECHNICIAN													
Manual														
F. Kraus														
EXPOSURE TECHNIQUE														
PENETRATOR SIZE _____ SOURCE SIDE _____ FILM SIDE _____														
SHOOTING SKETCH														
Trap # 381	12 1/2	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11A 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11B 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11C 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11D 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11E 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11F 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11G 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11H 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11I 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11J 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11K 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11L 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11M 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11N 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11O 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11P 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11Q 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11R 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11S 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11T 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11U 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11V 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11W 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11X 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11Y 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		
X11Z 170	12	41.6	124	1:05	0.020	.010 FRONT & BACK	DOUBLE	SINGLE	DOUBLE	SINGLE	AUTO	MAN		

EXPOSURE DEVICE B-1374 INTERPRETED BY _____ LEVEL _____

CLIENT Workley Tank P.O. No. _____ MATERIAL Trap - 381 Repair
 THICKNESS .375 DIAMETER 12" CODE OR SPECIFICATION API 1104 SCREEN THICKNESS .010 FRONT & BACK FILM TECHNIQUE DOUBLE SINGLE
 ISOPOPE IR-192 DIMENSIONS 10 X .11 LOG CURIES 40 DISTANCE 12" TIME 1:05 UNSHARPNESS 0.020 FILM PROCESSING MANUAL 1 FILM VIEWING DOUBLE SINGLE
 PROJECT JOB No. NAVY Base Proj. WELDING PROCESS AUTO MANUAL

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	TECHNIQUE	SHOOTING SKETCH	PENETRATOR SIZE	EXPOSURE TECHNIQUE	
												<input type="checkbox"/> SOURCE SIDE	<input type="checkbox"/> FILM SIDE
<u>XRC-1701</u>		<u>1</u>		<u>12" L 4"</u>				<u>A - LACK OF PENET</u>	<u>TECHNIQUE A</u>		<u>15</u>		
<u>2-0</u>								<u>B - LACK OF FUSION</u>	<u>TECHNIQUE B</u>				
<u>Trap # 381</u>								<u>C - CRACKS</u>	<u>TECHNIQUE C</u>				
								<u>D - SLAG</u>	<u>TECHNIQUE D</u>				
								<u>E - POROSITY</u>	<u>TECHNIQUE E</u>				
								<u>F - UNDERCUT ROOT</u>	<u>TECHNIQUE F</u>				
								<u>G - UNDERCUT CAP</u>	<u>TECHNIQUE G</u>				
								<u>H - TUNGSTEN</u>	<u>TECHNIQUE H</u>				
								<u>I - CONCAVITY CAP</u>	<u>TECHNIQUE I</u>				
								<u>J - CONCAVITY ROOT</u>	<u>TECHNIQUE J</u>				
								<u>K - WORM HOLE</u>	<u>TECHNIQUE K</u>				
								<u>L - BURN THROUGH</u>	<u>TECHNIQUE L</u>				
								<u>M - HOT TEAR</u>	<u>TECHNIQUE M</u>				
								<u>N - PIN HOLE</u>	<u>TECHNIQUE N</u>				
								<u>O - HIGH LOW</u>	<u>TECHNIQUE O</u>				



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RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOF

AC JOB No. _____ DATE _____
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <i>Naval Base Ciba</i>	P.O. No.	DESCRIPTION <i>Dock Area</i>	MATERIAL
THICKNESS <i>0.75</i>	DIAMETER <i>8"</i>	SCREEN THICKNESS .010 FRONT & BACK	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE IR-192	DIMENSIONS 10 X .11 LOG	LEAD <i>8"</i>	FILM TYPE TYPE II KODAK
PROJECT JOB No.	CURIES <i>10.8</i>	UNSHARPNESS 0.020	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		FILM PROCESSING MANUAL	FILM TOTAL

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	
									PENETRATOR SIZE	SHOOTING SKETCH
<i>181</i>	<i>181</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		A - LACK OF PENET		TECHNIQUE B
<i>182</i>	<i>182</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		B - LACK OF FUSION		TECHNIQUE A
<i>183</i>	<i>183</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		C - CRACKS		TECHNIQUE C
<i>184</i>	<i>184</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		D - SLAG		TECHNIQUE D
<i>185</i>	<i>185</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		E - POROSITY		TECHNIQUE E
<i>186</i>	<i>186</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		F - UNDERCUT ROOT		TECHNIQUE F
<i>187</i>	<i>187</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		G - UNDERCUT CAP		TECHNIQUE G
<i>188</i>	<i>188</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		H - TUNGSTEN		TECHNIQUE H
<i>189</i>	<i>189</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		I - CONCAVITY CAP		TECHNIQUE I
<i>190</i>	<i>190</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		J - CONCAVITY ROOT		TECHNIQUE J
<i>191</i>	<i>191</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		K - WORM HOLE		TECHNIQUE K
<i>192</i>	<i>192</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		L - BURN THROUGH		TECHNIQUE L
<i>193</i>	<i>193</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		M - HOT TEAR		TECHNIQUE M
<i>194</i>	<i>194</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		N - PIN HOLE		TECHNIQUE N
<i>195</i>	<i>195</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>1</i>	<i>10x11</i>		O - HIGH LOW		TECHNIQUE O

EXPOSURE DEVICE _____ INTERPRETED BY *[Signature]* LEVEL _____

AC JOB No. _____

DATE _____

LICENSE No. 52-21350-01

PROCEDURE No. _____

PAGE _____

OF _____

CLIENT <i>Wabco</i>	P.O. No.	DESCRIPTION <i>Jack Hoes</i>	PROCEDURE No.	MATERIAL
THICKNESS <i>0.27</i>	DIAMETER <i>0.11</i>	SCREEN THICKNESS .010 FRONT & BACK	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE	FILM VIEWING <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS 10 X .11 LOG	LEAD <i>5/16</i>	FILM TYPE TYPE II KODAK	WELDING PROCESS <input type="checkbox"/> AUTO <input type="checkbox"/> MAN
PROJECT JOB No.	CURIES <i>90.8</i>	TIME <i>1.13</i>	UNSHARPNESS 0.020	FILM TOTAL <i>18</i>
FILM PROCESSING MANUAL		TECHNICIAN <i>Jim H. 0.2</i>		

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	
									SOURCE SIDE	FILM SIDE
<i>183</i>	<i>183</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		A - LACK OF PENET		TECHNIQUE A
<i>184</i>	<i>184</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		B - LACK OF FUSION		TECHNIQUE B
<i>185</i>	<i>185</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		C - CRACKS		TECHNIQUE C
<i>186</i>	<i>186</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		D - SLAG		TECHNIQUE D
<i>187</i>	<i>187</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		E - POROSITY		TECHNIQUE E
<i>188</i>	<i>188</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		F - UNDERCUT ROOT		TECHNIQUE F
<i>189</i>	<i>189</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		G - UNDERCUT CAP		TECHNIQUE G
<i>190</i>	<i>190</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		H - TUNGSTEN		TECHNIQUE H
<i>191</i>	<i>191</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		I - CONCAVITY CAP		TECHNIQUE I
<i>192</i>	<i>192</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		J - CONCAVITY ROOT		TECHNIQUE J
<i>193</i>	<i>193</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		K - WORM HOLE		TECHNIQUE K
<i>194</i>	<i>194</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		L - BURN THROUGH		TECHNIQUE L
<i>195</i>	<i>195</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		M - HOT TEAR		TECHNIQUE M
<i>196</i>	<i>196</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		N - PIN HOLE		TECHNIQUE N
<i>197</i>	<i>197</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>3/4</i>	<i>10</i>	<i>10</i>		O - HIGH LOW		TECHNIQUE O

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FORM

AC JOB No. _____ DATE _____
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <i>Alamo Base Proj</i>	P.O. No.	DESCRIPTION <i>Block</i>	MATERIAL
THICKNESS <i>0.20</i>	DIAMETER <i>8"</i>	SCREEN THICKNESS .010 FRONT & BACK	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS 10 X .11 LOG	TIME <i>45</i>	FILM TYPE TYPE II KODAK
PROJECT JOB No.	CURIES <i>40.8</i>	UNSHARPNESS 0.020	WELDING PROCESS <input type="checkbox"/> AUTO <input type="checkbox"/> MAN
	<i>Alamo Base Proj</i>	FILM PROCESSING MANUAL	TECHNICIAN <i>P.02</i>
			FILM TOTAL <i>15</i>

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										<input type="checkbox"/> SOURCE SIDE	<input checked="" type="checkbox"/> FILM SIDE	
<i>190</i>	<i>190</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>15</i>	<i>4x</i>		A - LACK OF PENET		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>191</i>	<i>191</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		B - LACK OF FUSION		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>192</i>	<i>192</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		C - CRACKS		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>193</i>	<i>193</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		D - SLAG		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>194</i>	<i>194</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		E - POROSITY		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>195</i>	<i>195</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		F - UNDERCUT ROOT		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>196</i>	<i>196</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		G - UNDERCUT CAP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>197</i>	<i>197</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		H - TUNGSTEN		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>198</i>	<i>198</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		I - CONCAVITY CAP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>199</i>	<i>199</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		J - CONCAVITY ROOT		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>200</i>	<i>200</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		K - WORM HOLE		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>201</i>	<i>201</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		L - BURN THROUGH		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>202</i>	<i>202</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		M - HOT TEAR		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>203</i>	<i>203</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		N - PIN HOLE		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>204</i>	<i>204</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>8"</i>	<i>17</i>	<i>4x</i>		O - HIGH LOW		<input type="checkbox"/>	<input checked="" type="checkbox"/>	

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FORM

AC JOB No. _____ DATE _____
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT Learley Tool	P.O. No.	DESCRIPTION Pipe base etc	MATERIAL
THICKNESS 3/8"	DIAMETER 6"	SCREEN THICKNESS .010 FRONT & BACK	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS 10 X .11 LOG	LEAD 16"	FILM VIEWING <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES 40.8	TIME 2:00	WELDING PROCESS <input type="checkbox"/> AUTO <input type="checkbox"/> MAN
		UNSHARPNESS 0.020	TYPE II KODAK <input type="checkbox"/> AUTO <input type="checkbox"/> MAN
		FILM PROCESSING MANUAL	FILM TOTAL

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
100-	197	✓	✓	1 1/2"	1	4x4"		A - LACK OF PENET	TECHNIQUE A			
	198	✓	✓	1 1/2"	1	4x4"		B - LACK OF FUSION	TECHNIQUE B			
	199	✓	✓	1 1/2"	1	4x4"		C - CRACKS	TECHNIQUE C			
	200	✓	✓	1 1/2"	1	4x4"		D - SLAG	TECHNIQUE C			
100-	201	✓	✓	1 1/2"	1	4x4"		E - POROSITY	TECHNIQUE C			
	202	✓	✓	1 1/2"	1	4x4"		F - UNDERCUT ROOT	TECHNIQUE C			
	203	✓	✓	1 1/2"	1	4x4"		G - UNDERCUT CAP	TECHNIQUE C			
	204	✓	✓	1 1/2"	1	4x4"		H - TUNGSTEN	TECHNIQUE C			
	205	✓	✓	1 1/2"	1	4x4"		I - CONCAVITY CAP	TECHNIQUE C			
	206	✓	✓	1 1/2"	1	4x4"		J - CONCAVITY ROOT	TECHNIQUE C			
								K - WORM HOLE	TECHNIQUE D			
								L - BURN THROUGH	TECHNIQUE D			
								M - HOT TEAR	TECHNIQUE E			
								N - PIN HOLE	TECHNIQUE E			
								O - HIGH LOW	TECHNIQUE F			

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FORM

AC JOB No. _____ DATE _____
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <i>High Bay Ball</i>	R.O. No.	DESCRIPTION <i>High Bay Base Area</i>	MATERIAL
THICKNESS <i>3/8"</i>	DIAMETER <i>12"</i>	SCREEN THICKNESS .010 FRONT & BACK	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPE IR-192	DIMENSIONS 10 X .11 LOG	TIME <i>2:00</i>	FILM TYPE TYPE II KODAK
PROJECT JOB No.	CURIES <i>50-8</i>	UNSHARPNESS 0.020	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
		FILM PROCESSING MANUAL	FILM TOTAL

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	No. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	
									SOURCE SIDE	FILM SIDE
										TECHNIQUE A
										TECHNIQUE B
										TECHNIQUE C
										TECHNIQUE D
										TECHNIQUE E
										TECHNIQUE F

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

AC JOB No. _____ DATE *6/20/82*
 LICENSE No. *52-21350-01* PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <i>Lockley Ind.</i>	P.O. No.	DESCRIPTION <i>Tank from TRH 38'</i>	MATERIAL <i>304</i>
THICKNESS <i>1/2"</i>	DIAMETER <i>6"</i>	SCREEN THICKNESS <i>.010 FRONT & BACK</i>	FILM TECHNIQUE <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
ISOPOPE IR-192	DIMENSIONS <i>10 X .11 LOG</i>	LEAD <i>6"</i>	FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE
PROJECT JOB No.	CURIES <i>40</i>	TIME <i>20</i>	WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN
FILM PROCESSING MANUAL		FILM TOTAL	
TECHNICIAN <i>F. P. ...</i>		TYPE II KODAK	

FITTING SEAM OR JOINT No.	FILM IDENTITY No.	ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE	PENETRATOR SIZE		SHOOTING SKETCH
										SOURCE SIDE	FILM SIDE	
<i>TRH 38'</i>	<i>101</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		A - LACK OF PENET		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>102</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		B - LACK OF FUSION		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>103</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		C - CRACKS		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>104</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		D - SLAG		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>105</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		E - POROSITY		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>106</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		F - UNDERCUT ROOT		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>107</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		G - UNDERCUT CAP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>108</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		H - TUNGSTEN		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>109</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		I - CONCAVITY CAP		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>110</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		J - CONCAVITY ROOT		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>111</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		K - WORM HOLE		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>112</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		L - BURN THROUGH		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>113</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		M - HOT TEAR		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>114</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		N - PIN HOLE		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>101</i>	<i>115</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>6"</i>	<i>1</i>	<i>10</i>		O - HIGH LOW		<input type="checkbox"/>	<input checked="" type="checkbox"/>	

RADIOGRAPHY PROCEDURE, RECORD AND REPORT FOR

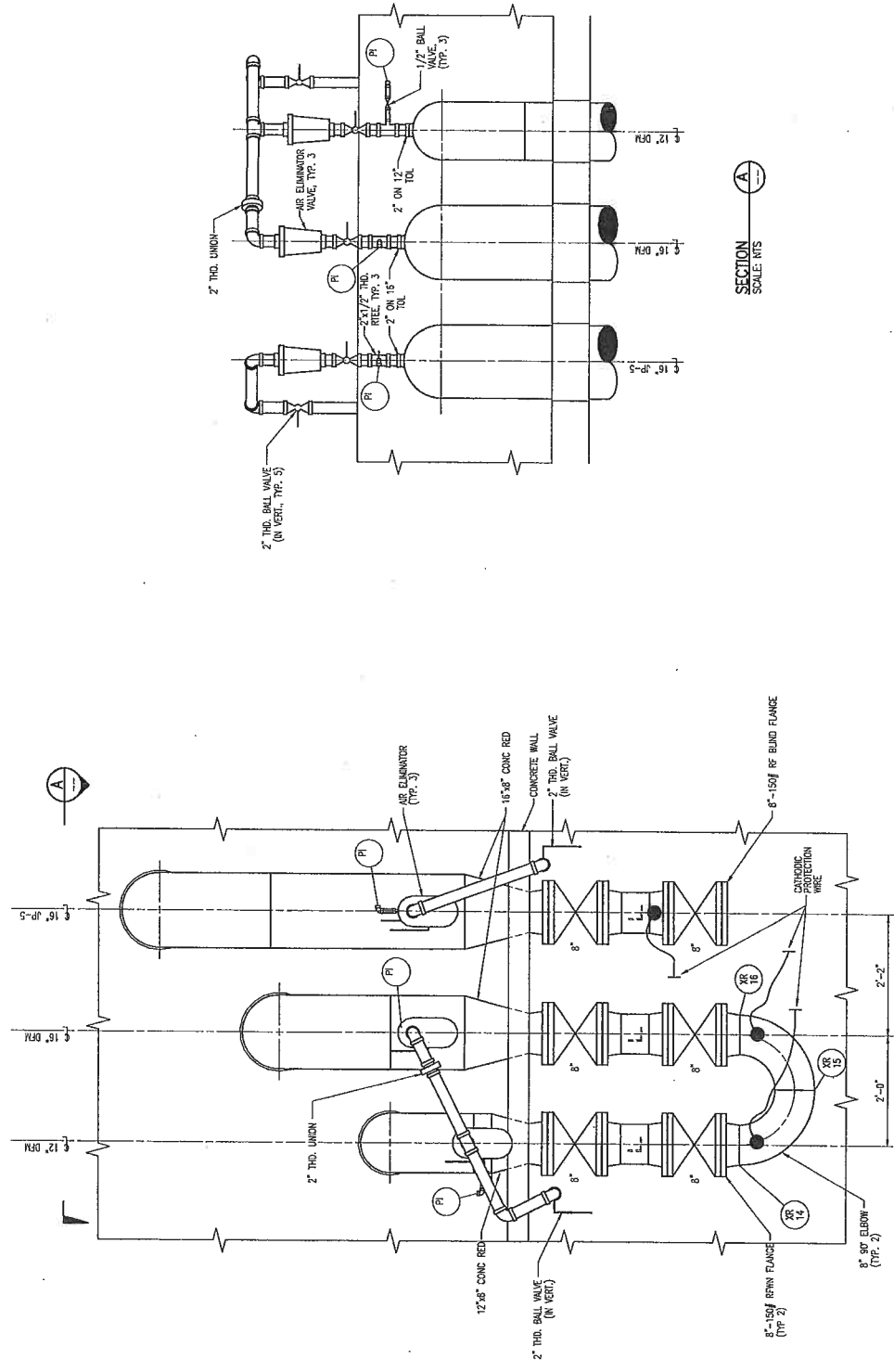
AC JOB No. _____ DATE 6/20/02
 LICENSE No. 52-21350-01 PROCEDURE No. _____ PAGE _____ OF _____

CLIENT <u>Walden</u>	P.O. No.	DESCRIPTION <u>Task Force TRH 381 Train Blvd</u>	MATERIAL
THICKNESS <u>3/32</u>	DIAMETER <u>1 1/2"</u>	SCREENS <u>APR 1104</u>	FILM THICKNESS <u>0.010</u>
ISOPE <u>IR-192</u>	DIMENSIONS <u>10 X .11 LOG</u>	LEAD <u>1/2"</u>	UNSHARPNESS <u>0.020</u>
PROJECT JOB No.	CURIES <u>40</u>	TIME <u>1.15</u>	FILM PROCESSING <u>MANUAL</u>
FITTING SEAM OR JOINT No.		TECHNICIAN <u>F. K. V. V. 2</u>	
FILM IDENTITY No.		TYPE II KODAK <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN	
ACCEPT		PENETRATOR SIZE <input type="checkbox"/> SOURCE SIDE <input checked="" type="checkbox"/> FILM SIDE	
REJECT		SHOOTING SKETCH	
PIPE SIZE		EXPOSURE TECHNIQUE	
NO. OF FILM		FILM VIEWING <input type="checkbox"/> DOUBLE <input checked="" type="checkbox"/> SINGLE	
WELDING PROCESS		WELDING PROCESS <input type="checkbox"/> AUTO <input checked="" type="checkbox"/> MAN	
FILM TOTAL		FILM TOTAL <u>9</u>	

ACCEPT	REJECT	PIPE SIZE	NO. OF FILM	FILM SIZE	CODE	CODE KEY	EXPOSURE TECHNIQUE
						A - LACK OF PENET	TECHNIQUE A
						B - LACK OF FUSION	TECHNIQUE B
						C - CRACKS	TECHNIQUE C
						D - SLAG	TECHNIQUE D
						E - POROSITY	TECHNIQUE E
						F - UNDERCUT ROOT	TECHNIQUE F
						G - UNDERCUT CAP	TECHNIQUE G
						H - TUNGSTEN	TECHNIQUE H
						I - CONCAVITY CAP	TECHNIQUE I
						J - CONCAVITY ROOT	TECHNIQUE J
						K - WORM HOLE	TECHNIQUE K
						L - BURN THROUGH	TECHNIQUE L
						M - HOT TEAR	TECHNIQUE M
						N - PIN HOLE	TECHNIQUE N
						O - HIGH LOW	TECHNIQUE O



J-06 Contractor Record of Weld Examinations (Weld Maps)



SECTION A-A
 SCALE: NTS

THE DRAWING WAS PREPARED BY
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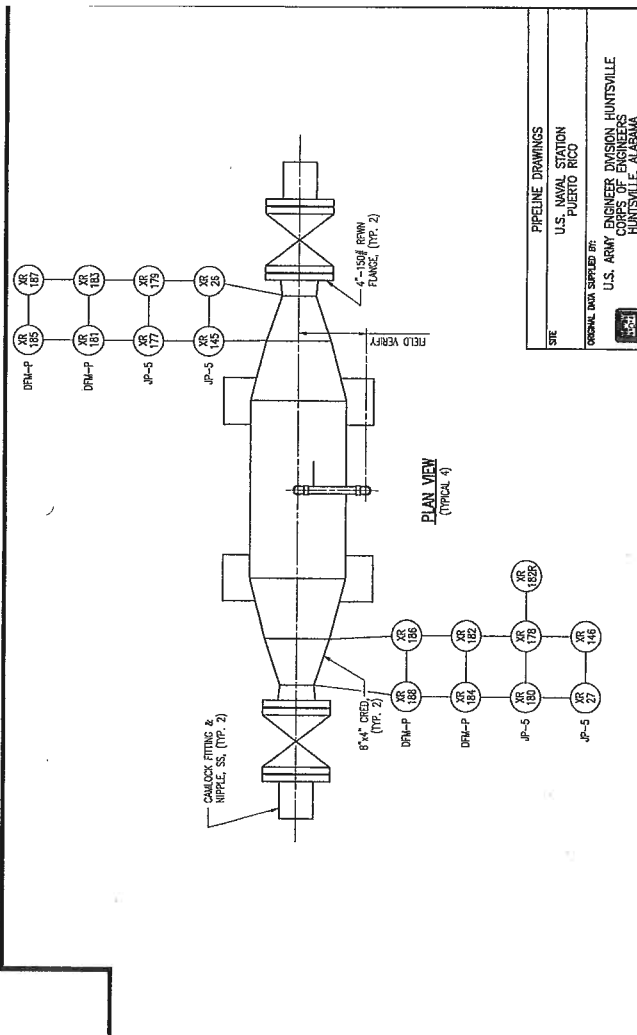
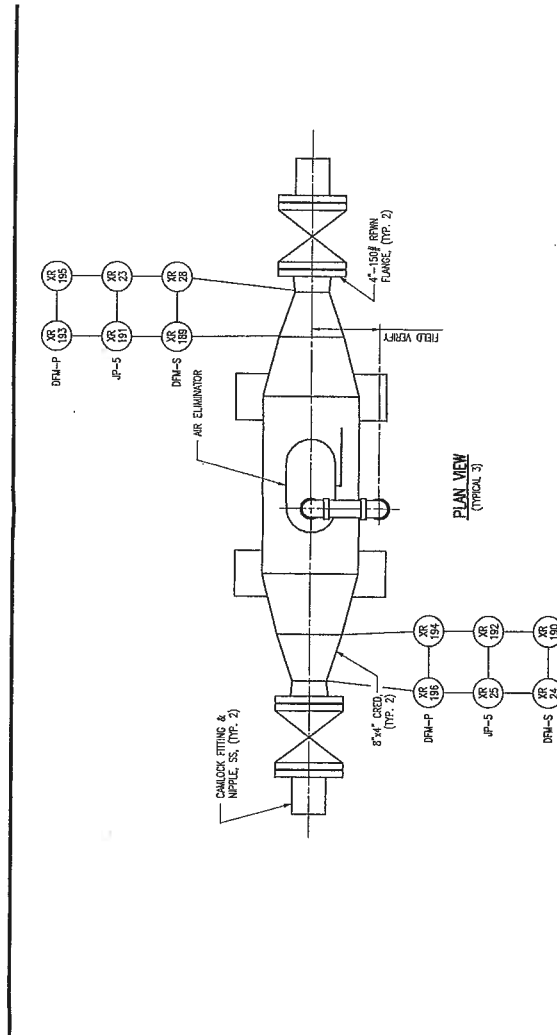
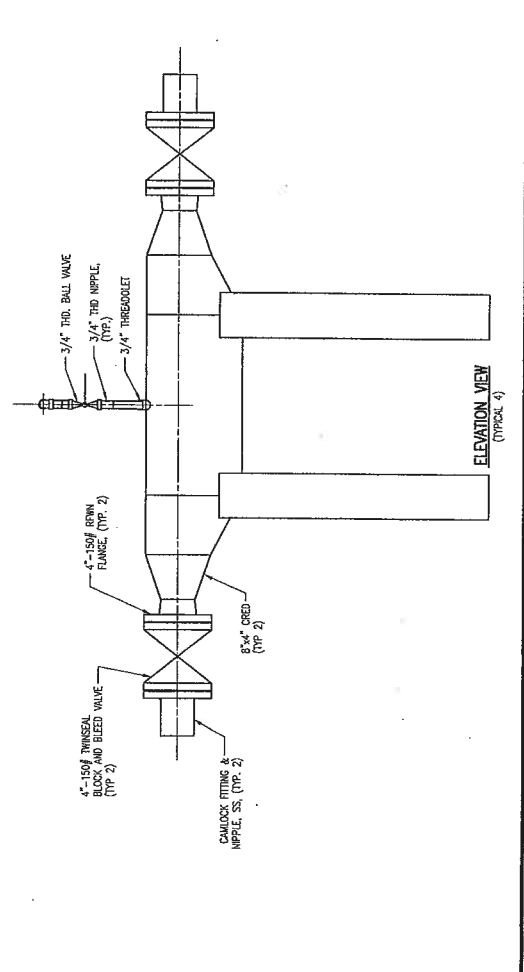
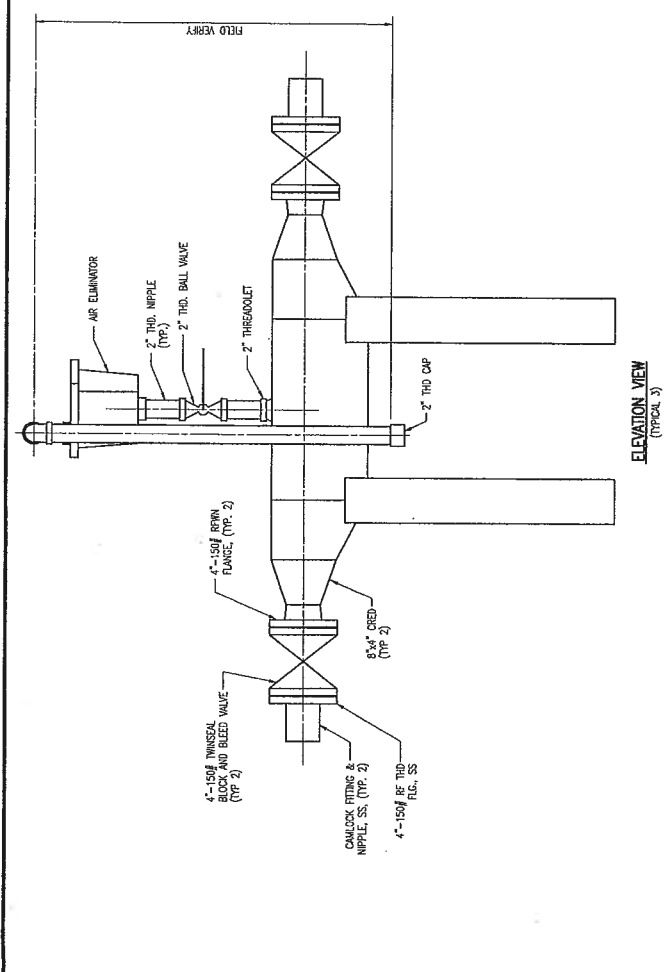
Worley International Inc
 HOUSTON, TEXAS USA

DATE: 12/18/01
 CHECKED: []
 DATE: []
 DRAWN: []
 DATE: []
 REVISION: []
 DATE: []

1 01/09/03 AS-BUILT
 1 12/18/01 APPROVED FOR CONSTRUCTION

DATE: 09 JUN 2003 12:40
 FILE: 055-07074

Worley International Inc
 HOUSTON, TEXAS USA



PIPELINE DRAWINGS
 U.S. NAVY STATION
 PUERTO RICO
 U.S. ARMY ENGINEER BRIGADE HUNTSVILLE
 CORPS OF ENGINEERS
 HUNTSVILLE, ALABAMA
 MOD-5
 VALVE STATION PIER 1
 DFM, DFM-S & JP-5
 DRAWING NO. SK-18-50-012

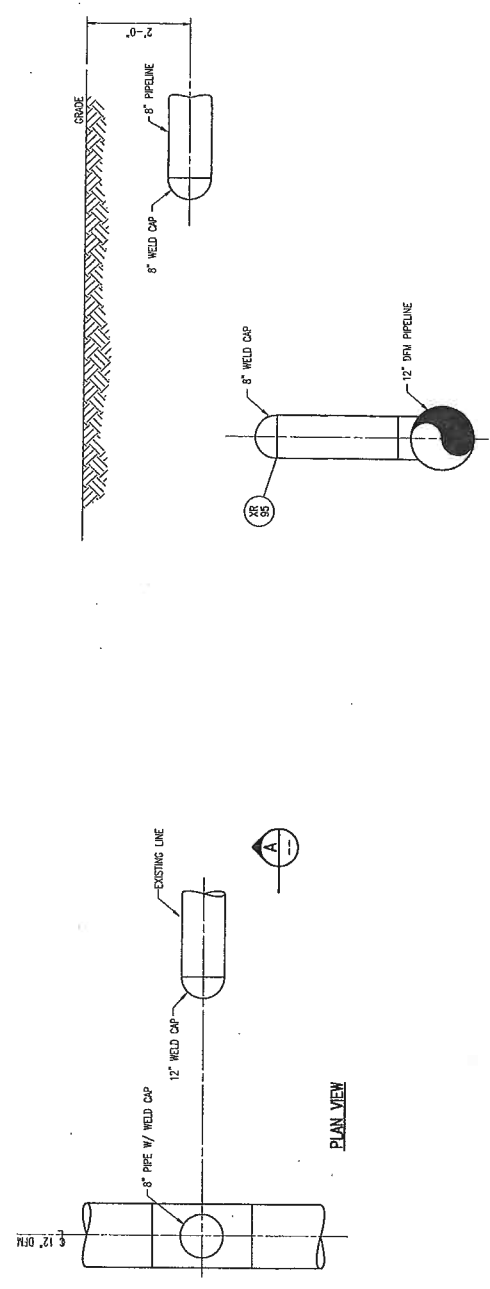
DATE	BY	CHKD	APPV
12/09/01			

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 INFORMATION AND NOT BE
 USED FOR CONSTRUCTION OF THIS
 PROJECT WITHOUT THE WRITTEN APPROVAL
 OF WORLEY INTERNATIONAL, INC.

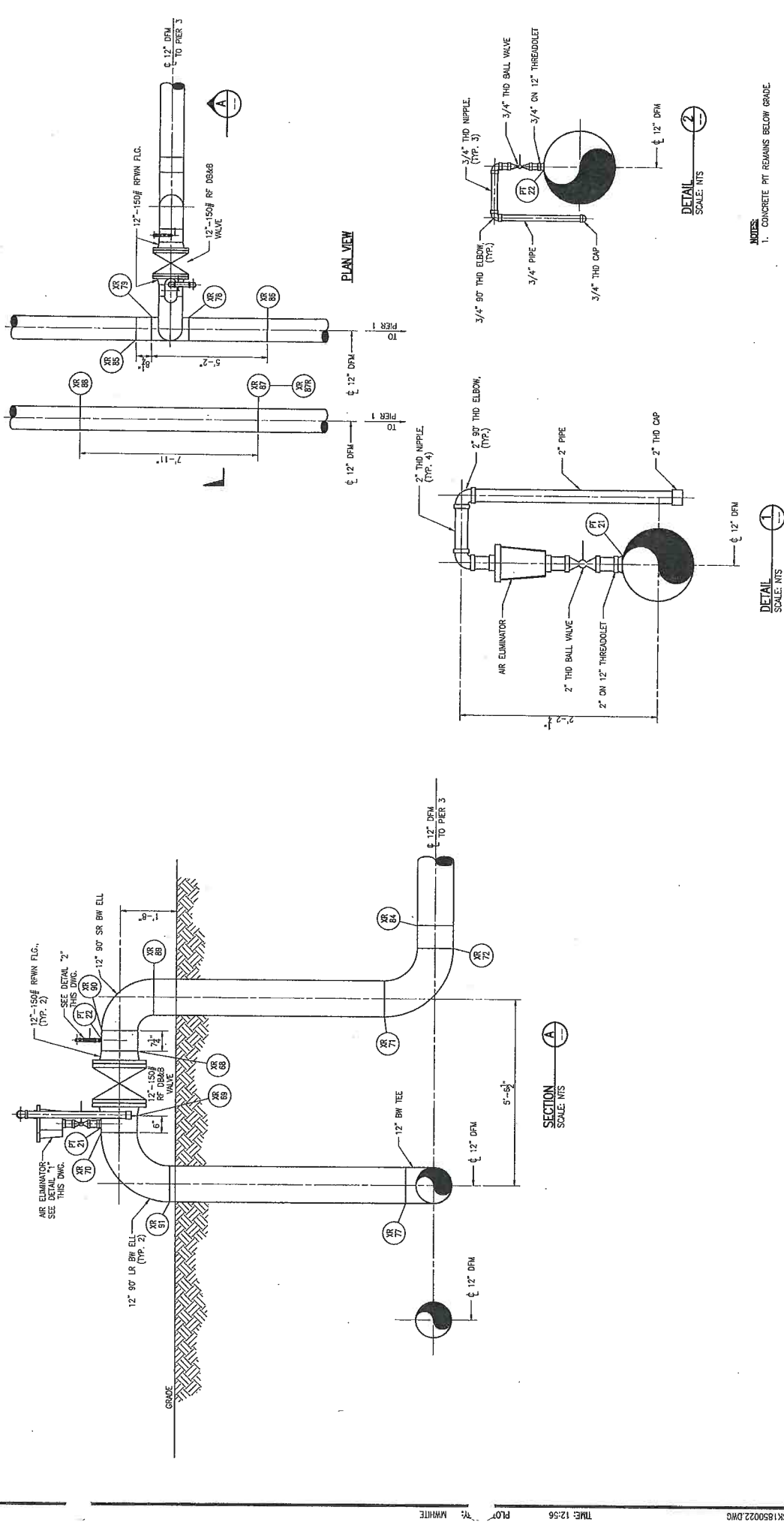
DATE	BY	CHKD	APPV
12/09/01			
01/09/02			
01/25/02			

DATE	BY	CHKD	APPV
01/09/02			
01/25/02			

Worley International Inc
 HUNTSVILLE, ALABAMA
 PROJECT NUMBER: 085-07074
 DATE: 09 JAN 2003
 DRAWING NUMBER: 1246
 SHEET: 1B



NO.	DATE	BY	CHKD	APP'D	DESCRIPTION
1	12/20/01	BTB	BTB	BTB	ISSUED FOR CONSTRUCTION
2	01/17/02	BTB	BTB	BTB	REVISED FOR CONSTRUCTION



NOTES:
 1. CONCRETE PIT REMAINS BELOW GRADE.

PIPELINE DRAWINGS	DATE
U.S. NAVAL STATION	1/2/02
PUERTO RICO	1/2/02
DESIGNED BY	1/2/02
CHECKED BY	1/2/02
ENGINEER	1/2/02
APPROVED DATE	1/2/02
SCALE	1/8" = 1'
TITLE	MOD-10
VALVE PIT #24 - DFM	SHT. 1 OF 2
ENGINEERS	U.S. ARMY ENGINEER DIVISION HUNTSVILLE
CORPS OF ENGINEERS	HUNTSVILLE, ALABAMA
DESIGNER	U.S. ARMY ENGINEER DIVISION HUNTSVILLE
DATE	1/2/02
SCALE	1/8" = 1'
PROJECT NO.	SK-18-50-022
REV	3

DESIGNED BY	1/2/02
CHECKED BY	1/2/02
ENGINEER	1/2/02
APPROVED DATE	1/2/02
SCALE	1/8" = 1'
TITLE	MOD-10
VALVE PIT #24 - DFM	SHT. 1 OF 2
ENGINEERS	U.S. ARMY ENGINEER DIVISION HUNTSVILLE
CORPS OF ENGINEERS	HUNTSVILLE, ALABAMA
DESIGNER	U.S. ARMY ENGINEER DIVISION HUNTSVILLE
DATE	1/2/02
SCALE	1/8" = 1'
PROJECT NO.	SK-18-50-022
REV	3

DESIGNED BY	1/2/02
CHECKED BY	1/2/02
ENGINEER	1/2/02
APPROVED DATE	1/2/02
SCALE	1/8" = 1'
TITLE	MOD-10
VALVE PIT #24 - DFM	SHT. 1 OF 2
ENGINEERS	U.S. ARMY ENGINEER DIVISION HUNTSVILLE
CORPS OF ENGINEERS	HUNTSVILLE, ALABAMA
DESIGNER	U.S. ARMY ENGINEER DIVISION HUNTSVILLE
DATE	1/2/02
SCALE	1/8" = 1'
PROJECT NO.	SK-18-50-022
REV	3

DESIGNED BY	1/2/02
CHECKED BY	1/2/02
ENGINEER	1/2/02
APPROVED DATE	1/2/02
SCALE	1/8" = 1'
TITLE	MOD-10
VALVE PIT #24 - DFM	SHT. 1 OF 2
ENGINEERS	U.S. ARMY ENGINEER DIVISION HUNTSVILLE
CORPS OF ENGINEERS	HUNTSVILLE, ALABAMA
DESIGNER	U.S. ARMY ENGINEER DIVISION HUNTSVILLE
DATE	1/2/02
SCALE	1/8" = 1'
PROJECT NO.	SK-18-50-022
REV	3

Worley International Inc
 065-07074 05 JAN 2003 12:56 28
 DESIGN FILE: H:\07
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 PLOT #3: MHRHE

Worley International Inc
 HOUSTON, TEXAS USA
 PROJECT NUMBER: 085-07074
 DATE: 09 JAN 2003
 SHEET: 1327
 OF: 10

ROAD FREEMAN ENGINEERING SERVICE CENTER
 WASHINGTON NEW YORK
 1435 10th Street, S.E., Suite 3000
 Washington, DC 20034-5800

NO.	DATE	DESCRIPTION	BY	CHECKED
1	01/09/03	AS-BUILT		
2	12/10/03	SUPPLIED FOR CONSTRUCTION		

DATE	BY	DESCRIPTION
7/15/02		DOWN
		CHECKED
		DATE
		ENGINEER
		DATE
		APPROVED
		DATE

SCALE	NTS
DRAWING NO.	SK-18-50-050
REV	1

PIPELINE DRAWINGS
 U.S. MARINE STATION
 PUERTO RICO
 ORIGINAL WORK SUPPLIED BY:
 U.S. ARMY ENGINEER DIVISION, HUNTSVILLE
 CORPUS CHRISTI, TEXAS
 HUNTSVILLE, ALABAMA

NOTES:
 1. CONCRETE PIT BOTTOM REMAINS.



DETAIL
 SCALE: NTS

SECTION
 SCALE: NTS

PLAN VIEW

SECTION

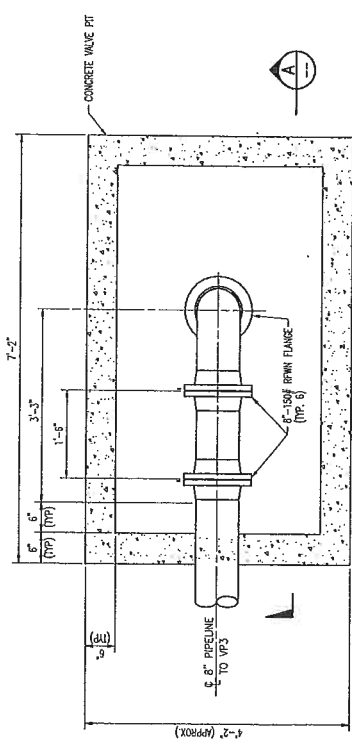
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DETAIL
 SCALE: NTS

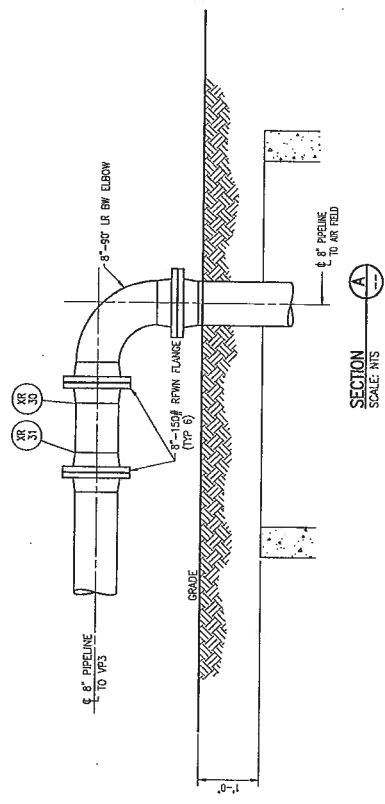
SECTION
 SCALE: NTS

PLAN VIEW

SECTION



PLAN VIEW



SECTION A-A
SCALE: NTS

Worley International Inc
 10000 13th St
 Houston, Texas 77058
 281-462-1000
 065-07074 09 JAN 2003 13:02
 1C
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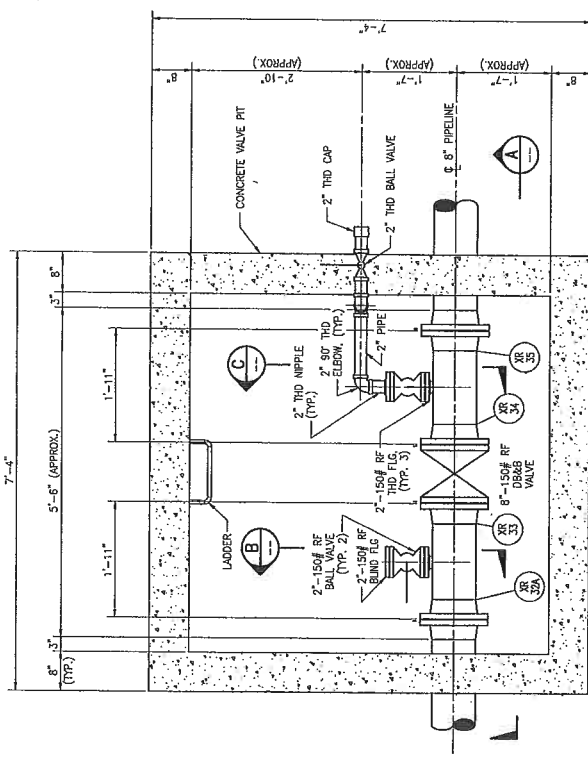
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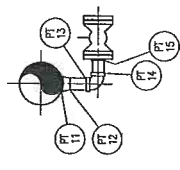
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 10000 13th St
 Houston, Texas 77058
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 065-07074 09 JAN 2003 13:02
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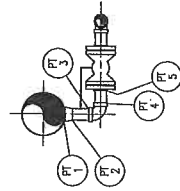
PIPELINE DRAWINGS
 U.S. NAVAL STATION
 PUERTO RICO
 U.S. ARMY ENGINEER DIVISION - HUNTSVILLE
 HUNTSVILLE, ALABAMA
 MOD-13
 VALVE PIT #2
 JP-5
 SK-18-50-032
 REV 1



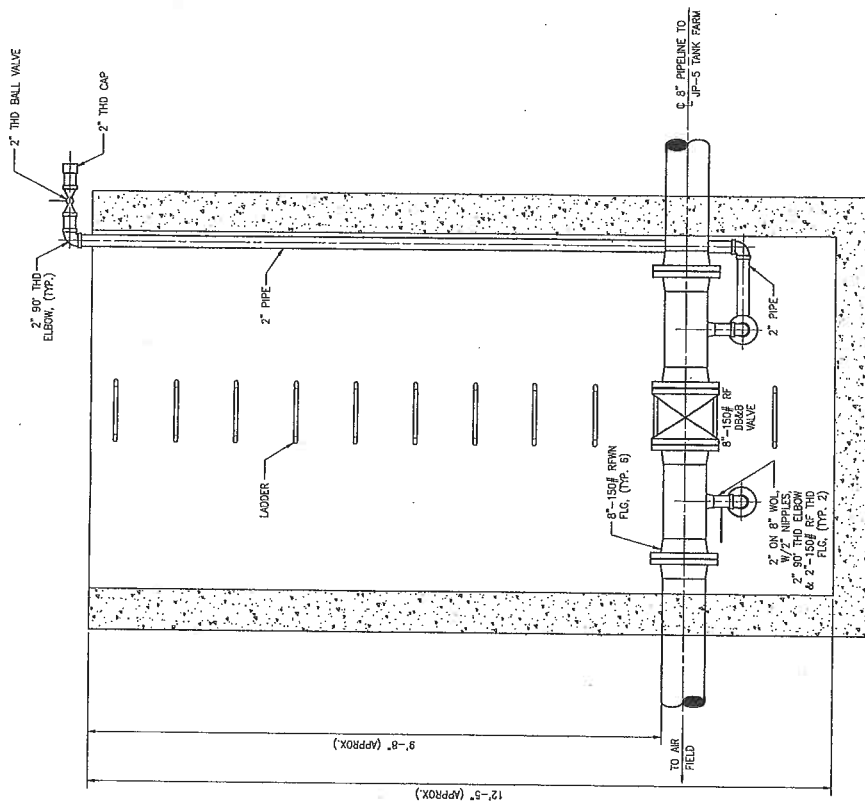
PLAN VIEW



SECTION A-A
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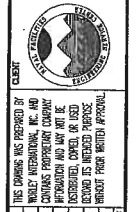
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SCALE: NTS



SECTION A-A
SCALE: NTS

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ORIGINAL DATA SUPPLIED BY:	U.S. ARMY ENGINEER DIVISION HUNTSVILLE ALABAMA
TITLE	MOD-13 VALVE PIT #3 JP-5
DATE	11/5/01
DESIGNED BY	RS
CHECKED BY	RS
DATE	12-20-01
ENGINEER	DAE
DATE	12-20-01
APPROVED DATE	12-20-01
DATE	01-05-02
SCALE	NTS
DRAWING NO.	SK-18-50-034
REV	1

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NO.	DATE	DESCRIPTION
1	10/20/2003	BUILT
2	12/20/2001	APPROVED FOR CONSTRUCTION

Worley
International Inc
HOUSTON, TEXAS USA

LAST UPDATE
09 JAN 2003 13:04

PROJECT NUMBER
065-07074

DESIGN FILE: N-10
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TIME: 13:04
PLOT BY: LHMITE



Worley International Inc
 Houston, Texas, USA

DATE PLOTTED: 09 JAN 2003 13:05
 DRAWING NUMBER: 1A

PROJECT NUMBER: 005-07074

SCALE: NTS

DATE: 11/29/01

PROJECT: MOD-13 VALVE PIT #4 JP-5

CLIENT: U.S. ARMY ENGINEER DIVISION HUNTSVILLE ALABAMA

ENGINEER: [Signature]

DATE: 11/29/01

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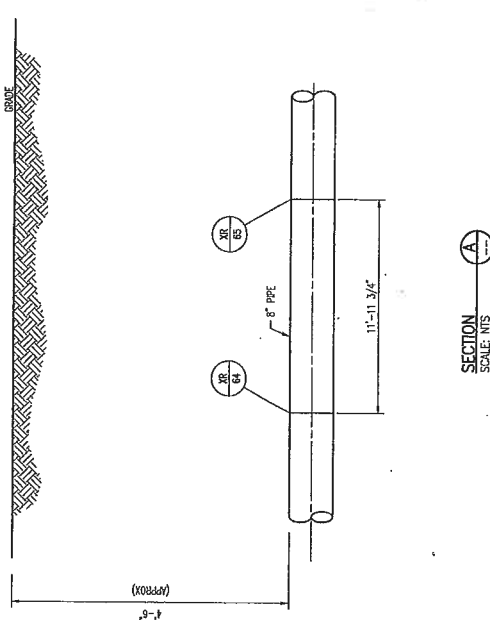
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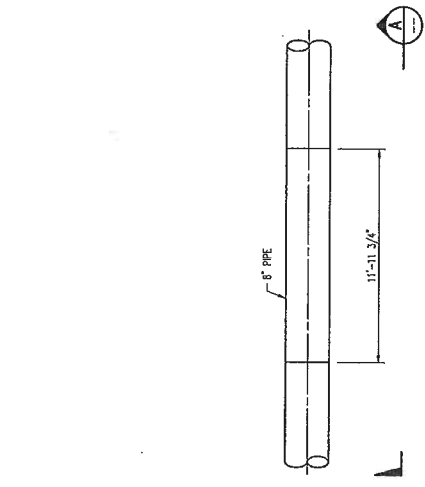
PIPELINE DRAWINGS
 U.S. NAVAL STATION
 PUERTO RICO

ORIGINAL Dwg. SUPPLIED BY:
 U.S. ARMY ENGINEER DIVISION
 HUNTSVILLE, ALABAMA

NOTES:
 1. CONCRETE PIT BOTTOM REMAINS.



SECTION
 SCALE: NTS



PLAN VIEW

NO.	DATE	BY	CHKD	DESCR	REVISION
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0	12/10/01	APPROVED FOR CONSTRUCTION			



Worley International Inc
 Houston, Texas, USA

DATE PLOTTED: 09 JUN 2003 13:14
 PLOT NO: 1A
 SHEET NAME: 09S-07074

DATE: 12/7/01
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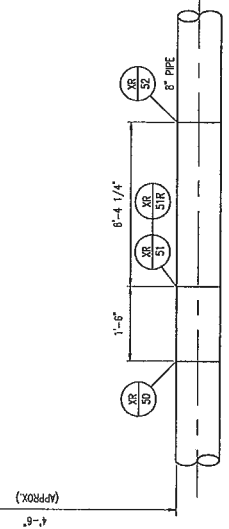
CLIENT: Head Facilities Engineering Service Center
 Washington Navy Yard
 1455 10th Street S.E.
 Washington, DC 20304-5861

PROJECT: MOD-13
 VALVE PIT #5
 JP-5
 DRAWING NO: SK-18-50-038
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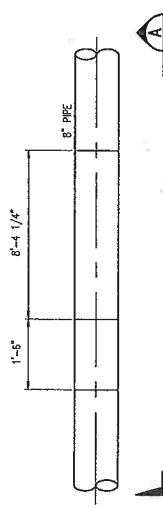
PIPELINE DRAWINGS
 U.S. NAVAL STATION
 PUERTO RICO

ORIGINAL DATA SUPPLIED BY:
 U.S. ARMY CORPS OF ENGINEERS
 HUNTSVILLE, ALABAMA

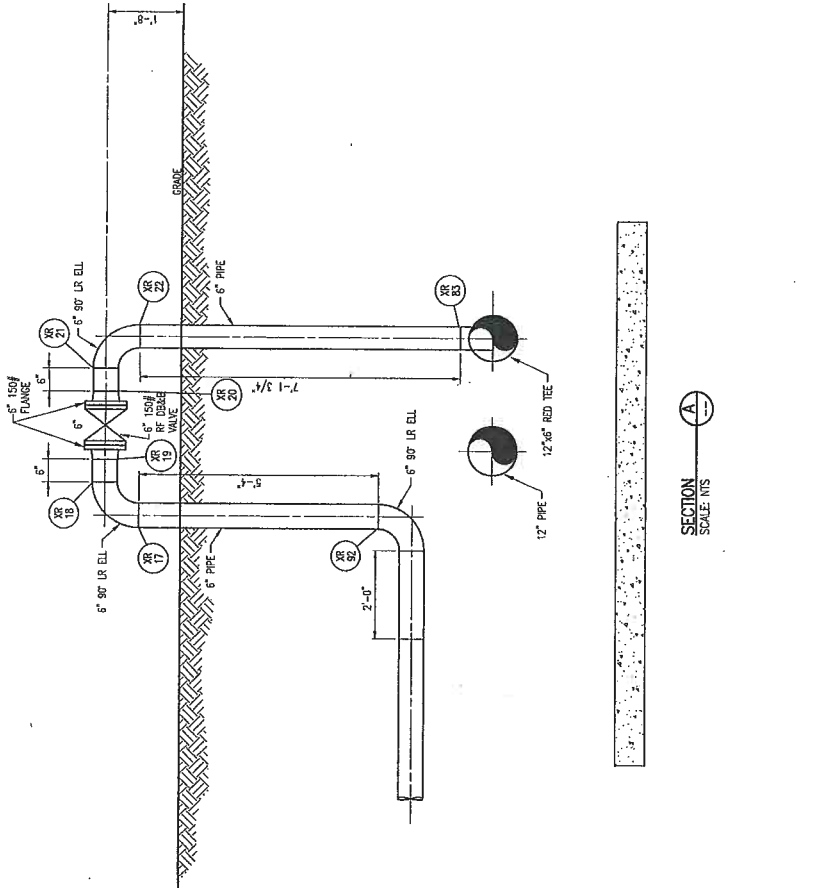
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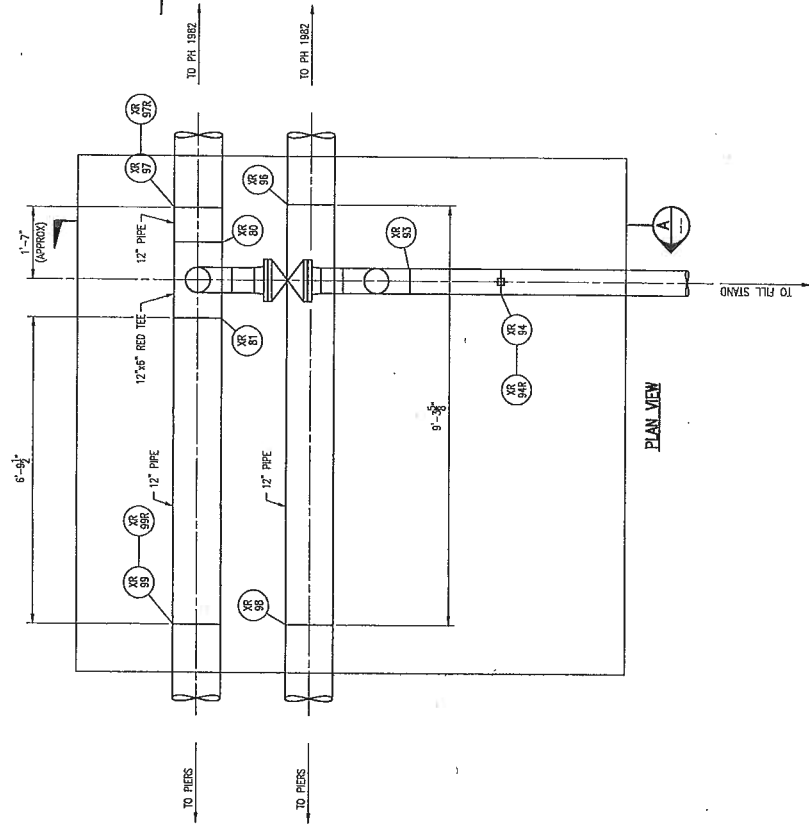
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 SCALE: NTS



PLAN VIEW



SECTION A-A
SCALE: NTS



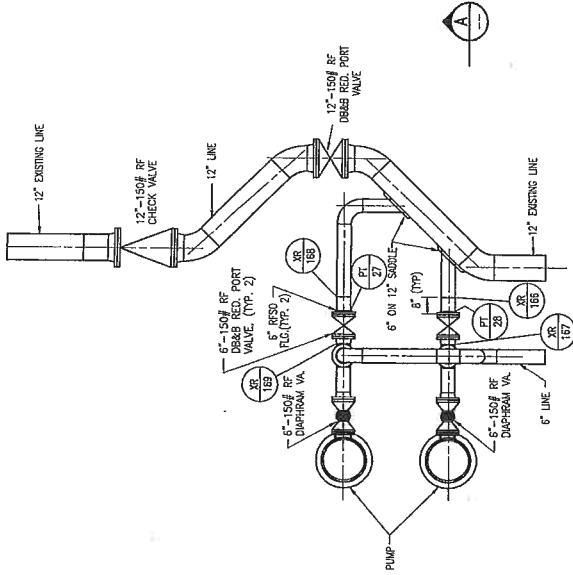
PLAN VIEW

NOTES:
CONCRETE PIT BOTTOM REMAINS

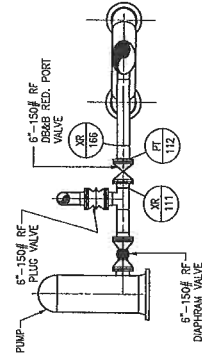
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GENERAL DATA SUPPLIED BY: U.S. ARMY ENGINEER DIVISION, HUNTSVILLE CORPS OF ENGINEERS HUNTSVILLE, ALABAMA	
TITLE MOD-15 VALVE, PIT #56 DFM-P	
SCALE NTS	DRAWING NO. SK-18-50-044

NO.	DATE	BY	CHECKED	DATE
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Worley International Inc
 13223
 09 JUN 2003
 13223
 1C



PLAN VIEW



SECTION
SCALE: NTS



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Worley
Head Facilities Engineering Service Center
Washington Navy Yard
1435 10th Street, S.E.
Washington, DC 20374-3880

NO.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1	7/15/02				ISSUED FOR CONSTRUCTION

NO.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1	7/15/02				ISSUED FOR CONSTRUCTION

NO.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1	7/15/02				ISSUED FOR CONSTRUCTION

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1	7/15/02				ISSUED FOR CONSTRUCTION

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1	7/15/02				ISSUED FOR CONSTRUCTION

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1	7/15/02				ISSUED FOR CONSTRUCTION

NO.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1	7/15/02				ISSUED FOR CONSTRUCTION

NO.	DATE	BY	CHKD.	APP'D.	DESCRIPTION
1	7/15/02				ISSUED FOR CONSTRUCTION

PIPELINE DRAWINGS
U.S. MARINA STATION
PUERTO RICO

ORIGINAL DATA SUPPLIED BY:
U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
HUNTSVILLE, ALABAMA

MOD 15
6" VALVE REPLACEMENT
JP-5 TANK 381

SCALE: NTS
DRAWING NO.: SK-18-50-055
REV: 0

DATE: 7/15/02
CHECKED: [Signature]
DATE: [Date]
DRAWN: [Signature]
DATE: [Date]
APPROVED: [Signature]
DATE: [Date]

Worley International Inc
13500 West 10th Avenue
Denver, CO 80202

Worley International Inc
13500 West 10th Avenue
Denver, CO 80202

Worley International Inc
13500 West 10th Avenue
Denver, CO 80202

Worley International Inc
13500 West 10th Avenue
Denver, CO 80202

Worley International Inc
13500 West 10th Avenue
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Worley International Inc
13500 West 10th Avenue
Denver, CO 80202

Worley International Inc
13500 West 10th Avenue
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13500 West 10th Avenue
Denver, CO 80202

Worley International Inc
13500 West 10th Avenue
Denver, CO 80202

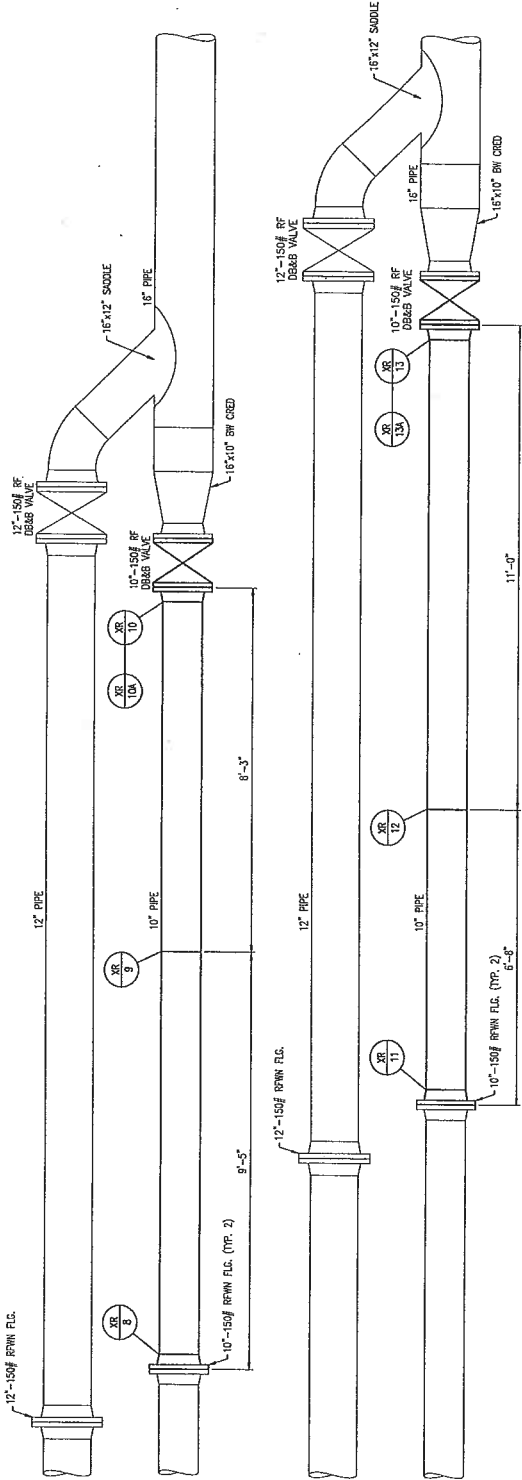
Worley International Inc
13500 West 10th Avenue
Denver, CO 80202

Worley International Inc
13500 West 10th Avenue
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Worley International Inc
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Denver, CO 80202

Worley International Inc
13500 West 10th Avenue
Denver, CO 80202



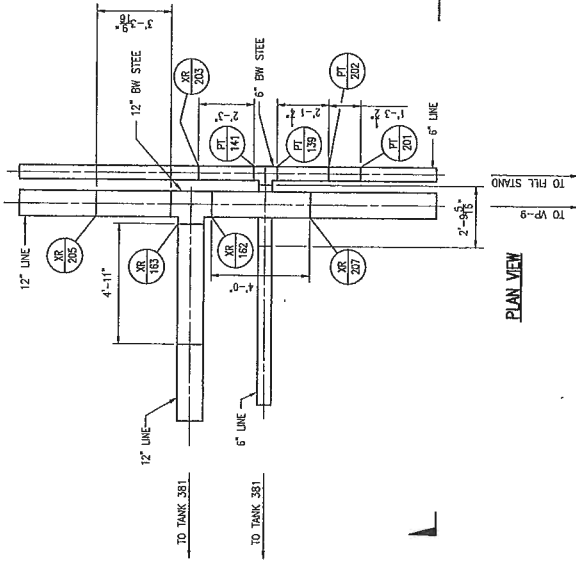
PIPING PLAN

PIPELINE DRAWINGS	
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DATE	8/15/02
DESIGNED BY	SPR
CHECKED	DATE
ENGINEER	DATE
APPROVED	DATE
SCALE	NTS
TITLE	MOD 15 PH-1982 METER RUNS JP-5
DATE	8/15/02
PROJECT	U.S. ARMY ENGINEER DESIGN HUNTSVILLE CORPS OF ENGINEERS HUNTSVILLE, ALABAMA
CLIENT	Head Facilities Engineering Service Center Washington Navy Yard 1155 10th Street, SW Washington, DC 20379-3825
DESIGNER	Worley International Inc.
DRAWN	Worley International Inc.
CHECKED	Worley International Inc.
ENGINEER	Worley International Inc.
APPROVED	Worley International Inc.
DATE	8/15/02

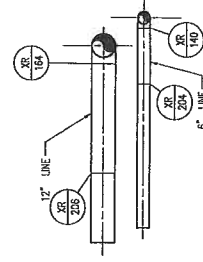
Worley International Inc
HOUSTON, TEXAS USA

PROJECT NUMBER: 085-07074
DATE: 09 JAN 2003
TIME: 13:51

DESIGN FILE: H:\085\7074\18\DRAWINGS\50\SK185062.DWG
PLOT DATE: 09 JAN 03
PLOT TIME: 13:51
PLOTTED BY: MMHTE



PLAN VIEW



SECTION
SCALE: NTS

NOTE:
CONCRETE PIT BOTTOM REMAINS.

PIPELINE DRAWINGS
U.S. NAVAL STATION
PUERTO RICO

ORIGINAL DATA SUPPLIED BY:
U.S. ARMY ENGINEER DIVISION HUNTSVILLE
CORPS OF ENGINEERS
HUNTSVILLE, ALABAMA

TITLE
MOD 18
VALVE PIT 9A
JP-5
DRAWING NO. SK-18-50-057-0
SCALE NTS

DESIGNED BY: 7/15/02
CHECKED BY:
ENGINEER:
APPROVED DATE:



Newel Facilities Engineering Service Center
Washington Navy Yard
1435 10th Street S.E., Suite 3000
Washington, DC 20374-5003

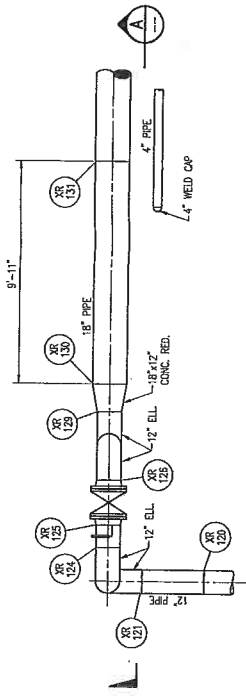
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NO.	DATE	BY	DESCRIPTION	REVISED DATE
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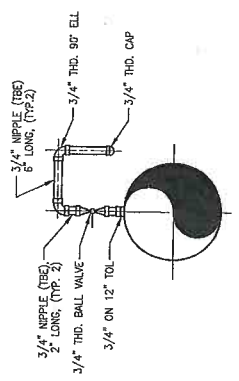
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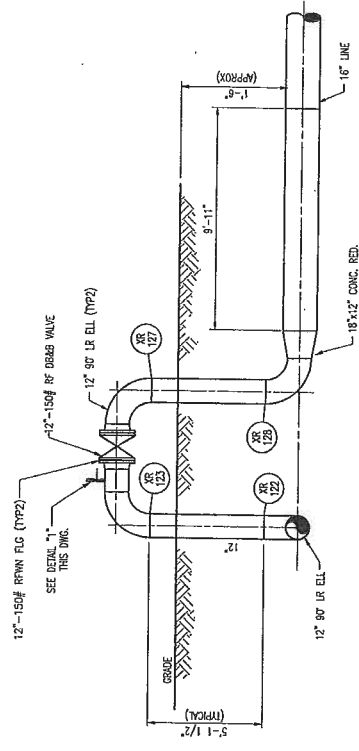
Worley International Inc.
INTERNATIONAL, TENDS, USA
1344 S
065-0707A
09 JUN 2003
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065-0707A
09 JUN 2003



PLAN VIEW



DETAIL
SCALE: NTS



SECTION
SCALE: NTS

NOTES:
CONCRETE PIT BOTTOM REMAINS

PIPELINE DRAWINGS
SITE U.S. NAVAL STATION PUERTO RICO
ORIGINAL DRAW SUPPLIED BY: ENGINEER DIVISION HUNTSVILLE CORPS OF ENGINEERS HUNTSVILLE, ALABAMA
PROJECT NO. MOD 19 VALVE PIT #8 DFM-P
DRAWN BY DATE CHECKED DATE APPROVED DATE
SCALE NTS
PROJECT NO. 8719/02
DATE 8/19/02
DESIGNER DATE
APPROVED DATE



Level Location Engineering Service Center
Washington Navy Yard
1405 10th Street S.E.
Washington, DC 20374-5653

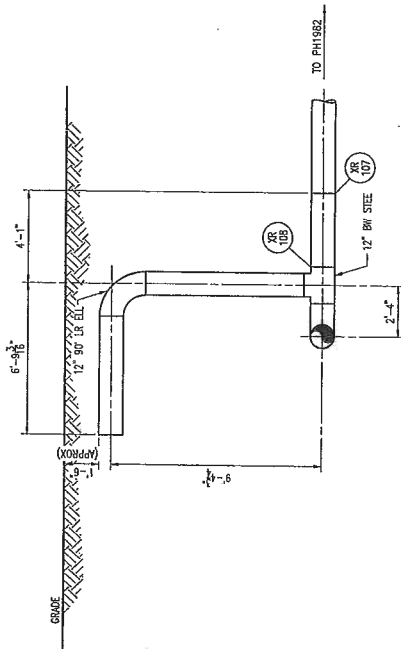
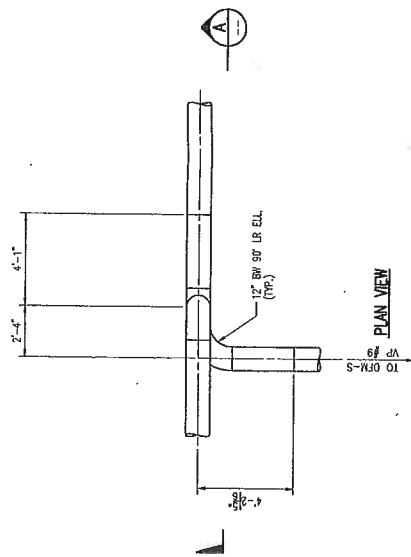
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NO.	DATE	DESCRIPTION	BY	CHECKED
1	8/19/02	ISSUED FOR CONSTRUCTION	JMF	JMF

DATE	8/19/02	BY	JMF	CHECKED	JMF
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Worley International Inc
Houston, Texas USA

PROJECT NUMBER: 065-07074 | DATE: 09 JAN 2003 | TIME: 13:29 | TC



SECTION
SCALE: NIS

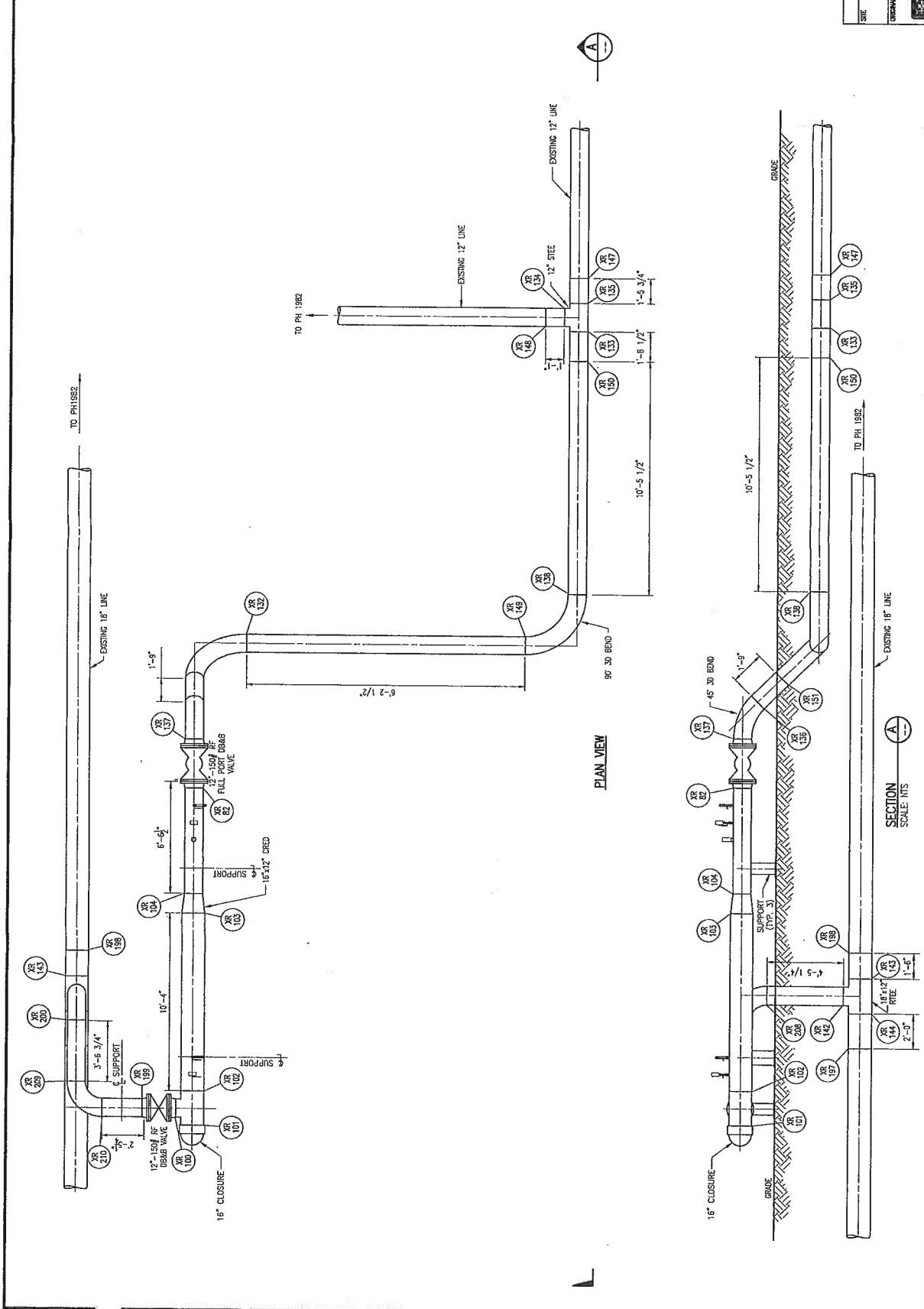
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PIPELINE DRAWINGS U.S. NAVAL STATION PUERTO RICO		ORIGINAL DATA SUPPLIED BY: U.S. ARMY ENGINEER DIVISION HUNTSVILLE CORPS OF ENGINEERS HUNTSVILLE, ALABAMA		MOD 20 VALVE PT #8 DFM VALVE REMOVAL	
SHEET	NO.	SCALE	NIS	DATE	8/19/02
THE DRAWING WAS PREPARED BY WOLLEY INTERNATIONAL, INC. AND CHECKED BY: ENGINEER OF RECORD RECORD IS NEGATED WITHOUT WITHOUT FURTHER WRITTEN APPROVAL		CLIENT NEW FACILITIES ENGINEERING SERVICE CENTER WASHINGTON ARMY YARD 1415 BENTLEY AVENUE WASHINGTON, DC 20314-5053		DRAWN BY DATE CHECKED BY DATE INCHES DATE	
WOLLEY INTERNATIONAL, INC. 13354 HOUSTON, TEXAS USA		PROJECT NUMBER 085-07074		SHEET NUMBER 13354-08	
DATE 08 JAN 2003		DRAWING NUMBER SK-18-50-052		TITLE DFM VALVE REMOVAL	



Worley International Inc.
 13354
 HOUSTON, TEXAS USA
 PROJECT NUMBER: 085-07074
 DATE: 08 JAN 2003
 SHEET NUMBER: 13354-08
 DRAWING NUMBER: SK-18-50-052



PIPELINE DRAWINGS	
SIB	
U.S. NAVAL STATION PUERTO RICO	
GENERAL DATA SUPPLIED BY:	
U.S. ARMY ENGINEER DIVISION HUNTSVILLE CORPS OF ENGINEERS HUNTSVILLE, ALABAMA	
TITLE	
PIG LAUNCHER / RECEIVER	
PH 1982	
JP-5	
SCALE	NTS
DRAWING NO.	SK-18-50-053

DATE	9/16/72
DESIGNED	
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REVISION	
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 PERLEY INTERNATIONAL, INC. AND
 CONSULTING ENGINEERING SERVICE CENTER
 WASHINGTON ARMY AND AIR FORCE
 ENGINEERING CENTER, WASHINGTON, DC
 FOR THE U.S. ARMY ENGINEER DIVISION
 HUNTSVILLE, ALABAMA
 WITHOUT PRIOR WRITTEN APPROVAL

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Worley International Inc
 INTERNATIONAL ENGINEERING
 HOUSTON, TEXAS, USA

PROJECT NUMBER: 005-07074
 DATE: 08 JAN 2003
 15:38 08

SCALE: NTS

DATE: 9/16/72

DESIGNED: []

CHECKED: []

DRAWN: []

DATE: []

REVISION: []

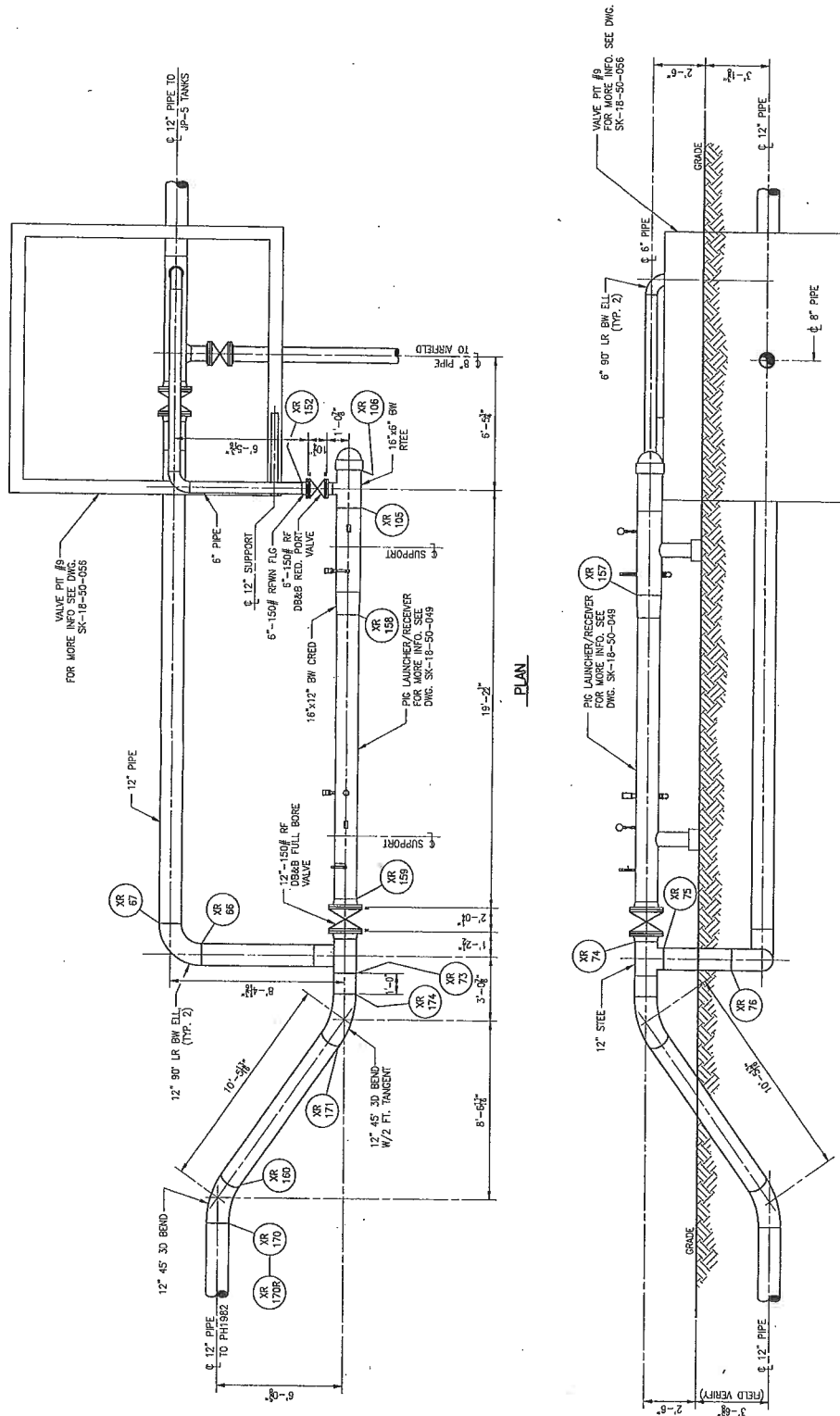
DATE: []

NO. 407

SCALE: NTS

DRAWING NO. SK-18-50-053

79410 ymimvna3v9k1scuau3.wm
 TIME: 13:38
 BR: MWHITE
 PL:



PLAN

ELEVATION

PIPELINE DRAWINGS
 U.S. NAVAL STATION
 PUERTO RICO

ORIGINAL DATA SUPPLIED BY:
 U.S. ARMY ENGINEER DIVISION, HUNTSVILLE
 CORPS OF ENGINEERS
 HUNTSVILLE, ALABAMA

PIG LAUNCHER/RECEIVER
 JP-5 TANK FARM
 JP-5

SCALE: NTS
 DRAWING NO. SK-18-50-054

NO.	DATE	BY	CHKD.	APP'D.
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Worley International Inc
 HOUSTON, TEXAS, USA

DATE: 08 JAN 2003
 TIME: 13:40
 DRAWING NO: 05-07074

PROJECT: 05-07074
 SHEET: 1340
 OF: 03



J-07 Manufacturers Certificate of Compliance - Pipe

Gulf States Tube Vision Metals

ISO 9002
CERTIFIED

P.O. BOX 822
ROSENBERG, TEXAS 77471
(713) 342-5401
800-231-5584

ORDER NUMBER	CUSTOMER ORDER NUMBER	DATE	DPC	OOM	DI WI	NET SLS	GR SLS	ACCOUNT NUMBER	US	PAG
025291	6909	11/30/00	21	00	16	20	01	00172007DPD	BP	PAV

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WILL ADVISE
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INV

ROUTING

COL	CUST TRK	TR V/SHRT	PRODUCT	FC	HEAT TREATMENT	RELEASED
PER SPEC	ROUND	NOT FINISH			PER SPEC	WK 11-30-00
SEAMLESS	ASTM/ASME A/SA 106 B 97A	WF CARBON PIPE A106				11/30/00

SPECIAL INSTRUCTIONS:

MATERIAL MEETS REQUIREMENTS OF ASTM/ASME A/SA-53B, A106B, AP15LB
PLAIN ENDS
UVG COATED
ACCEPTABLE PER NACE MRO 175-00 TABLE 5
~~PERMISSIBLE OVERAGES ACCEPTABLE~~

ITEM	QUANTITY	O.D.	I.D.	WALL	LENGTH	WT/FT	WEIGHT	REMARKS
1	10,240'	1.315		.133 AVG	RAND 17' 24'	1.679	17,193	Complete 460 Pcs. 10,513'

SHIPPING NOTE: NO TRUCKS ACCEPTED AFTER 3:00 P.M.

MILL TEST REPORTS
FOR PO # 12491

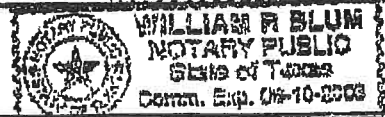
HEAT NO.	C	Mn	P	S	SI	NI	Cr	Mo	Cu	Pb	REMARKS
75492 ✓	.20	.84	.008	.008	.15	.08	.08	.02	.18		V .002
	.20	.84	.007	.008	.15	.08	.08	.02	.18		V .002

HEAT NO.	ULT. STR. PSI	YIELD PSI	ELONG 2"	HARDNESS	HEAT NO.	ULT. STR. PSI	YIELD PSI	ELONG 2"	HARDNE
75492	79420	54800	45.5						

OTHER TESTS

FLATTEN FLARE FLANGE REV. FLATTEN HYDRO TEST BEND EDDY CURRENT

2500 Psi OK OK



I CERTIFY THAT THE MATERIAL HEREIN DESCRIBED HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE ORDERED SPECIFICATION AND THAT THIS TEST INFORMATION IS CORRECT AS CONTAINED IN THE RECORDS OF THE COMPANY.

DAVE HUBENAK
TECHNICAL ANALYST

SWORN TO AND SUBSCRIBED BEFORE ME THIS
30 DAY OF November 2000
William R. Blum
NOTARY PUBLIC



Wheatland Tube Company

Wheatland Division

*** CERTIFICATE OF COMPLIANCE ***

April 10, 2000

[REDACTED]

[REDACTED]

RE: CUSTOMER ORDER NO.
6729

REGISTER NO.
W011440-002
40-0798-00

To Whom It May Concern:

This is to certify the Standard Weight and Extra Heavy Weight Black or Galvanized Steel Pipe and Couplings produced by the WHEATLAND TUBE COMPANY at Wheatland, Pennsylvania, U.S.A. All items that have been stenciled as A53 have been tested, inspected and comply with the applicable provisions of the ASTM Standard Specification A-53-96 Type F Grade A and also with the requirements set forth in Federal Specification WWP 404 and ANSI B6.10.

Threaded couplings have also been tested, inspected and comply with the applicable provisions of ASTM Standard Specification A865, Threaded Couplings for use in steel pipe.

Richard F. McKee
Manager Quality Control

This certificate of compliance is issued expressly and exclusively for the above customer order number, register number or project number and is not to be altered in any manner whatsoever.

12791

1950

7100015000 Page 1 of 1



LONE STAR STEEL COMPANY
 P.O. BOX 1000, HWY. 159 S., LONE STAR, TX 75688

MATERIAL TEST REPORT

ISO 9001 REGISTERED QUALITY SYSTEM

Page 1 of 1
 Print Date: 12/01/2000
 Serial #: 200025891

LSO: 0115970
 Item: 1
 Heat: 63991
 Lot: 01

Product:
 2 7/8" J.66 A538B
 .154" Wall
 PE-BBV RG 3(21 -0*1+6") CTD
 ASTM A53-99B GRADE B ERW.
 MANUFACTURED IN THE USA

Customer Order:
 Customer Resource:
 Customer Specifications:

Sold to:
TEX-TUBE COMPANY
 C/O T&H WAREHOUSE
 BOND
 TX

Ship to:
 MTR Copies
 Sold To: 1
 Ship To: 0

P.O. BOX 55768
 HOUSTON TX 77255

CHEMICAL ANALYSIS, %

	C	Mn	P	S	Si	Cu	Ni	Cr	Mg	Su	Al	V	B	Cu	Ti	Ca	N	O	CHQ	DA	P&M
Heat	.23	.82	.005	.007	.08	.05	.03	.059	.045	.002	.024	.002	.0002	.002	.001	.0008	.0053	.0024			
Check	.24	.83	.005	.008	.09	.04	.02	.061	.049	.003	.028	.002	.0002	.002	.001	.0013					
Check	.24	.83	.005	.008	.09	.04	.02	.060	.049	.000	.026	.002	.0001	.001	.001	.0011					

MECHANICAL PROPERTIES

Test	Dir	Loe	Natch	Tensile		Elong % in 2"	Area Red	Y/T Ratio	Grain size Martensitic % Collapse, PSI Hydrotest, PSI Flattening	RR-1 RR-2 RR-3
				Yield KSI	Tensile KSI					
1	L	B	N	44.4	74.6	38.0		.595		
2										
3										
4										

Impact Tests

Test	Dir	Loe	Size	Temp	Energy	%Shear	LatExp	Scale	O.D.	M.W.	I.D.	Var	Body	Weld	HAZ	Stud
1																
2																
3																
4																

Remarks

Inspections Performed
 VISUAL
 ULTRASONIC WELDLINE

Tests were performed in accordance with one or more of the following test methods: 81, 84, 88, 89, 90, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

From the Office of:
D. J. Hanson, Jr.
 Director of Quality

**MILL TEST REPORTS
 FOR PO # 10271**

This is to certify that the product described herein was manufactured, sampled, tested, and/or inspected in accordance with the specifications, and fills the requirements in such respects

5018096

00080301



Invoice:

Purchase Order: 7085

Item Number

Description

3B4237L21P

ASTM A53B 4-1/2" X.237"
WALL (10.80#) LAC, 21' UF, PE 10.8000 LB

* Heat #:120356

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	Ci
L	0.160	0.720	0.020	0.008	0.000	0.000	0.000	0.000	0.020	0.000	0.000	0.000	.00
C	0.172	0.680	0.020	0.010	0.022	0.017	0.022	0.010	0.022	0.032	0.001	0.001	.21
C	0.166	0.680	0.020	0.009	0.021	0.017	0.023	0.010	0.021	0.033	0.001	0.001	.21

Mechanical Properties (ksi):

YS: 56.70 TS: 68.90 EL: 33% HRB: 80

* Heat #:121035

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	Ci
L	0.150	0.730	0.014	0.008	0.000	0.000	0.000	0.000	0.030	0.000	0.000	0.000	.0
C	0.177	0.670	0.028	0.009	0.025	0.024	0.018	0.012	0.025	0.026	0.001	0.001	.3
C	0.170	0.660	0.021	0.010	0.023	0.017	0.021	0.010	0.020	0.030	0.001	0.001	.2

Mechanical Properties (ksi):

YS: 58.30 TS: 70.00 EL: 30% HRB: 81

* Heat #:213401

Chem Analysis (%):

* Heat #: 213401 *

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.156	0.700	0.025	0.013	0.010	0.010	0.010	0.003	0.017	0.055	0.002	0.000	
C -	0.157	0.730	0.030	0.012	0.005	0.011	0.004	0.009	0.024	0.039	0.002	0.001	.28
C -	0.148	0.740	0.044	0.017	0.006	0.013	0.004	0.010	0.024	0.056	0.001	0.002	.28

Mechanical Properties (ksi):

YS: 49.10 TS: 61.50 EL: 33% HRB: 79

* Heat #: 2A8252 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.060	0.850	0.007	0.007	0.010	0.020	0.020	0.004	0.170	0.038	0.004	0.018	.00
C -	0.060	0.890	0.006	0.009	0.016	0.020	0.015	0.013	0.183	0.029	0.002	0.022	.11
C -	0.061	0.910	0.006	0.007	0.012	0.020	0.011	0.013	0.184	0.033	0.004	0.019	.12

Mechanical Properties (ksi):

YS: 63.70 TS: 69.60 EL: 29% HRB: 82

* Heat #: 915920 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.130	0.780	0.015	0.011	0.010	0.010	0.010	0.000	0.040	0.048	0.000	0.000	.00
C -	0.145	0.830	0.020	0.013	0.011	0.012	0.014	0.011	0.024	0.040	0.001	0.002	.29
C -	0.144	0.830	0.021	0.013	0.012	0.012	0.014	0.012	0.024	0.040	0.001	0.002	.29

Mechanical Properties (ksi):

YS: 52.00 TS: 64.00 EL: 29% HRB: 78

* Heat #: 915921 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.140	0.750	0.016	0.013	0.010	0.010	0.010	0.000	0.030	0.034	0.000	0.000	
C -	0.140	0.770	0.020	0.015	0.014	0.010	0.012	0.011	0.019	0.031	0.001	0.002	.27
C -	0.142	0.780	0.021	0.014	0.014	0.010	0.012	0.011	0.021	0.032	0.001	0.001	.26

Mechanical Properties (ksi):

YS: 51.00 TS: 61.80 EL: 29% HRB: 79

810045

 * Heat #: 927737 *

 * Heat #: 927737 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.150	0.780	0.017	0.009	0.010	0.010	0.010	0.000	0.040	0.020	0.000	0.000	.00
C -	0.132	0.800	0.024	0.012	0.011	0.010	0.012	0.010	0.024	0.012	0.002	0.002	.27
C -	0.148	0.830	0.022	0.013	0.012	0.012	0.013	0.011	0.028	0.022	0.002	0.002	.29

Mechanical Properties (ksi):

YS: 55.40 TS: 66.70 EL: 33% HRB: 78

 * Heat #: 927738 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.130	0.700	0.020	0.010	0.010	0.010	0.010	0.000	0.040	0.036	0.000	0.000	.27
C -	0.141	0.760	0.026	0.012	0.010	0.011	0.012	0.010	0.027	0.029	0.002	0.001	.28
C -	0.144	0.760	0.027	0.013	0.011	0.011	0.012	0.010	0.027	0.029	0.001	0.002	.28

Mechanical Properties (ksi):

YS: 48.70 TS: 60.40 EL: 29% HRB: 79

 * Heat #: C10357 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.130	0.380	0.012	0.007	0.010	0.030	0.020	0.010	0.007	0.049	0.000	0.000	.00
C -	0.135	0.400	0.018	0.012	0.009	0.033	0.015	0.007	0.012	0.049	0.001	0.001	.21
C -	0.135	0.400	0.019	0.012	0.009	0.034	0.016	0.007	0.010	0.050	0.001	0.002	.21

Mechanical Properties (ksi):

YS: 53.30 TS: 63.70 EL: 32% HRB: 78

Comments

HYDROSTATIC TEST PRESSURE (psi): 2,000
 1" STRIP SPECIMEN.
 THIS MATERIAL MEETS ASTM A53-98 GRADE B SPEC.

ASME SA-53-B

Comments

THIS MATERIAL MEETS ASME SA-53-B SPEC.
THIS MATERIAL IS ERW PIPE.
FLATTENING TEST OK.
THIS MATERIAL WAS MANUFACTURED IN THE U.S.A..
THIS MATERIAL IS IN COMPLIANCE WITH NACE STANDARD MR-01-75-94.

MILL TEST REPORTS
FOR PO # 12791



The above analyses and tensile properties
are correct to the best of my knowledge
and belief.

Originals to Follow

10/30/2001

5019166

Invoice:

Purchase Order: 161

Item Number

Description

3B4237L21P

ASTM A53B 4-1/2" X.237"
 WALL (10.80#) LAC, 21'UF, PE 10.8000 LB

 * Heat #:917743 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	0.160	0.880	0.017	0.018	0.010	0.010	0.010	0.000	0.250	0.026	0.000	0.000	
C	0.144	0.980	0.015	0.011	0.002	0.011	0.015	0.009	0.269	0.020	0.001	0.002	.31
C	0.147	0.940	0.015	0.012	0.002	0.011	0.015	0.010	0.260	0.020	0.001	0.002	.31

Mechanical Properties (ksi):

YS: 60.90 TS: 73.00 EL: 32% HRB: 86

 * Heat #:929675 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	0.150	0.900	0.020	0.014	0.010	0.010	0.010	0.000	0.014	0.033	0.000	0.000	.00
C	0.159	0.900	0.018	0.011	0.009	0.013	0.015	0.010	0.289	0.027	0.001	0.002	.32
C	0.169	0.870	0.019	0.013	0.009	0.013	0.015	0.010	0.277	0.022	0.001	0.002	.32

Mechanical Properties (ksi):

YS: 59.70 TS: 72.60 EL: 32% HRB: 81

 * Heat #:933417 *

Chem Analysis (%):



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CLUBHOUSE FAX Purchase Order: 161
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 * Heat #: 933417 *

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	0.140	0.800	0.019	0.013	0.010	0.010	0.010	0.000	0.220	0.018	0.000	0.000	.00
C	0.129	0.850	0.019	0.008	0.002	0.012	0.015	0.009	0.214	0.013	0.001	0.002	.28
C	0.133	0.840	0.019	0.008	0.002	0.012	0.015	0.009	0.214	0.013	0.001	0.002	.28

Mechanical Properties (ksi):
 YS: 61.70 TS: 72.40 EL: 32% HRB: 82

 * Heat #: 93341B *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	0.140	0.760	0.016	0.013	0.010	0.010	0.010	0.000	0.250	0.027	0.000	0.000	.00
C	0.137	0.780	0.015	0.009	0.002	0.010	0.015	0.008	0.244	0.022	0.001	0.002	.27
C	0.136	0.770	0.015	0.008	0.003	0.010	0.015	0.009	0.241	0.022	0.001	0.002	.27

Mechanical Properties (ksi):
 YS: 59.80 TS: 69.00 EL: 30% HRB: 81

HYDROSTATIC TEST PRESSURE (psi): 3,000
 1" STRIP SPECIMEN.
 THIS MATERIAL MEETS ASTM A53-98 GRADE B SPEC.
 THIS MATERIAL MEETS ASME SA-53-B SPEC.
 THIS MATERIAL IS ERW PIPE.
 FLATTENING TEST OK.
 THIS MATERIAL WAS MANUFACTURED IN THE U.S.A..
 THIS MATERIAL IS IN COMPLIANCE WITH NACE STANDARD MR-01-75-94.

MILL TEST REPORTS
 FOR PO # 12791

The above analyses and tensile properties are correct to the best of my knowledge and belief.

James Landry
 Quality Control Dept



P.O. BOX 55710
 HOUSTON, TEXAS 77255-5710
 (713) 686-4351 PHONE
 (713) 685-2222 FAX
 www.tex-tube.com

Certificate Of Tests

SO18095

[REDACTED]

Invoice: Purchase Order: 7085

Item Number	Description	
3EB322L21P	ASTM A53B 8-5/8" X.322" WALL (28.58#) LAC, 21'UF, PE	28.5800 LB

 * Heat #: 918774 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	0.160	0.720	0.016	0.012	0.010	0.010	0.010	0.000	0.300	0.040	0.000	0.000	
C	0.153	0.750	0.013	0.011	0.013	0.022	0.013	0.011	0.285	0.033	0.001	0.001	.29
C	0.156	0.740	0.014	0.012	0.012	0.021	0.014	0.011	0.285	0.030	0.001	0.001	.29

Mechanical Properties (ksi):

YS: 51.0 TS: 66.0 WTS: 69.0 EL: 35% HRB: 78

 * Heat #: 918852 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	0.160	0.720	0.020	0.010	0.010	0.010	0.010	0.000	0.350	0.063	0.000	0.000	.00
C	0.154	0.630	0.027	0.014	0.004	0.010	0.011	0.007	0.274	0.048	0.001	0.001	.26
C	0.157	0.640	0.029	0.014	0.004	0.013	0.011	0.007	0.253	0.045	0.001	0.001	.27

Mechanical Properties (ksi):

YS: 54.0 TS: 71.0 WTS: 73.0 EL: 36% HRB: 81

 * Heat #: 918854 *

Chem Analysis (%):



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 * Heat #: 918854 *

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	- 0.140	0.670	0.017	0.014	0.010	0.010	0.010	0.000	0.280	0.050	0.000	0.000	.00
C	- 0.179	0.740	0.045	0.018	0.016	0.018	0.021	0.011	0.267	0.061	0.001	0.001	.31
C	- 0.178	0.760	0.045	0.017	0.016	0.018	0.022	0.011	0.272	0.063	0.001	0.001	.31

Mechanical Properties (ksi):

YS: 54.1 TS: 61.3 WTS: 57.7 EL: 34% HRB: 79

 * Heat #: 920610 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	- 0.160	0.750	0.014	0.010	0.010	0.010	0.010	0.000	0.350	0.080	0.000	0.000	.00
C	- 0.116	0.770	0.016	0.012	0.014	0.014	0.015	0.011	0.331	0.083	0.001	0.002	.17
C	- 0.134	0.790	0.016	0.011	0.015	0.014	0.016	0.011	0.332	0.086	0.001	0.002	.27

Mechanical Properties (ksi):

YS: 51.8 TS: 67.4 WTS: 71.1 EL: 34%

 * Heat #: 920661 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	- 0.160	0.780	0.025	0.013	0.010	0.010	0.010	0.000	0.280	0.054	0.000	0.000	.00
C	- 0.150	0.620	0.034	0.018	0.004	0.007	0.011	0.007	0.225	0.050	0.001	0.001	.26
C	- 0.151	0.660	0.034	0.017	0.006	0.008	0.011	0.008	0.237	0.053	0.001	0.001	.27

Mechanical Properties (ksi):

YS: 51.0 TS: 66.0 WTS: 68.0 EL: 35% HRB: 76

 * Heat #: 920669 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L	- 0.140	0.720	0.018	0.010	0.010	0.010	0.010	0.000	0.290	0.030	0.000	0.000	.00
C	- 0.139	0.550	0.021	0.019	0.007	0.009	0.018	0.006	0.214	0.034	0.001	0.001	.24
C	- 0.145	0.540	0.020	0.018	0.007	0.009	0.017	0.006	0.213	0.033	0.001	0.001	.24

Mechanical Properties (ksi):

YS: 52.0 TS: 65.2 WTS: 67.6 EL: 33% HRB: 78



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Customer Purchase Order: 7085

 * Heat #: 934448 *

 * Heat #: 934448 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.150	0.780	0.020	0.012	0.010	0.010	0.010	0.000	0.280	0.048	0.000	0.000	.00
C -	0.139	0.810	0.025	0.013	0.008	0.011	0.015	0.010	0.281	0.042	0.001	0.001	.28
C -	0.132	0.770	0.024	0.013	0.007	0.010	0.014	0.010	0.274	0.039	0.001	0.001	.27

Mechanical Properties (ksi):

YS: 52.8 TS: 67.1 WTS: 56.0 EL: 38%

 * Heat #: 934465 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.150	0.740	0.025	0.014	0.010	0.010	0.010	0.000	0.290	0.055	0.000	0.000	.00
C -	0.168	0.710	0.041	0.019	0.014	0.017	0.021	0.010	0.253	0.040	0.001	0.001	.29
C -	0.170	0.720	0.041	0.018	0.015	0.017	0.021	0.010	0.253	0.040	0.001	0.001	.30

Mechanical Properties (ksi):

YS: 51.0 TS: 68.0 WTS: 71.0 EL: 35% HRB: 86

 * Heat #: 934510 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.120	0.750	0.025	0.012	0.010	0.010	0.010	0.000	0.270	0.036	0.000	0.000	.00
C -	0.142	0.590	0.035	0.014	0.004	0.014	0.013	0.007	0.199	0.025	0.001	0.001	.25
C -	0.131	0.600	0.036	0.014	0.005	0.014	0.013	0.007	0.198	0.026	0.001	0.001	.24

Mechanical Properties (ksi):

YS: 53.0 TS: 65.0 WTS: 67.0 EL: 37% HRB: 78

 * Heat #: 934516 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.140	0.800	0.025	0.009	0.010	0.010	0.010	0.000	0.300	0.055	0.000	0.000	
C -	0.126	0.810	0.021	0.009	0.012	0.016	0.014	0.011	0.305	0.065	0.001	0.001	.27
C -	0.130	0.810	0.021	0.009	0.012	0.016	0.014	0.011	0.303	0.065	0.001	0.001	.27

MTR Certificate Continued On Next Page



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Customer Purchase Order: 7085

 * Heat #: 934516 *

Mechanical Properties (ksi):
 YS: 53.7 TS: 67.3 WTS: 69.8 EL: 39% HRB: 83

 * Heat #: 992291 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.150	0.760	0.000	0.007	0.010	0.010	0.010	0.000	0.300	0.035	0.000	0.000	.00
C -	0.158	0.740	0.025	0.009	0.007	0.020	0.014	0.009	0.263	0.024	0.001	0.001	.29
C -	0.165	0.780	0.027	0.009	0.008	0.021	0.015	0.010	0.270	0.028	0.001	0.001	.30

Mechanical Properties (ksi):
 YS: 50.4 TS: 66.9 WTS: 70.1 EL: 36% HRB: 78

 * Heat #: V65466 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.140	0.840	0.016	0.008	0.015	0.028	0.006	0.003	0.020	0.049	0.001	0.001	.29
C -	0.138	0.830	0.012	0.007	0.013	0.032	0.006	0.010	0.018	0.041	0.001	0.001	.29
C -	0.138	0.860	0.013	0.007	0.014	0.033	0.006	0.010	0.019	0.043	0.001	0.002	.29

Mechanical Properties (ksi):
 YS: 53.1 TS: 68.2 WTS: 71.0 EL: 37% HRB: 78

 * Heat #: V65499 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.130	0.820	0.018	0.010	0.016	0.027	0.014	0.001	0.022	0.054	0.001	0.001	.27
C -	0.131	0.790	0.014	0.007	0.014	0.030	0.014	0.010	0.021	0.049	0.001	0.001	.27
C -	0.126	0.780	0.014	0.007	0.013	0.031	0.013	0.010	0.019	0.048	0.001	0.001	.27

Mechanical Properties (ksi):
 YS: 49.6 TS: 64.1 WTS: 65.6 EL: 42% HRB: 79

HYDROSTATIC TEST PRESSURE (psi): 2,350
 1.5" TRANSVERSE STRIP SPECIMEN.

TEXTUBE

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----- C o m m e n t s -----

THIS MATERIAL MEETS ASTM A53-98 GRADE B SPEC.
THIS MATERIAL MEETS ASME SA-53B SPEC.
THIS MATERIAL IS ERW PIPE.
FLATTENING TEST OK.
THIS MATERIAL WAS MANUFACTURED IN THE U.S.A..
THIS MATERIAL IS IN COMPLIANCE WITH NACE STANDARD MR-01-75-94.

MILL TEST REPORTS
FOR PO # 12791
[REDACTED]

The above analyses and tensile properties
are correct to the best of my knowledge
and belief.

James L. [Signature]
Quality Control Dept

Certificate of Tests

5018095

Invoice:

Purchase Order: 7085

Item Number

Description

3B6280L21P

ASTM A53B 6-5/8" X.280"
WALL(18.99#)LAC,21'UF,PE

18.9900 LB

* Heat #:917815 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.150	0.720	0.015	0.010	0.010	0.010	0.010	0.000	0.030	0.058	0.000	0.000	.00
C -	0.184	0.850	0.020	0.017	0.011	0.013	0.014	0.010	0.030	0.068	0.001	0.002	.33
C -	0.158	0.780	0.022	0.011	0.019	0.022	0.031	0.011	0.032	0.061	0.002	0.004	.30

Mechanical Properties (ksi):

YS: 48.30 TS: 64.00 EL: 30% HRB: 73

* Heat #:917816 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.160	0.800	0.015	0.011	0.010	0.010	0.010	0.000	0.030	0.080	0.000	0.000	.00
C -	0.199	0.830	0.025	0.007	0.004	0.015	0.005	0.008	0.022	0.028	0.001	0.001	.34
C -	0.201	0.860	0.026	0.008	0.004	0.015	0.005	0.009	0.023	0.030	0.001	0.001	.3E

Mechanical Properties (ksi):

YS: 55.70 TS: 71.30 EL: 34% HRB: 79

* Heat #:917817 *

Chem Analysis (%):

MTR Certificate Continued On Next Page

* Heat #: 917817 *

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.160	0.800	0.020	0.015	0.010	0.010	0.010	0.000	0.030	0.078	0.000	0.000	.00
C -	0.153	0.810	0.022	0.012	0.042	0.019	0.031	0.015	0.050	0.036	0.001	0.003	.30
C -	0.191	0.810	0.026	0.014	0.019	0.027	0.031	0.013	0.029	0.067	0.001	0.003	.34

Mechanical Properties (ksi):

YS: 54.40 TS: 67.60 EL: 32% HRB: 81

* Heat #: 933468 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.140	0.680	0.014	0.010	0.010	0.010	0.010	0.000	0.040	0.080	0.000	0.000	.00
C -	0.142	0.730	0.019	0.012	0.015	0.012	0.029	0.011	0.035	0.052	0.001	0.003	.27
C -	0.137	0.690	0.018	0.012	0.014	0.011	0.029	0.010	0.033	0.048	0.001	0.002	.26

Mechanical Properties (ksi):

YS: 48.40 TS: 60.80 EL: 34% HRB: 77

* Heat #: 933503 *

Chem Analysis (%):

	C	Mn	P	S	Ni	Cr	Cu	Mo	Si	Al	V	Nb	CE
L -	0.130	0.680	0.014	0.009	0.010	0.010	0.010	0.000	0.030	0.046	0.000	0.000	.00
C -	0.143	0.730	0.021	0.010	0.015	0.020	0.028	0.010	0.028	0.057	0.001	0.002	.27
C -	0.144	0.710	0.015	0.008	0.010	0.019	0.027	0.008	0.027	0.055	0.001	0.001	.27

Mechanical Properties (ksi):

YS: 55.20 TS: 69.00 EL: 34% HRB: 80

Comments

HYDROSTATIC TEST PRESSURE (psi): 2,660
1" STRIP SPECIMEN.
THIS MATERIAL MEETS ASTM A53-98 GRADE B SPEC.
THIS MATERIAL MEETS ASME SA-53-B SPEC.
THIS MATERIAL IS ERW PIPE.
FLATTENING TEST OK.
THIS MATERIAL WAS MANUFACTURED IN THE U.S.A..



Oil Country Tubular Goods
 One Pipe Plant
 P.O. BOX 1670 - NEWPORT, KENTUCKY 41072
 Phone: (606) 222-6655 Fax: (606) 222-0110 oilcog@newportsteel.com

CHEMICAL ANALYSIS AND PHYSICAL TESTS
 LOT NO HEAT TEST
 112801D NC118775 071
 SALES ORDER / RLS
 007138 / 3

Handwritten notes: 10/20/02, 10/20/02, 10/20/02



CUSTOMER P.D. 92	SPECIFICATION API 5L Grade X42	LEVEL PSL 2	E.R.W.		LADING NO 00016356	SHIPMENT DATE 12/19/2001				
PRODUCT J37603M44X42P2 OD: 12.750" Gauge: .375" Spec/Grade: API 5L Grade X42 Type: Line Pipe Length: 44' Coating: Mill Lacquer Beveling: 80 Finish: Plain End WUFc: 48.81 Hydro TP: 2100 psi										
ALTERNATE SPECIFICATIONS API-5L, X42/API-5L, ASTM-A53-BB, ASME-SA53, B GRD.										
Chemical Analysis										
Heat Nbr: NC118775										
	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Al
Ladle	.54	.72	.011	.003	.13	.06	.07	.05	.015	.026
Check	.04	.70	.021	.004	.13	.08	.06	.05	.017	.026
	V	Ca	CE	MAX CE						
Ladle	.001	.029	.002	-						
Check	.001	.026	.002	.000						
Physical Tests										
TEST	TYPE	ORIENTATION	SIZE	UNITS	RESULT					
Tensile	Strip	Transverse	1 1/2"	PSI	69645					
Yield	Strip	Transverse	1 1/2"	PSI	52096					
Elongation in 2"	Strip	Transverse	1 1/2"	Percent	47					
Weld Test				PSI	75725					
TEST	TYPE	ORIENTATION	SIZE	UNITS	RESULT					
Flat					Pass					
TEST	TYPE	ORIENTATION	SIZE	UNITS	RESULT					
Impact	Location 90 Deg.	Transverse	2/3	Ft/Lbs	132					
Impact Temperature	32 F°									
MELTED & MANUFACTURED IN U.S.A.										
End of Certification										
MILL TEST REPORTS FOR PO # 72791 										

This is to certify that the product described is in accordance with the described application and all information included is correct as contained in the records of this company. Prepared by the office of the Manager-Metallurgy & Quality Control - Newport Steel Corporation. This test report cannot be reproduced or distributed except in full without the written permission of Newport Steel Corporation.

D. K. Huggard

JAN 17 '82 13:48

Page 1

Date Printed 01/17/2002
 6592926919 PAGE.004

12456 ps



Oil Country Tubular Goods
 Line Pipe - Piping
 P.O. BOX 1670 - NEWPORT, KENTUCKY 41072
 Phone: (606) 282-8000 Fax: (606) 282-0110 epl00@newportsteel.com

CHEMICAL ANALYSIS AND PHYSICAL TESTS
 LOT NO HEAT TEST
 112901A NC118772 072
 SALES ORDER / RLS
 007138 / 1



CUSTOMER P.O.	SPECIFICATION	LEVEL	LADING NO	SHIPMENT DATE						
82	API 5L Grade X42	PSL 2	E. R. W. 00016366	12/13/2001						
PRODUCT J37503M44X42P2 OD: 12.750" Gauge: .375" Spec/Grade: API 5L Grade X42 Type: Line Pipe Length: 44' Coating: Mill-Lacquar Beveling: 30 Finish: Plain End Wt/Pc: 49.01 Hydro TP: 2100 psi										
ALTERNATE SPECIFICATIONS API-5L X42/API-5L, ASTM-A53-B9, ASME-SA33, B GRD.										
Chemical Analysis										
Heat No.: NC118772										
	C	Mn	P	S	SI	CU	NI	Cr	Mo	Al
Ladle	.04	.74	.012	.007	.12	.05	.03	.04	.012	.036
Check	.04	.72	.013	.007	.12	.06	.03	.04	.012	.027
	V	Ca	Se	CE	Max CE					
Ladle	.001	.031	.002	-	-					
Check	.001	.026	.002	.0063	.25					
Physical Tests										
TEST	TYPE	ORIENTATION	SIZE	UNITS	RESULT					
Tensile	Strip	Transverse	1 1/2"	PSI	71041					
Yield	Strip	Transverse	1 1/2"	PSI	62386					
Elongation in 2" weld Test	Strip	Transverse	1 1/2"	PERCENT	45					
				PSI	72909					
TEST	TYPE	ORIENTATION	SIZE	UNITS	RESULT					
Flux					Pass					
TEST	TYPE	ORIENTATION	SIZE	UNITS	RESULT					
Impact	Location 90 Deg.	Transverse	2/3	FT/Lbc	72					
Impact Temperature	32 F									
MELTED & MANUFACTURED IN U.S.A.										
End of Certification										
MILL TEST REPORTS										
FOR PO # <u>12791</u>										

This is to certify that the product described is in accordance with the described specification and all information included is correct as contained in the records of this company. Prepared by the office of the Manager-Metallurgy & Quality Control - Newport Steel Corporation. This test report cannot be reproduced or distributed except in full without the written permission of Newport Steel Corporation.

D. K. Hegren

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

DATE: 02/15/01
TIME: 12:17:14 USX™

(TYPE B - IN ACCORDANCE WITH ISO 9001/EN10204/ANSI/ASME)

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21519 Pp 5.

MATERIAL CODE: AS-ROLLED			WALL: 0.375 (9.525)			in (mm)										
PRODUCT IDENTIFICATION	TEST TYPE/ ORIENTATION	TENSILE	YIELD		TENSILE	Y/T	ELONG %	HARDNESS		UNI HYDRO	DIELL (SEC)					
			MIN	MAX				PSI	EXT %			HRB	SCALE: HRB			
F20072 R22089	STRIP/T/B STRIP/T/B	AR AR	1.500 1.500	END OF DATA THIS SHEET **	42000 65000	.50 .50	.50 .50	60000 110000	MAX	28.0 32.5 36.5	99.0 *NOTE E *NOTE F	1670 1670 1670	10 10 10			
														END OF DATA THIS SHEET **		
MILL ORDER/ITEM NO. 0M27750 04																
SHIPPER'S NO.																
SOLD TO ADDRESS LONE STAR STEEL CO P O BOX 1000 ATTN ERIC DIEHL LONE STAR TX 75668-0223						MAIL TO ADDRESS LONE STAR STEEL CO P O BOX 1000 ATTN ERIC DIEHL LONE STAR TX 75668-0223						VENDOR USS TUBULAR PRODUCTS 301 FOURTH AVE. MCKEESPORT, PA 15132				
SPECIFICATION AND GRADE PIPE CARBON EM STD PIPE API 5L-X42ND EDITION DATED 1/00 PSL-2 GRADE B/X42 AND ASTM A53-X98 GRADE B TRIPLE STENCIL ASME SA53-X1998 EDITION 2000 ADDENDUM GRADE B CARBON EQUIVALENT ON HEAT ANALYSIS .40 MAX BASED ON C+Mn OVER 5 + (CR+Mo+V) OVER 5 + (C+Mn) OVER 15 BLK REG MILL COAT PE BEY 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD MR-01-75 *2000																
LEGEND: L - LONGITUDINAL U - UPSET V - TRANSVERSE K - NORMALIZED OT - OIL QUENCHED & TEMPERED SR - STRESS RELIEVED AR - AS ROLLED B - BODY W - WELD																
PRODUCT IDENTIFICATION	TYPE	C	S	SI	CU	N	CR	MO	AL	N	V	B	Ti	CB	CO	CE*
F20072	HEAT	:17	008	:197	:01			:04	:005	:031	:004					MAX
F20072	PROO	:17	007	:196	:01			:03	:005	:032	:002					.35
F20072	PROO	:17	009	:196	:01			:03	:005	:031	:002					.35
R22089	HEAT	:17	009	:207	:01			:04	:005	:029	:005					.34
R22089	PROO	:17	009	:201	:01			:04	:005	:032	:002					.35
R22089	PROO	:17	009	:199	:01			:04	:005	:028	:002					.35
**CE IS BASED ON THE FOLLOWING EQUATIONS: C + Mn/5 + (CR+Mo+V)/5 + (C+Mn)/15																

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

DATE: 02/15/01
TIME: 12:17:14 USX™

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(TYPE B - IN ACCORDANCE WITH ISO 9447/EN10204/DIN50048)

21519 R/L

MILL ORDER ITEM NO. DM27750 04	SHIPPER'S NO. 123580	P.O. NUMBER	OD: 16.000 (406.400)		WALL: 0.375 (9.525)	IN (mm)		IN (mm)		IN (mm)		
MATERIAL CODE: AS-ROLLED	FOL NUMBER		16.000 (406.400)		0.375 (9.525)		0.375 (9.525)		0.375 (9.525)		0.375 (9.525)	
PRODUCT IDENTIFICATION	FLAT	BEND	GRAIN SIZE	MIN COLLAPSE	TEST LOC.	TEMP	SIZE	TEST COND.	CHARPY V-NOTCH IMPACT TESTING			IN (mm)
F20072 R22089	OK OK		** END OF DATA	** END OF DATA	T B T B THIS SHEET **	+ 32 + 32 **	2/3 2/3	AR AR	1 19 2 21 3 19	1 17 2 15 3 16	2 20 3 16	AVG
LEGEND:	1 - LONGITUDINAL		T - TRANSVERSE		B - BODY		W - WELD		HAZ - HEAT AFFECTED ZONE			
TESTING / INSPECTION INFORMATION												
TEST / INSPECTION												
FULL LENGTH VISUAL												
FULL LENGTH EMI												
FULL LENGTH MPI												
FULL LENGTH UT												
END AREA INSPECTION (PLAIN END)												
SPECIAL END AREA (SEA) INSP.												
FULL LENGTH DRIFT												
FULL LENGTH UT OF WELD												
RESULTS / COMMENTS												
OD X OD/OD L X L/T 10.0/10.0% NOTCH												
OD OD/OD L L/T												
MPI UT												
MPI UT												
DRIFT MANDREL SIZE												
OD OD/OD X L X L/T 10.0/10.0% NOTCH												
ADDITIONAL NOTES/COMMENTS												
ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT.												
*NOTE E SEE ATTACHED REPORT FOR HARDNESS RESULTS.												
*NOTE F SEE ATTACHED REPORT FOR HARDNESS RESULTS.												
MIN. TEMP. OF WELD SEAM=1700 DEG.F, UT DONE WITH FOUR 1/8" DRILLED HOLES AND P-10 NOTCH. MAGNETISM—OK.												
1/2 SIZE IMPACT REQUIREMENTS: FT/LBS=10 MIN. AVG., 8 MIN. INDIVIDUAL TEST												
2/3 SIZE IMPACT REQUIREMENTS: FT/LBS=13 MIN. AVG., 10 MIN. INDIVIDUAL TEST												
END CUSTOMER P.O. NUMBER: 6966												

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS THE REQUIREMENTS IN SUCH RESPECTS.

PREPARED BY THE OFFICE OF: J. MASSIMINO MGR. MET. & Q.A. USS TUBULAR PRODUCTS

DATE: 02/15/01

MILL TEST REPORTS
FOR PO # 21519



Oil Country Tubular Goods
 Line Pipe Mills
 P O BOX 1870 - NEWPORT, KENTUCKY 41072
 Phone: (859) 232-0000 Fax: (859) 242-0110 es.100@newportsteel.com

CHEMICAL ANALYSIS AND PHYSICAL TESTS

LOT NO HEAT TEST
 712901B KNC118775 071

SALES ORDER / RLS
 007138 / 3



CUSTOMER P.O. 92	SPECIFICATION API 5L Grade X42	LEVEL PSL 2	LADING NO E.R.W. 00016356	SHIPMENT DATE 12/13/2001						
PRODUCT J37503M44X42P2 OD: 12.750" Gauge: .375" Spec/Grade: API 5L Grade X42 Type: Line Pipe Length: 44' Coating: Mill Lacquer Beveling: 30 Finish: Plain End WWT: 49.61 Hydro TP: 2100 psi										
ALTERNATE SPECIFICATIONS API 5L, X42/API 5L, ASTM-A53-99, ASME-SA53, B, GRD.										
Chemical Analysis										
Heat Nbr: NC118775										
	C	Mn	P	S	SI	Cu	Ni	Cr	Mo	Al
Ladle	.04	.72	.011	.003	.13	.06	.07	.05	.019	.026
Check	.04	.70	.011	.004	.13	.08	.06	.05	.017	.026
	V	Cb	Ca	CE	MAX CE					
Ladle	.001	.029	.002	-	-					
Check	.001	.026	.002	.088	.25					
Physical Tests										
TEST	TYPE		ORIENTATION		SIZE	UNITS	RESULT			
Tensile	Strip		Transverse		1 1/2"	PSI	69645			
Yield	Strip		Transverse		1 1/2"	PSI	58096			
Elongation in 2"	Strip		Transverse		1 1/2"	Percent	47			
Weld Test:						PSI	75725			
TEST							RESULT			
Flat							Pass			
TEST	TYPE		ORIENTATION		SIZE	UNITS	RESULT			
Impact	Location		90 Deg.		Transverse 2/3	Ft/Lbs	132			
Impact Temperature	32 F°									
MELTED & MANUFACTURED IN U.S.A.										
End of Certification										
MILL TEST REPORTS FOR PO # 12791										

This is to certify that the product described is in accordance with the described specification and all information included is correct as contained in the records of this company. Prepared by the office of the Manager-Metallurgy & Quality Control - Newport Steel Corporation. This test report cannot be reproduced or distributed except in full without the written permission of Newport Steel Corporation.

D. K. Haggard



Belville Tube Corporation Manufactured For Lone Star Steel
 Hwy 36 and Miller Road
 Bellville, Texas 77418 USA

Mill Test Report

2819 Rev.

06/14/2001 Pg 1 of 1

Customer Order Information

Sales Order: 127720-1

Customer Order (PO): 7087

BOL:



Product

Quantities

Size (O.D.)	Wall	Grade	Type	Length	Pieces
2.375	.154	ASTM A53-B API 5L-B/X42	ERW	CPO	AS INVOICED

Notes and Special Instructions

ALSO MEETS ASME SA53/B & API REQUIREMENTS OF PSL1

Ladle Analysis

MONO#	Lot(s)	Heat(s)	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	CE/API 2H	Ultimate	Yield	%EL
17589	ABC018	980682B	0.21	1.00	0.013	0.003	0.18	0.069	0.021	0.018	0.105	0.003	0.397	79390	60680	51.6
	ABC019	706581	0.20	1.01	0.011	0.004	0.20	0.057	0.034	0.013	0.095	0.004	0.389	79180	61520	51.1

2 Lots

Product Analysis

Heat(s)	Product Analysis #1					Product Analysis #2				
	C	Mn	P	S	Si	C	Mn	P	S	Si
980682B	0.20	1.00	0.014	0.003	0.19	0.20	1.00	0.014	0.003	0.19
706581	0.19	1.01	0.010	0.003	0.22	0.20	1.01	0.013	0.004	0.21

2 Heat(s)

MILL TEST REPORTS
 FOR PO # 12791

Made in the USA

All Material Has Passed API Flattening, Hydro and Drift Tests

Notwithstanding any other provision in this contract, BELLVILLE TUBE makes no warranty as to the suitability of fitness of this product for upgrading by Quench and Temper or any other process, unless BELLVILLE TUBE shall be consulted in advance and give its approval in writing. We hereby certify that the above information is true and correct as contained in the records of this corporation.

Daniel M. Davis

Quality Assurance

06/14/2001

Date

JUN 14 '01 14:49

979 865 9957 PAGE.002



CERTIFICATE OF TESTING

Bill of Lading: 95 - 14955

Certificate Number: 11388-1

Diameter: 6.625 in

Gage: 0.280 in

Grade: A53B

Friday, January 04, 2002, 3:40:53 PM

Specification: ASTM A53-99b/TYPE E
ASME SA-53

Mill Order No: 95-021856-02

Customer PO: 6045

Customer: CIB CORPORATION

Pieces: 100 Length: 21.00 (ft)

Heat	Product ID	Test Type	Orientation					Width (in)			YS (psi)			UTS (psi)			Elong%(2 in)			Y/T
			Wgt (%)	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Sn	Al	V	Cb	Ti	B	CEQ	
213295	YL-336A	315 MILL CONTROL	Heat: 0.20	0.54	0.006	0.005	0.02	0.08	0.10	0.04	0.10	0.015	0.010	0.031	0.000	0.000	0.000	0.000	0.000	0.78
										1.504	56100	71900	35.0							

Melted and Manufactured in the USA
 Flattening Test Acceptable
 Ultrasonic Weld Line Inspection Acceptable
 Hydrostatic Test Pressure: 1780 PSI for 5 secs

TPA - Transverse Pipe Axis
 LPA - Longitudinal Pipe Axis
 TWA - Transverse Weld Axis
 *ST - Full Section Testing
 FBN - Full Body Normalized
 Q&T - Quenched and Tempered
 form CRTR3001

We certify that the product described above has been manufactured, sampled, inspected, and tested in accordance to the referenced specification. The product has been found to be in compliance with all requirements.

ISO 9001 REGISTERED QUALITY SYSTEM
MATERIAL TEST REPORT
 LONE STAR STEEL COMPANY
 P.O. BOX 1000, HWY. 259 S. LONE STAR, TX 75668
 L.S.O: 0101992
 Item: 1
 Weight: 32637
 Lot: 31
 Product: 16" 62.58 X42
 .375" Wall
 PE-BEV RG 3(35'-44' 9") CTD
 API 5L GR X42(OR B), ASTM A53-98 GR B, ASME SA53 GR B.
 BRW. MANUFACTURED IN THE USA.
 Customer Order: 55331300
 Customer Reference:
 Customer Specification:
 Page 1 of 1
 Print Date: 02/23/2000
 Serial #: 300133787

Ship to
 MTR Copies
 Sold To: 1
 Ship To: 0

CHEMICAL ANALYSIS, %

	C	Mn	P	S	Si	Cu	Ni	Cr	Mu	Sn	Al	V	B	Co	Ti	Ca	N	O	CEQ	DI	PCM
Heat	.12	1.12	.010	.003	.22	.03	.01	.002	.003	.001	.048	.000	.0001	.000	.000	.0020	.0044		.310		
Check	.13	1.09	.008	.002	.20	.02	.01	.001	.003	.002	.039	.001	.0001	.002	.002	.0035					
Check	.12	1.08	.008	.002	.20	.02	.01	.001	.003	.002	.037	.001	.0001	.002	.002	.0029					

Heat analysis performed on average section

MECHANICAL PROPERTIES

Test	Dir	Loc	Size	Yield	Tensile	Elong %	Area	Fracture		Y/T		Grain size	RR-1
								Location	Appearance	Ratio	Collapce, PSI		
1	T	B	N	48.5	65.4	45.0	Red	TW		.741			RR-1
2	T	W	N	.0	70.6	.0				.000			RR-2
3													RR-3
4													

Impact Tests

Test	Dir	Loc	Size	Temp	Energy	Shear	Lap	Scale	O.D.	M.W.	I.D.	Yar	Body	Weld	HAZ	Surf
1																
2																
3																
4																

Hardness

Inspections Performed
 VISUAL
 ULTRASONIC WELDLINE

Remarks

Tests are performed in accordance with one or more of the following test methods: E, E4, E10, E18, E45, E93, E118, E240, E21, E28, E40, E45, E108, E109, A255, A257 From the Office of:
D. Z. Hamon, Jr.
 Director of Quality

This is to certify that the product described herein was manufactured, sampled, tested, and/or inspected in accordance with the specifications/orders, and fulfill's the requirements in such respects

TEXAS PIPE & SUPPLY CO., INC.
2330 HOLMES ROAD
HOUSTON TX 77051-1098

TALLY DETAILS

SIZE-WALL-DESCRIPTION

16" X 0.375" PIPE ERW A53/API5L GR B/X-42 PBB SRL

Customer Name: C I B CORPORATION
Purchase Ord#: 05081

Truck No.: AMER MAR.

	Tally/Heat	Tally/Heat	Tally/Heat
01	22.1 32637		
02	21.7 32637		
03	21.9 32637		
04	21.7 32637		
05	21.7 32637		
06	21.5 32637		
07	21.5 32637		
08	21.5 32637		
09	21.9 32637		
10	21.4 32637		
11	21.9 32637		
12	21.9 32637		
13	21.2 32637		
14	20.4 32637		
15	20.6 32637		
16	20.5 32637		
17	21.9 32637		
18			
19			
20			
21			
22			
23			
24			
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27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
	365.3	0.0	0.0

SubTotal Joints : 17 Order#: 218593 Page: 1
SubTotal Footage: 365.3 PPS#: 143860 Date: 06/11/2001
Total Joints : 17
Total Footage : 365.3 Total Request Pages: 2

TEXAS PIPE & SUPPLY CO., INC.
2330 HOLMES ROAD
HOUSTON TX 77051-1098

TALLY DETAILS

SIZE-WALL-DESCRIPTION

36" X 0.375" PIPE ERW A53 GR B PEB SRL

Customer Name: C I B CORPORATION

Purchase Ord#: 5527

Truck No.: AMERICAN M

	Tally/Heat	Tally/Heat	Tally/Heat
01	19.9	811973	
02	20.1	811973	
03	21.0	811973	
04	21.0	811973	
05	20.5	712425	
06	20.2	712425	
07	21.0	712424	
08	21.1	712424	
09	21.0	712423	
10			
11			
12			
13			
14			
15			
16			
17			
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36			
37			
38			
39			
40			
	185.8	0.0	0.0

SubTotal Joints : 9 Order#: 229229 Page: 1
SubTotal Footage: 185.8 PPS#: 150623 Date: 09/28/2001
Total Joints : 9
Total Footage : 185.8 Total Request Pages: 3



SHIPPER'S NUMBER
8101-40580

CERTIFICATE OF TESTS

SALES ORDER NO. 393349 01
PUR. ORD. DATES 10/13/00
BILL OF LADING NUMBER 8101-40660
PURCHASE ORDER NO. BLV-1080

BARTOW STEEL INC
PO BOX 1723
BARTOW FL 32930

BARTOW STEEL INC
ALBERT SIDING
ALBERT FL 32820

I HEREBY CERTIFY THAT THE MATERIAL LISTED HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE RESULTS OF SUCH INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS.
L. J. Deeb
Product/Process Metallurgist

ITEM	ITEM DESCRIPTION / SPECIFICATION	QTY SHIPPED
01	ERW STANDARD PIPE 10.750 OD .355W S&L PE BEV REG MILL COAT Itm-001 P/N: 000649 ASTM A53-99b GRADE B	170 PC 3191.7 FT 145835 LB

HEAT NO.	C	MN	P	S	SI	CU	NI	CR	MO	V	AL	CB	CA	SN	B	CO	N	TI
0942360	.190	106	014	009	.010	.05	.01	.040	.010	.004	.043	.002		.002			.0040	.009
0980440	.190	103	011	010	.010	.02	.01	.040	.010	.003	.047			.002			.0042	.008
0980441	.210	106	017	008	.010	.02	.01	.040	.010	.004	.038			.001			.0049	.003
100307	.170	.96	009	010	.020	.06	.04	.050	.020	.000	.029	.001					.0110	.010

HEAT NO.	LOT NO.	YIELD STY PSI	TENSILE STY PSI	WELD LITS PSI	TENSILE BANDS SE (N)	ELONG % IN 2"	HARDNESS	HYDRO PSI	TESTS
0942360	1	53410	67880	76420	1.50	42.0		1780	5 Sec Hydro Flatten Test OK
0980440	1	51620	67230	74320	1.50	44.0		1780	5 Sec Hydro Flatten Test OK
0980441	1	53460	69680	78650	1.50	46.0		1780	5 Sec Hydro Flatten Test OK
100307	1	53630	78120	84800	1.50	34.0		1780	5 Sec Hydro Flatten Test OK

THESE MILL TEST REPORTS APPLY TO
YOUR PO.# O.C. 5757
BARTOW STEEL REF.# BATSSA



SHIPPING NUMBER
8101-40978

CERTIFICATE OF TESTS

SALES ORDER AREA: 394679 00
BILL OF LADING NUMBER: 8101-40978
PUR. ORD. DATES: 10/20/00
PURCHASE ORDER NO.: BLX-1087

BARTOW STEEL INC
PO BOX 1789
BARTOW FL 33830

BARTOW STEEL INC
ALERT SIDING
ALERT FL 33830

DATE: 12/14/00 FROM: YOUNG'S STEEL

I HEREBY CERTIFY THAT THE MATERIAL LISTED HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE RESULTS OF SUCH INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS.

I. J. Deeb
Product/Process Metallurgist

ITEM	ITEM DESCRIPTION / SPECIFICATION	QTY SHIPPED
01	ERW STANDARD PIPE 10.750 OD .365W DR. PE BEV REG MILL COAT Item-002 P/N: 000503 ASTM A53-99b GRADE B	96 PC 3998.2 FT 151886 LB

HEAT NO.	C	MN	P	S	SI	CU	NI	CR	MO	V	AL	CB	CA	SM	B	CO	N	TI
0951401	.190	107	0.02	0.008	0.10	0.02	0.01	0.50	0.10	0.05	0.44	0.01	0.01	0.01			0.041	0.021
0951415	.190	103	0.10	0.10	0.20	0.03	0.01	0.30	0.10	0.04	0.42	0.02	0.01	0.01			0.042	0.02

HEAT NO.	LOT NO.	YIELD STR (PSI)	TENSILE STR (PSI)	WELD LITS (PSI)	TENSILE SAMPLE (IN)	ELONG % (IN)	HARDNESS (HRC)	HYDRO (PSI)	TESTS
0951401		62940	67970	75350	1.50	39.0		1780	5 Sec Hydro Flatten Test OK
0951415		62510	66950	77170	1.50	42.0		1780	5 Sec Hydro Flatten Test OK

THESE MILL TEST REPORTS APPLY TO
YOUR P.O. # O.C. 5757
BARTOW STEEL REF. # BAT 5519

JAN - 4 2001

MGT 0048 (11/00) T - TRANSVERSE 1 - LONGITUDINAL 1 - TUBE 0 - STRIP
000031 NO. 267 150007 60MAY 4.2001 0.11:41AM T00MET LAB



LONE STAR STEEL COMPANY

P.O. BOX 1090, HWY. 259 S. LONE STAR, TX 75668

Results relate only to items tested. Test report not to be reproduced except in full without written approval of the General Manager, Quality.

ISO 9001 REGISTERED QUALITY SYSTEM

WWW.GENERALSTEEL.COM

Page 1 of 1

Print Date: 5/1/2002

Serial #: 2001.42913

LSO: 0125617

Heat: 4

Heat: 65897

Lot: 71

Product

12 3/4" 98.61 ASBEE

.375" Web

PEBEX RG 3(C1' +/- F) CID

ASTM A53-99B GRADE B ERW.

MANUFACTURED IN THE USA

Specifications

Ship to: [Blank]

Ship to: [Blank]

MIR Copies

Sold to: 1

Ship to: 0

CHEMICAL ANALYSIS, %

	C	Mn	P	S	Si	Cu	Ni	Cr	Mo	Sn	Al	V	B	Ca	N	O	CEQ	DK	PKM
Heat	0.24	0.76	0.006	0.007	0.03	0.06	0.02	0.101	0.04	0.002	0.024	0.002	0.0002	0.002	0.0009	0.0102			
Check	0.25	0.78	0.006	0.013	0.1	0.06	0.02	0.101	0.04	0.003	0.028	0.002	0.0001	0.002	0.0014				
Check	0.25	0.79	0.005	0.007	0.1	0.06	0.02	0.101	0.04	0.003	0.026	0.002	0.0001	0.002	0.0012				
Check																			

Heat analysis performed at separate facility.

MECHANICAL PROPERTIES

Test	Dir	Loc	Notch	Yield KSI	Tensile KSI	Elong % in 2"	Area Red	Fracture Location	Y/T Ratio	Grain size	Martensite %	Colapse, PSI	Hydrotest, PSI	Flattening
1	T	B	N	59	79	32	0	OW	0.746				1240	P
2	T	W	N	0	79.5	0	0		0					
3														
4														

Impact Tests

Test	Dir	Loc	Size	Temp	Energy	%Shear	Lat Exp	Scale	O.D.	PAW	I.O.	Var	Body	Weld	HAZ	Surf
1																
2																
3																
4																

Inspections Performed

Inspections Performed
VISUAL ULTRASONIC WELDLINE

Remarks


D. J. Hanson, Jr.

General of Quality

This is not a certified document. It is intended for use as a reference only. It does not constitute a contract. The user of this document is responsible for its proper use and interpretation.



J-08 Manufacturers Certificate of Compliance - Valves


General Valve
800 Koomey Road
Brookshire, Texas 77423

GENERAL VALVE

Certificate

Of Compliance

Customer: ENGINEERED VALVE SPECIALTIES

Date: DECEMBER 12, 2002

Customer P.O. Number: 220658

Subject Article : (2) 12" ANSI 150 FIG. A1911

Serial Number: 50939-1-1/-2

It is hereby certified that all articles, materials, processes and finished parts used, are in conformance with pertinent specifications and quality requirements shown in the purchase order. We further certify that all fasteners meet customers P.O. requirements.

Chuck Baughman
Quality Assurance Department

GENERAL VALVE COMPANY
TWIN SEAL & OHC VALVE
INSPECTION & TEST REPORT CERTIFICATION

SALES ORDER NO.: 50939 CUSTOMER: ENGINEERED VALVES SPEC

CUSTOMER P.O. NO.: 220658

FIGURE NO. A19116 SIZE 12" SERIES 150 TRIM VFTOM

INSPECTION

1. INSPECT AND RECORD BODY, BONNET & LOWER PLATE & HUB HEAT NUMBERS AS REQUIRED
2. CHECK FINISH ON FLANGES
3. CHECK VALVE TO SEE IF PROPERLY DEBURRED
4. CHECK LINE-UP OF PORTS
5. CHECK MARKINGS ON VALVE
6. CHECK FLOW DIRECTION ON ALL RELIEF ASSEMBLIES
7. OPERATE MECHANISM & FUNCTIONALLY TEST ALL ACCESSORIES
8. IF SO SUPPLIED, CHECK ELECTRIC ACTUATOR TORQUE AND LIMIT SWITCHES WITH OHM METER FOR PROPER OPERATION
9. IF SO SUPPLIED, RUN MOTOR OPERATED VALVE AND SET TORQUE AND LIMIT SWITCHES. (LIST SERIAL NO. OF MOTOR OPERATED VALVE ON BACK OF THIS CERTIFICATION.)
10. CHECK TO SEE THAT THE ASSEMBLY IS CONSISTENT WITH SALES ORDER REQUIREMENTS.
11. IF API MONOGRAM IS REQUIRED ACKNOWLEDGE APPLICATION

PRESSURE TESTS TO:

API 598 _____ API 6D
API 600 _____ OTHER _____

HYDROSTATIC SHELL TEST

PSI 450 DURATION 15 _____

HIGH PRESSURE SEAT TEST

PSI 300 DURATION 5 _____

LOW PRESSURE SEAT TEST

MEDIA (AIR) (WATER)

PSI _____ DURATION _____

SIZE	<u>12</u>	MODEL	<u>A1911</u> DBB
API CLASS	<u>150</u>	604 F/F	
100°F MOP	<u>275</u>	NOT F	<u>350</u>
BODY	<u>A216WB</u>	SEAT	<u>VFTOM</u>
MFG DATE	<u>8-02</u>		
SERIAL NO	<u>50939-1-1</u>		

GENERAL VALVE - BROOKSHIRE, TEXAS 92-445

SHOW API MONOGRAM IF REQUIRED

TAG TO BE MARKED PER GVMPS 11260 IN ACCORDANCE WITH S.O.

NOTE: LONGBEACH, CA; TAG #92-510
LISC NO. 60-0075.1

SERIAL NO.'S 50939-1-1-2

R. Navick 8-28-02
ASSEMBLER DATE

Chris Buehler
QUALITY ASSURANCE DATE 8/28/02

DATE

DATE

PROPRIETARY DATA - This document contains confidential, privileged trade secrets which are the property of General Valve Company. This document and the data contained herein are provided for evaluation information purposes only and shall not be duplicated, used or disclosed in whole or in part outside the recipient organization without the express written consent of the General Valve Company.


LTR	DATE	REVISION	BY	PREPARED BY	DATE	GENERAL VALVE CO.
K	11/18/96	C.O. 10226	DS/GMS	DS	1/91	
L	2/10/99	C.O. 10465	DS/GMS	GMS	1/91	
M	07/13/00	C.O. 10655	MHV	BOOK: 3 SECTION: DESIGN WORKSHEETS		
GENERAL VALVE COMPANY TWIN SEAL & OHC VALVE INSPECTION & TEST REPORT CERTIFICATION						

SALES ORDER: 50939

DATE: 8-28-02

ITEM NO.	BODY	BONNET	HEAT NUMBER		UPPER BEARING RETAINER	LOWER BEARING RETAINER	CURE DATE	MOTOR SERIAL # / SECONDS
			LOWER PLATE	IJUB				
1-1	00112	01Y11793	567541	8976404			3-02	
2	02165	01Y11793	567541	8976404			3-02	

REVISION M

 GENERAL VALVE CO.

TITLE
GENERAL VALVE COMPANY
TWIN SEAL & OHC VALVE
INSPECTION & TEST REPORT CERTIFICATION

GVMPDS
12103
SHT 2 OF 2

PROHIBITARY DATA - This document contains confidential proprietary data owned, held or the property of General Valve Company. This document and the data contained herein are provided to you under the understanding that you will not be divulged, used or distributed in whole or in part outside the recipient organization without the express written consent of the General Valve Company.



**Atchison
Casting**

CERTIFICATE OF COMPLIANCE

CUSTOMER: FLOW PRODUCTS, INC.
PURCHASE ORDER: 500712
PART DESCRIPTION: 12" 150# FIG. A1911 TWIN SEAL FLG'D BODY
SPECIFICATION/S: ASTM A216 GRADE WCB
PART NUMBER: 1-524-R
SERIAL/HEAT NUMBER: 02 164 THRU 02 169 - 2020433
QUANTITY: 6 PIECE(S)

THE SELLER WARRANTS THAT ALL ITEMS FURNISHED ON THE PURCHASE ORDER ARE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP PURSUANT TO SELLERS' WARRANTY. THE SELLER SHALL FURNISH CERTIFICATION RESULTS OF THE TESTS COMPLETED AS REQUIRED.

Angie Beagle
TECHNICAL SERVICES DEPARTMENT

7/26/02
DATE

ATCHISON/ST. JOE DIVISION
ATCHISON CASTING CORPORATION
400 SOUTH FOURTH STREET•P.O. BOX 188•ATCHISON, KANSAS 66002-0188•(913) 367-2121•FAX (913) 367-3482



**ATCHISON STEEL
CASTING & MACHINING**

400 SOUTH FOURTH STREET P.O. BOX 188 ATCHISON, KANSAS 66002-0188

CERTIFIED MATERIAL TEST REPORT

FLOW TECHNOLOGIES

800 KOOMEY RD.
BROOKSHIRE TX 77423

ORDER 500712 07/12/02

SPEC ASTM A-216 WCB REV
PART 1-524-R
MATERIAL ASTM A216 GR WCB
HEAT 2020433
SERIAL 02/164 THRU 02/169

**** CHEMICAL PROPERTIES ****

C	.2000
MN	.5700
P	.0100
S	.0110
SI	.2800
CR	.1200
NI	.0900
MO	.0700
CU	.1200

*** MECHANICAL PROPERTIES ***

TS	80051
YIELD	54960
%EL	27.5
%RA	49.5

12" 150# FIG. A1911 TWIN SEAL FLG'D BODY

CE .3500

CERTIFIED BY: *Robert L. Huggen*

Process Metallurgist

DATE: 7/26/2002



**Atchison
Casting**

CERTIFICATE OF COMPLIANCE

CUSTOMER: FLOW PRODUCTS, INC.

PURCHASE ORDER: G124279

PART DESCRIPTION: 12" 150# FIG. A1911 TWIN SEAL FLG'D BODY

SPECIFICATION/S: ASTM A216 GRADE WCB

PART NUMBER: 1-524-R

SERIAL/HEAT NUMBER: 00/112 THRU 00/117 - 2000578

QUANTITY: 6 PIECE(S)

DEVIATION/WAIVER:

SHIPPER NUMBER: 00022618

THE SELLER WARRANTS THAT ALL ITEMS FURNISHED ON THE PURCHASE ORDER ARE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP PURSUANT TO SELLERS' WARRANTY. THE SELLER SHALL FURNISH CERTIFICATION RESULTS OF THE TESTS COMPLETED AS REQUIRED.

Mike Drinkard
TECHNICAL SERVICES DEPARTMENT

8-25-00
DATE



**ATCHISON
CASTING**

400 South Fourth Street P.O. Box 188 Atchison, Kansas 66002-0188

P. 1

Atchison/St. Joe Division

CERTIFIED MATERIAL TEST REPORT

FLOW TECHNOLOGIES

800 KOOMEY RD.
BROOKSHIRE TX 77423

ORDER G124279 08/16/00

SPEC ASTM A-216 WCB REV
PART 1-524-R

MATERIAL ASTM A216 GR WCB
HEAT 2000578

SERIAL 00/112 THRU 00/117

**** CHEMICAL PROPERTIES ****

C	-2000
MN	.5700
P	.0070
S	.0100
SI	.3700
CR	.1400
NI	.0800
MO	.0800
CU	.1400

**** MECHANICAL PROPERTIES ****

TS	81500
YIELD	57000
%EL	29.0
%RA	70.0

12" 150# FIG. A1911 TWIN SEAL FLG'D BODY

CE .3500

CERTIFIED BY:

DATE: 8/23/2000

FORM 57-G-092 RVA 05/19/1999



WE HEREBY CERTIFY THAT THE ABOVE MATERIAL HAS BEEN TESTED IN ACCORDANCE WITH THE LISTED SPECIFICATIONS AND CONFORMS TO ALL APPLICABLE REQUIREMENTS THEREOF.

FOX METALS & ALLOYS, INC.
12660 FM 529
HOUSTON, TX 77041

MILL TEST CERTIFICATE
HEAT # 01Y11793
PART # 2-694-R

ORDER NO. : M22019408
LC NO. : H306510286

COMMODITY : PLATE

CUSTOMER

CERTIFICATE NO.

: C-2001-2-00133-12

SPECIFICATION : ASTM A30-90 ASME SA30-90

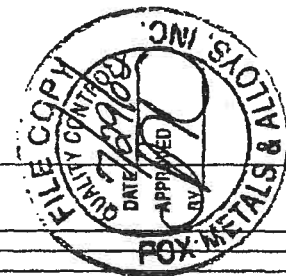
SUPPLIER

DOMINIC INTERNATIONAL, INC. (U.S.)

DATE OF ISSUE

: JUL. 05. 2001

DIMENSIONS (mm)	HEAT NO	PRODUCT No	QUAN- TITY	WEIGHT (kgs)	CHEMICAL COMPOSITION (%)											MECHANICAL ANALYSIS				REMARKS												
					C	Si	Mn	P	S	SAI	Cr	Ni	Mo	Cu	Nb	V	Ti	CEQ	TENSILE TEST		IMPACT TEST											
					T	C	Si	Mn	P	S	SAI	Cr	Ni	Mo	Cu	Nb	V	Ti	CEQ	Y	TS	EL	Y	TS	EL	Y	TS	EL	Y	TS	EL	
**SPELLEN NO : 400329 4-1/2" x 90" x 108" 114.00 x 2.438 x 4.267 **SPELLEN NO : 403316	01Y11735	SUB TOTAL 13: 403316-1	(10)	116.500	17	26	108	15	5	33	1	1	0	1	0	4	1	35	279	485	31											
4-1/2" x 90" x 108" 114.00 x 2.438 x 4.267 **SPELLEN NO : 403316	01Y11731	403316-1		9.435	15	21	111	17	3	28	1	1	0	1	0	3	2	35	293	497	31											
4-1/2" x 90" x 108" 114.00 x 2.438 x 4.267 **SPELLEN NO : 403316	01Y11731	403315-1		9.336	16	23	108	21	6	24	1	1	0	1	0	5	1	34	278	483	35											
4-1/2" x 90" x 108" 114.00 x 2.438 x 4.267 **SPELLEN NO : 403317	01Y11738	403317-1		9.336	18	26	118	20	5	32	2	1	0	1	4	2	38		258	456	32											
4-1/2" x 90" x 108" 114.00 x 2.438 x 4.267 **SPELLEN NO : 403316	01Y11783	403316-1		9.336	16	26	113	20	5	28	2	2	0	1	0	4	1	36		270	491	34										
4-1/2" x 90" x 108" 114.00 x 2.438 x 4.267 **SPELLEN NO : 403320	01Y11800	403320-1		9.336	17	26	113	17	7	26	1	1	0	1	0	2	2	36		271	492	34										
4-1/2" x 90" x 108" 114.00 x 2.438 x 4.267 **SPELLEN NO : 403322	01Y11731	403313-1 403314-1 403315-1 SUB TOTAL 14:	(12)	112.000	16	23	108	21	6	24	1	1	0	1	0	5	1	34		275	498	33										
**SPELLEN NO : 403322 5" x 90" x 108" 127.00 x 2.438 x 4.267 **SPELLEN NO : 403327	01Y11660	403327-1		10.373	17	26	109	18	6	30	1	1	0	1	0	4	1	36		285	466	35										
5" x 90" x 108" 127.00 x 2.438 x 4.267 **SPELLEN NO : 403329	01Y11578	403324-1 403325-1 403331-1		10.373	17	25	104	20	5	40	1	1	0	1	0	5	1	35		275	472	38										



- CEC-CARBON EQUIVALENT
- POSITION : (TOP, MIDDLE, BOTTOM)
- DIRECTION : (LONGITUDINALLY, CROSS WISE)
- HEAT TREATMENT : BLANK IS AS-ROLLED
- NORMALIZED QUENCHED CR-CONTROL ROLLED
- THERMO MECHANICAL
- ULTRASONIC : (GOOD)
- DIVISION : (CHECK ANALYSIS LADLE ANALYSIS)
- SUB SIZE : (REAL VALUE 17 x 10 = 23.9 x 10mm)
- GUAGE LENGTH : (1) 100mm (2) 150mm (3) 200mm (4) 250mm (5) 300mm (6) 350mm (7) 400mm (8) 450mm (9) 500mm

WE CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN ACCORDANCE WITH ABOVE SPECIFICATION AND ALSO WITH THE REQUIREMENTS CALLED FOR BY THE ABOVE ORDER.

[Signature]

LINE # 10 SEE BACK SIDE



Jindal United Steel Corporation
5200 E. McKinney Road
Baytown, TX 77520

File Number: 05532

MATERIAL CERTIFICATION

MILL ORDER: 2200204-19
P.O. NUMBER: 1601655-AIM 1/2 ASTM
SIZE: 2.5 X 96 X 240

P.O. DATE: 2/14/02
REF BR11470

PAGE NUMBER: 1 of 1
PRINTED: 3/22/02 at 14:10

QUANTITY ON BULLETIN: 2
WEIGHT ON BULLETIN : 32670

S
O T
L O
D

FOX METALS & ALLOYS, INC.
12660 FM 529
HOUSTON, TX 77041

Material Description: HOT ROLLED PLATE CUT EDGE ASTM/ASME A36-97a/SA 36-98 EDITION STRUCTURAL QUALITY

This is to certify that the product described herein was manufactured, sampled and tested in accordance with the specifications and requirements in such specifications

Plates Manufactured in the USA

Heat Number	C	0.18	MN	1.04	P	0.018	S	0.009	SI	0.25
5G7541	CU	0.03	NI	0.03	CR	0.03	MO	0.010	SN	0
	AL	0.030	N	0.006	V	0.005	B	0.0010	TI	0
	ZR		CB	0.010	AS	0.01	CA	0		

Thickness	0.2%YIELD/PSI	TENSILE UTS/PSI	% Elong
2.5000	41892.0	69651.0	32.00

MILL TEST REPORTS
SUPPLIED BY
FOX METALS & ALLOYS, INC.
DATE 07-20-02
CUSTOMER FLOW PRODUCTS
P.O. NO. 500865
F.M. NO. 291609
DESC 2 PLT CUT 2 1/2" X 23 7/8" DSA
(1.18" - .000")
TAG: PIV 3-680-R

4/2/02

FOX METALS
HEAT # 5G 75 41
PART # 3-680-R

APPROVED BY MJ 3/12 Date

MET-04

LINE#8

CERTIFICATE OF TEST



Certification Date
8-JUL-2002

CUSTOMER ORDER NUMBER

500543

5311 CLINTON DRIVE
HOUSTON TX 770207911

Invoice Number
S529381

CUSTOMER PART NUMBER

14-500

Ship# T495287

SOLD TO: FLOW PRODUCTS INC
800 KOOMEY ROAD
BROOKSHIRE TX 77423

SHIP TO: FLOW PRODUCTS INC
800 KOOMEY ROAD
BROOKSHIRE TX 77423

Description: 1018 HR ASTM A576
5 RD X 20'R/L
HEAT: 8976404

ITEM: RDBS

Line Total: 4 BARS

Specifications:
ASTM A576 90B

CHEMICAL ANALYSIS

C	MN	P	S	SI	CU	NI	CR
0.18	0.83	0.013	0.022	0.23	0.17	0.13	0.17
MO	AL	V	N	CB	SN		
0.03	0.03	0.001	0.0048	0.002	0.009		

RCPT: S529381
MILL : REPUBLIC TECH./ TEJAS TESTING COUNTRY OF ORIGIN : USA

MECHANICAL PROPERTIES

DESCRIPTION	YLD STR PSI	ULT TEN PSI	%ELONG IN 02 IN	%RED IN AREA	HARDNESS BHN
	40000.0	70000.0	35.0	65.0	137

GRAIN SIZE : 7 -

STRAND CAST REDUCTION RATIO 6.6 TO 1
MATERIAL IS FREE FROM MERCURY CONTAMINATION
NO WELD REPAIR PERFORMED ON MATERIAL

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

BOB DONALDSON

Robert A. Donaldson Jr
MANAGER, QUALITY ASSURANCE

CERTIFICATE OF TEST



Page 02 of 02

Certification Date
8-JUL-2002

CUSTOMER ORDER NUMBER

500543

5311 CLINTON DRIVE
HOUSTON TX 770207911

Invoice Number
S529381

CUSTOMER PART NUMBER

14-500

Ship# T495287

SOLD TO: FLOW PRODUCTS INC
800 KOOMEY ROAD
BROOKSHIRE TX 77423

SHIP TO: FLOW PRODUCTS INC
800 KOOMEY ROAD
BROOKSHIRE TX 77423

Description: 1018 HR ASTM A576
5 RD X 20'R/L
HEAT: 8976404

ITEM: RDBS

Line Total: 4 BARS

COMMENTS

MELT SOURCE REPUBLICA CANTON
HOT ROLL SOURCE REPUBLIC MASSILLON
TEJAS LOT# T008517

The above data were transcribed from the manufacturer's Certificate of Test after verification for completeness and specification requirements of the information on the certificate. All test results remain on file subject to examination.

We hereby certify that the material covered by this report will meet the applicable requirements described herein, including any specification forming a part of the description.

The willful recording of false, fictitious, or fraudulent statements in connection with test results may be punishable as a felony under federal statutes.

Material did not come in contact with mercury while in our possession.

BOB DONALDSON

Robert A. Donaldson Jr
MANAGER, QUALITY ASSURANCE



1. GENERAL. THESE TERMS AND CONDITIONS OF SALE APPLY TO ALL QUOTATIONS AND OFFERS MADE BY AND PURCHASE ORDERS ACCEPTED BY COMPANY. TO THE EXTENT THAT THESE TERMS AND CONDITIONS CONFLICT WITH OR ARE DIFFERENT FROM THOSE CONTAINED IN ANY BUYER PURCHASE ORDER OR OTHER PROCUREMENT DOCUMENTS, THESE TERMS AND CONDITIONS WILL CONTROL. COMPANY SPECIFICALLY REJECTS ANY CONFLICTING BUYER TERMS. BUYER'S ACCEPTANCE OR PAYMENT FOR THE GOODS SHALL CONCLUSIVELY CONFIRM AGREEMENT TO THESE TERMS.
2. Quotations/Purchase Orders. All quotations expire after thirty (30) days and are subject to withdrawal at any time prior to acceptance. Quotations are solicitations for an order; all orders are subject to acceptance by Company.
3. Prices/Terms. All prices are FOB shipping point (EX-WORKS on foreign shipments). Company will follow Buyer's reasonable instructions with respect to method of shipment and carrier. Absent such instructions, Company will ship by commercially reasonable means, freight prepaid, for Buyer's account. Subject to credit approval, terms on domestic sales are net fifteen (15) days. Amounts not paid when due will bear a late payment charge of one and one-half percent (1½%) per month or the maximum legal rate, whichever is less.
4. Delivery. Delivery dates are estimates only. Company will make commercially reasonable efforts to meet delivery dates but will not otherwise be responsible for delays in delivery. Title and risk of loss passes to the buyer upon transfer of the goods to the carrier at the shipping point. Receipt of the goods by the buyer shall constitute a waiver of all claim for delay.
5. Force Majeure. Company shall not be liable for, nor be deemed in default by reason of, any failure or delay in performance where such delay or failure is caused in whole or in part by any act of God or the public enemy, law, regulations, or order of any government agency, riot, strike, or civil commotion, embargo, damage or delay in transportation, inability to obtain necessary labor or materials from usual sources, or other causes beyond the reasonable control of Company. In the case of delay due to any such cause, the date of delivery will be adjusted to reflect the actual length of time lost by reasonable delay.
6. Cancellations and Deferred Deliveries. Orders placed cannot be cancelled, nor can deferred deliveries of goods made up or in process be extended beyond the original delivery date specified, except with Company's written consent. Goods held for Buyer are held at Buyer's expense and risk, and shall be subject to charges for storage and handling.
7. Taxes. All prices are exclusive of any present or future sales, revenue, use, or excise tax, duties or similar charges, all of which shall be paid by Buyer, and may be added to the purchase price unless Buyer provides to Company appropriate certification of exemption.
8. Acceptance. Buyer shall accept or reject goods upon receipt. Failure to notify Company immediately in writing of nonconforming goods shall be deemed an unqualified acceptance. Any use of goods by Buyer which are not related to acceptance testing shall constitute acceptance.
9. Security. If Buyer fails to fulfill the terms of payment on any order, the Company may defer all further shipments to Buyer until such payments are made, or may, at its option, cancel outstanding orders. The Company reserves the right, even after partial shipment, to require from Buyer satisfactory security for payment and Company may suspend shipments until such security is furnished, and, at its option, may cancel the order.
10. Enforcement. Forbearance or failure of the Company to enforce any of these terms and conditions or to exercise any right accruing from any default of the Buyer shall not affect or impair Company's rights in case such default continues, or in case of any subsequent default, and such forbearance or failure will not act as a waiver with respect to any other or future defaults of Buyer.
11. Warranty. Company warrants only the original Buyer and first user that goods of its own manufacturer will conform to Company's specifications, drawings and other specifications agreed to in writing to be applicable, and that the goods will be free from material defects and goods and workmanship. The duration of the warranty is eighteen (18) months after shipment, or twelve (12) months after being at first placed in operation, whichever is earliest. Seller will repair or replace, at its option, any goods found to be defective or nonconforming, provided that: (a) Buyer gives prompt written notice of the defect or nonconformity within the warranty; (b) at Company's request Buyer has returned the nonconforming goods

to Company freight prepaid; (c) Company has determined in its sole discretion that Buyer has not improperly handled or shipped the goods, or subjected them to misuse, misapplication, accident, alteration, neglect, improper or inadequate maintenance, installation, or repair, or had the goods repaired or altered by anyone other than Company or its authorized service representatives. Company shall have the sole right to determine whether returned goods or parts shall be repaired or replaced, or whether the Buyer shall be credited for the value of the original purchase price. Company's liability shall be limited to the original purchase price of the subject goods or parts. This is Company's sole warranty with respect to the goods delivered hereunder: no statement, representation, agreement, or understanding, oral or written, made by any agent, distributor, representative, or employee of Company which is not contained within this warranty will be binding upon Company unless in writing and executed by an officer of the Company. COMPANY MAKES NO OTHER WARRANTY OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, AND SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Seller makes no warranty with respect to goods custom made to Buyer's specifications, and Buyer agrees to hold Seller harmless from claims based upon compliance with such specifications. Repaired or replacement goods will be delivered to Buyer FOB point of shipment. The warranty period for goods repaired or replaced under this warranty will be for the remainder of the warranty period under its original sale, except the time required to make the repair/replacement will be added to the original warranty period. If within a reasonable time Company is unable to provide repair or replacement goods conforming to the Agreement, Company will refund the full purchase price. Company warrants actuators, electrical apparatus, auxiliary fittings and other parts or materials not manufactured by Company to the same extent that a warranty is made by the manufacturer of such equipment and material.

12. Limitation of Liability. IN NO EVENT WILL SELLER BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES OF ANY KIND SUSTAINED FROM ANY CAUSE OR ARISING OUT OF ANY LEGAL THEORY, WHETHER CONTRACT, NEGLIGENCE, STRICT TORT LIABILITY, OR OTHERWISE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER IN AN AMOUNT EXCEEDING THE PURCHASE PRICE OF THE SUBJECT PRODUCT. THESE LIMITATIONS INCLUDE ANY LIABILITY THAT MAY ARISE OUT OF THIRD-PARTY CLAIMS. ANY LAWSUIT BY BUYER AGAINST SELLER SHALL BE FILED WITHIN EIGHTEEN MONTHS FROM DELIVERY OF THE SUBJECT PRODUCT BY SELLER. THESE LIMITATIONS SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OR OF ANY LIMITED REMEDY PROVIDED HEREIN.

13. Patent. Company will defend any lawsuit against Buyer claiming that goods sold by Company to Buyer infringe any United States patent, and Company will pay any judgment rendered against Buyer on such claim, provided Buyer gives Company prompt notification of such claim or lawsuit and Company is given authority, information and assistance for defense of same; and the Company shall, at its option, procure for the Buyer the right to continue to use the goods, modify them so that they become noninfringing, replace them with noninfringing goods, or to refund the purchase price. Company shall not be obligated to defend or be liable for costs or damages if infringement arises out of compliance with Buyer's specifications, addition to or combination with other goods, modification of the goods after delivery to Buyer, or use of the goods or any part thereof in the practice of the process. The foregoing states the entire liability of Company with regard to patent infringement.

14. Disputes. The rights and liabilities of the parties arising out of or relating to this agreement will be governed by the laws of the state of Texas; venue in any lawsuit between the parties will lie exclusively in state or federal courts in Texas; and the prevailing party in such litigation will be entitled to recover all reasonable attorneys' fees and other expenses (in addition to statutory "costs" of litigation) including attorneys' fees and expenses in connection with any trial, appeal, or petition for review. Company excludes application of the U.N. Convention on International Sale of Goods.

15. ENTIRE AGREEMENT. THE PROVISIONS CONTAINED HEREIN CONSTITUTE THE ENTIRE AGREEMENT BETWEEN THE PARTIES AND SUPERSEDE ALL PREVIOUS COMMUNICATIONS AND REPRESENTATIONS, EITHER VERBAL OR WRITTEN, BETWEEN THE PARTIES WITH RESPECT TO THIS SUBJECT MATTER HEREOF. THIS AGREEMENT MAY NOT BE CHANGED, ALTERED, SUPPLEMENTED OR ADDED TO AT ANY TIME EXCEPT BY WRITTEN AGREEMENT SIGNED BY THE PARTIES.

Transmittal Letter

TO: Worley International
13105 Northwest Frwy, Suite 200
Houston, Tx. 77040

ATTN: Dale England

DATE: March 28, 2002

FROM: Rhonda Hobbs

REFERENCE: E.V.S.I. File #P211246

SUBJECT: Documentation for General Twin Seal Valves

RE: Purchase Order #2966

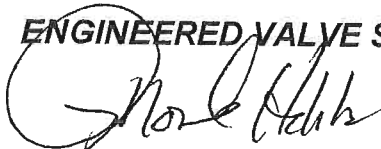
Per the above referenced purchase order, please find the following documentation.

***Operation, Maintenance & Service Manual
Certificate of Compliance
Mill Test Report
Hydrostatic Test Report***

Please do not hesitate to call me if you have any questions, or require additional information.

Sincerely,

ENGINEERED VALVE SPECIALTIES, INC.



Rhonda Hobbs
Customer Service Representative



General Valve Company

800 Koomey Road
Brookshire, Texas 77423-8803
A PCC Flow Technologies Company

GENERAL VALVE

Certificate Of Compliance

Customer: **ENGINEERED VALVES SPECIALTIES**

Date: **MARCH 27, 2002**

Customer P.O. Number: **211246**

Subject Article: **(14) 4" ANSI 150 FIG. C811-H**
GENERAL TWIN SEAL VALVE

Serial Number: **01GA0905-1-1/-14**

It is hereby certified that all articles, materials, processes and finished parts used, are in conformance with pertinent specifications and quality requirements shown in the purchase order including API 6D. We further certify that all fasteners meet customers P.O. requirements.

Gina Allen
Quality Department

GENERAL VALVE COMPANY
TWIN SEAL & OHC VALVE
INSPECTION & TEST REPORT CERTIFICATION

SALES ORDER NO.: 01GA0905 CUSTOMER: ENGINEERED-VALVES-SPECIALTIES
 CUSTOMER P.O. NO.: 211246
 FIGURE NO. CR11 SIZE 4 SERIES 150 TRIM VITON

INSPECTION	PRESSURE TESTS TO:
1. INSPECT AND RECORD BODY, BONNET & LOWER PLATE & HUB HEAT NUMBERS AS REQUIRED	API 598 _____ API 60 <input checked="" type="checkbox"/>
2. CHECK FINISH ON FLANGES	API 600 _____ OTHER _____
3. CHECK VALVE TO SEE IF PROPERLY DEBURRED	HYDROSTATIC SHELL TEST
4. CHECK LINE-UP OF PORTS	PSI <u>450</u> DURATION <u>5 MIN</u>
5. CHECK MARKINGS ON VALVE	HIGH PRESSURE SEAT TEST
6. CHECK FLOW DIRECTION ON ALL RELIEF ASSEMBLIES	PSI <u>300</u> DURATION <u>5 MIN</u>
7. OPERATE MECHANISM & FUNCTIONALLY TEST ALL ACCESSORIES	LOW PRESSURE SEAT TEST
8. IF SO SUPPLIED, CHECK ELECTRIC ACTUATOR TORQUE AND LIMIT SWITCHES WITH OHM METER FOR PROPER OPERATION	MEDIA (AIR) (WATER)
9. IF SO SUPPLIED, RUN MOTOR OPERATED VALVE AND SET TORQUE AND LIMIT SWITCHES. (LIST SERIAL NO. OF MOTOR OPERATED VALVE ON BACK OF THIS CERTIFICATION.)	PSI _____ DURATION _____
10. CHECK TO SEE THAT THE ASSEMBLY IS CONSISTENT WITH SALES ORDER REQUIREMENTS.	
11. IF API MONOGRAM IS REQUIRED ACKNOWLEDGE APPLICATION	

SIZE	<u>4</u>	MODEL	<u>CR11</u>	<u>DBB</u>
API CLASS	<u>150</u>	504 F/F		
LOG F NOP	<u>275</u>	NOT F	<u>350</u>	LISC NO. 60-0075
BODY	<u>A216 WCB</u>	SEAT	<u>VITON</u>	
MFG DATE	<u>1-02</u>			
SERIAL NO.	<u>01GA0905</u>			

GENERAL VALVE · BROCKSHIRE, TEXAS · 92-445

SHOW API MONOGRAM IF REQUIRED

TAG TO BE MARKED PER GVMPS 11260 IN ACCORDANCE WITH S.O.

NOTE: LONG BEACH, CA; TAG #92-510 LISC NO. 60-0075.1

SERIAL NO.'S 01GA0905-1-1-14

Guillermo Casero 1-31-02
ASSEMBLER DATE

Johnnie R. Konarik 1-31-02
QUALITY ASSURANCE DATE

DATE _____ DATE _____

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LTR	DATE	REVISION	BY	PREPARED BY:	DATE:	GENERAL VALVE CO.
K	11/18/96	C.O. 10226	DS/GMS	DS	1/91	
L	2/10/99	C.O. 10465	DS/GMS	APPROVED BY: GMS	DATE: 1/91	SUB-SECTION: N/A DISTRIBUTION: GRSM, QM
M	07/13/00	C.O. 10655	MH	BOOK: 3 SECTION: DESIGN WORKSHEETS		
				GENERAL VALVE COMPANY		GVMPS 12103
				TWIN SEAL & OHC VALVE		
				INSPECTION & TEST REPORT CERTIFICATION		SHT 1 OF 2

ALLES ORDER: 012A0905

DATE: 1-31-02

ITEM NO.	HEAT NUMBER							CURE DATE	MOTOR
	BODY	BONNET	LOWER PLATE	HUB	UPPER BEARING RETAINER	LOWER BEARING RETAINER	SLIP		
-1	41290301	1A3968	MT1860				4-01		
2	41060801	1A3968	MT1860				4-01		
3	41290301	1A3968	MT1860				4-01		
4	46280301	1A3968	MT1860				4-01		
5	41300301	1A3968	MT1860				4-01		
6	41300301	1A3968	MT1860				4-01		
7	46280301	1A3968	MT1860				4-01		
8	46280301	1A3968	MT1860				4-01		
9	46280301	1A3968	MT1860				4-01		
10	41300301	1A3968	MT1860				4-01		
11	41300301	1A3968	MT1860				4-01		
12	41060801	1A3968	MT1860				4-01		
13	41300301	1A3968	MT1860				4-01		
14	41300301	1A3968	MT1860				4-01		

REVISION M

GENERAL VALVE CO.

GENERAL VALVE COMPANY
TWIN SEAL & OHC VALVE
INSPECTION & TEST REPORT CERTIFICATION

GVMPS
12103
SHT 2 OF 2

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General Valve Company

800 Koomey Road
Brookshire, Texas 77423-8803
A PCC Flow Technologies Company

GENERAL VALVE

Certificate Of Compliance

Customer: ENGINEERED VALVES SPECIALTIES

Date: MARCH 27, 2002

Customer P.O. Number: 211246

Subject Article: (2) 6" ANSI 150 FIG. CA811-H
GENERAL TWIN SEAL VALVE

Serial Number: 01GA0905-2-1/-2

It is hereby certified that all articles, materials, processes and finished parts used, are in conformance with pertinent specifications and quality requirements shown in the purchase order including API 6D. We further certify that all fasteners meet customers P.O. requirements.

Gina Allen
Quality Department

GENERAL VALVE COMPANY
TWIN SEAL & OHC VALVE
INSPECTION & TEST REPORT CERTIFICATION

SALES ORDER NO.: 016A0905 CUSTOMER: ENGINEERED VALVES SPEC

CUSTOMER P.O. NO.: 211246

FIGURE NO. CA811 SIZE 6" SERIES 150 TRIM VETON

INSPECTION

1. INSPECT AND RECORD BODY, BONNET & LOWER PLATE & HUB HEAT NUMBERS AS REQUIRED
2. CHECK FINISH ON FLANGES
3. CHECK VALVE TO SEE IF PROPERLY DEBURRED
4. CHECK LINE-UP OF PORTS
5. CHECK MARKINGS ON VALVE
6. CHECK FLOW DIRECTION ON ALL RELIEF ASSEMBLIES
7. OPERATE MECHANISM & FUNCTIONALLY TEST ALL ACCESSORIES
8. IF SO SUPPLIED, CHECK ELECTRIC ACTUATOR TORQUE AND LIMIT SWITCHES WITH OHM METER FOR PROPER OPERATION
9. IF SO SUPPLIED, RUN MOTOR OPERATED VALVE AND SET TORQUE AND LIMIT SWITCHES. (LIST SERIAL NO. OF MOTOR OPERATED VALVE ON BACK OF THIS CERTIFICATION.)
10. CHECK TO SEE THAT THE ASSEMBLY IS CONSISTENT WITH SALES ORDER REQUIREMENTS.
11. IF API MONOGRAM IS REQUIRED ACKNOWLEDGE APPLICATION

PRESSURE TESTS TO:

API 598 _____ API 60 _____
API 600 _____ OTHER _____

HYDROSTATIC SHELL TEST

PSI 450 DURATION 5

HIGH PRESSURE SEAT TEST

PSI 300 DURATION 5

LOW PRESSURE SEAT TEST

MEDIA (AIR) (WATER)

PSI _____ DURATION _____

SIZE	<u>6</u>	MODEL	<u>CA811</u> <u>DBB</u>
API CLASS	<u>150</u>	504 F/F	
100' F MOP	<u>275</u>	MOT' F	<u>350</u>
BODY	<u>A216WC3</u>	SEAT	<u>VETON</u>
MFG DATE	<u>1-02</u>		
SERIAL NO.	<u>016A0905-2-1</u>		
GENERAL VALVE - BROOKSHIRE, TEXAS 92-445			

SHOW API MONOGRAM IF REQUIRED

TAG TO BE MARKED PER GVMPs 11260 IN ACCORDANCE WITH S.O.

NOTE: LONG BEACH, CA: TAG #92-510 LISC NO. 60-0075.1

SERIAL NO.'S 016A0905-2-1-2

R. Nair 2-2-02
ASSEMBLER DATE

Johanne R. Konarik 2-2-02
QUALITY ASSURANCE DATE

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K	11/18/96	C.O. 10226	DS/GMS	DS	1/91	
L	2/10/99	C.O. 10465	DS/GMS	GMS	1/91	
M	07/13/00	C.O. 10655	MH	BOOK: 3	SECTION: DESIGN WORKSHEETS	DISTRIBUTION: GRSM, QM
GENERAL VALVE COMPANY						GVMPs
TWIN SEAL & OHC VALVE						12103
INSPECTION & TEST REPORT CERTIFICATION						SHT 1 OF 2

SALES ORDER: 016A0905 DATE: 2-2-01

ITEM NO.	HEAT NUMBER							MOTOR	
	BODY	BONNET	LOWER PLATE	HUB	UPPER BEARING RETAINER	LOWER BEARING RETAINER	SLIP	SERIAL # / SECONDS	
2-1	45131201	46137	180313	545693			4-01		
2-2	41071201	46137	180313	545693			4-01		

REVISION M			GENERAL VALVE CO.	
TITLE				
GENERAL VALVE COMPANY			GYMPS	
TWIN SEAL & OHC VALVE			12103	
INSPECTION & TEST REPORT CERTIFICATION			SHT 2 OF 2	

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General Valve Company

800 Koomey Road

Brookshire, Texas 77423-8803

A PCC Flow Technologies Company

GENERAL VALVE

Certificate

Of Compliance

Customer: ENGINEERED VALVES SPECIALTIES

Date: MARCH 27, 2002

Customer P.O. Number: 211246

Subject Article: (2) 8" ANSI 150 FIG. C811-H
GENERAL TWIN SEAL VALVE

Serial Number: 01GA0905-3-1/-2

It is hereby certified that all articles, materials, processes and finished parts used, are in conformance with pertinent specifications and quality requirements shown in the purchase order including API 6D. We further certify that all fasteners meet customers P.O. requirements.

Gina Allen
Quality Department

GENERAL VALVE COMPANY
TWIN SEAL & OHC VALVE
INSPECTION & TEST REPORT CERTIFICATION

SALES ORDER NO.: 01CA0905 CUSTOMER: ENGINEERED-VALVES-SPECIALI
 CUSTOMER P.O. NO.: 211246
 FIGURE NO. C811 SIZE 8 SERIES 150 TRIM VITON

INSPECTION

1. INSPECT AND RECORD BODY, BONNET & LOWER PLATE & HUB HEAT NUMBERS AS REQUIRED
2. CHECK FINISH ON FLANGES.
3. CHECK VALVE TO SEE IF PROPERLY DEBURRED
4. CHECK LINE-UP OF PORTS
5. CHECK MARKINGS ON VALVE.
6. CHECK FLOW DIRECTION ON ALL RELIEF ASSEMBLIES
7. OPERATE MECHANISM & FUNCTIONALLY TEST ALL ACCESSORIES
8. IF SO SUPPLIED, CHECK ELECTRIC ACTUATOR TORQUE AND LIMIT SWITCHES WITH OHM METER FOR PROPER OPERATION N/A
9. IF SO SUPPLIED, RUN MOTOR OPERATED VALVE AND SET TORQUE AND LIMIT SWITCHES. (LIST SERIAL NO. OF MOTOR OPERATED VALVE ON BACK OF THIS CERTIFICATION.) N/A
10. CHECK TO SEE THAT THE ASSEMBLY IS CONSISTENT WITH SALES ORDER REQUIREMENTS.
11. IF API MONOGRAM IS REQUIRED ACKNOWLEDGE APPLICATION

PRESSURE TESTS TO:

API 598 _____ API 60
 API 600 _____ OTHER _____

HYDROSTATIC SHELL TEST

PSI 450 DURATION 5 MIN

HIGH PRESSURE SEAT TEST

PSI 300 DURATION 5 MIN

LOW PRESSURE SEAT TEST

MEDIA (AIR) (WATER)

PSI _____ DURATION _____

SHOW API MONOGRAM IF REQUIRED

SIZE	<u>8</u>	MODEL	<u>C811</u>	DBB	
API CLASS	<u>150</u>	804 F/F			
100°F MOP	<u>275</u>	NOT F	<u>340</u>		
BODY	<u>A216WCB</u>	SEAT	<u>VITON</u>		
MFG DATE	<u>1-02</u>				
SERIAL NO.	<u>01CA0905</u>				

GENERAL VALVE - BROCKSHIRE, TEXAS 92-445

TAG TO BE MARKED PER
 GVMPS 11260
 IN ACCORDANCE
 WITH S.O.

NOTE: LONG BEACH, CA: TAG #92-310
 LISC NO. 80-0075.1

SERIAL NO'S 01CA0905-3-1-2

ASSEMBLER

DATE

QUALITY ASSURANCE

DATE

DATE

DATE

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LTR	DATE	REVISION	BY	PREPARED BY	DATE	GENERAL VALVE CO.	
K	11/18/96	C.O. 10226	DS/GMS	DS	1/91		
L	2/10/99	C.O. 10465	DS/GMS	GMS	1/91		
M	07/13/00	C.O. 10655	MHV	BOOK: 3	SECTION: DESIGN WORKSHEETS	SUB-SECTION: N/A	DISTRIBUTION: GRSM:QM
				GENERAL VALVE COMPANY		GVMPS	
				TWIN SEAL & OHC VALVE		12103	
				INSPECTION & TEST REPORT CERTIFICATION		SHT. 1 OF 2	

DES ORDER: 016A0905

DATE: 1-29-02

MOTOR	HEAT NUMBER					CURE DATE	
	BODY	BONNET	LOWER PLATE	HUB	UPPER BEARING RETAINER	LOWER BEARING RETAINER	SLIP
	145080301	06892	1D2095	S39463			2-01
	243020801	2B5082	2A7951	29418			2-01

REVISION: M

GENERAL VALVE CO.

TITLE: GENERAL VALVE COMPANY
 TWIN SEAL & OHC VALVE
 INSPECTION & TEST REPORT CERTIFICATION

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General Valve Company

800 Koomey Road

Brookshire, Texas 77423-8803

A PCC Flow Technologies Company

GENERAL VALVE

Certificate

Of Compliance

Customer: **ENGINEERED VALVES SPECIALTIES**

Date: **MARCH 27, 2002**

Customer P.O. Number: **211246**

Subject Article: **(2) 10" ANSI 150 FIG. CA811-H
GENERAL TWIN SEAL VALVE**

Serial Number: **01GA0905-4-1/-2**

It is hereby certified that all articles, materials, processes and finished parts used, are in conformance with pertinent specifications and quality requirements shown in the purchase order including API 6D. We further certify that all fasteners meet customers P.O. requirements.

Gina Allen

Quality Department

GENERAL VALVE COMPANY
TWIN SEAL & OHC VALVE
INSPECTION & TEST REPORT CERTIFICATION

SALES ORDER NO.: 016A0905 CUSTOMER: ENGINEERED VALVES SPEC.

CUSTOMER P.O. NO.: 211246

FIGURE NO. CAB116 SIZE 10" SERIES 150 TRIM VETON

INSPECTION	PRESSURE TESTS TO:
1. INSPECT AND RECORD BODY, BONNET & LOWER PLATE & HUB HEAT NUMBERS AS REQUIRED <input checked="" type="checkbox"/>	API 598 _____ API 60 _____
2. CHECK FINISH ON FLANGES <input checked="" type="checkbox"/>	API 600 _____ OTHER _____
3. CHECK VALVE TO SEE IF PROPERLY DEBURRED <input checked="" type="checkbox"/>	<u>HYDROSTATIC SHELL TEST</u>
4. CHECK LINE-UP OF PORTS <input checked="" type="checkbox"/>	PSI <u>450</u> DURATION <u>5</u> _____
5. CHECK MARKINGS ON VALVE <input checked="" type="checkbox"/>	<u>HIGH PRESSURE SEAT TEST</u>
6. CHECK FLOW DIRECTION ON ALL RELIEF ASSEMBLIES <input checked="" type="checkbox"/>	PSI <u>300</u> DURATION <u>5</u> _____
7. OPERATE MECHANISM & FUNCTIONALLY TEST ALL ACCESSORIES <input checked="" type="checkbox"/>	<u>LOW PRESSURE SEAT TEST</u>
8. IF SO SUPPLIED, CHECK ELECTRIC ACTUATOR TORQUE AND LIMIT SWITCHES WITH OHM METER FOR PROPER OPERATION <input checked="" type="checkbox"/>	MEDIA (AIR) (WATER)
9. IF SO SUPPLIED, RUN MOTOR OPERATED VALVE AND SET TORQUE AND LIMIT SWITCHES. (LIST SERIAL NO. OF MOTOR OPERATED VALVE ON BACK OF THIS CERTIFICATION.) <input checked="" type="checkbox"/>	PSI _____ DURATION _____
10. CHECK TO SEE THAT THE ASSEMBLY IS CONSISTENT WITH SALES ORDER REQUIREMENTS. <input checked="" type="checkbox"/>	
11. IF API MONOGRAM IS REQUIRED ACKNOWLEDGE APPLICATION <input checked="" type="checkbox"/>	

SIZE	<u>10</u>	MODEL	<u>CAB116</u> DBB
API CLASS	<u>150</u>	604 F/F	
100' F MOP	<u>225</u>	MOT' F	<u>350</u>
BODY	<u>A216WC6</u>	SEAT	<u>VETON</u>
MFG DATE	<u>1-02</u>		
SERIAL NO.	<u>016A0905-4-1</u>		
GENERAL VALVE - BROCKSHIRE, TEXAS 92-445			

SHOW API MONOGRAM IF REQUIRED

TAG TO BE MARKED PER GVMPS 11260 IN ACCORDANCE WITH S.O.

NOTE: LONG BEACH, CA; TAG #92-510 LISC NO. 6D-0075.1

SERIAL NO.'S 016A0905-4-1-2

R. Naville 2-2-02
ASSEMBLER DATE

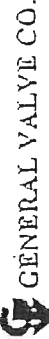
Johnnie R. Konarik 2-2-02
QUALITY ASSURANCE DATE

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LTR	DATE	REVISION	BY	PREPARED BY:	DATE:	GENERAL VALVE CO.
K	11/18/96	C.O. 10226	DS/GMS	DS	1/91	
L	2/10/99	C.O. 10465	DS/GMS	GMS	1/91	
M	07/13/00	C.O. 10655	MH	BOOK: 3 SECTION: DESIGN WORKSHEETS	SUB-SECTION: N/A DISTRIBUTION: GRSM, QM	
				GENERAL VALVE COMPANY		GVMPS
				TWIN SEAL & OHC VALVE		12103
				INSPECTION & TEST REPORT CERTIFICATION		SHT 1 OF 2

SALES ORDER: 016A0905 DATE: 2-2-02

ITEM NO.	HEAT NUMBER							CURE DATE		MOTOR SERIAL # / SECONDS
	BODY	BONNET	LOWER PLATE	HUB	UPPER BEARING RETAINER	LOWER BEARING RETAINER	SLIP			
4-1	41080301	2B6087	2A9222	539463				4-01		
2	440704d	2B6087	2A9222	539463				4-01		



GENERAL VALVE CO.

REVISION M

TITLE: GENERAL VALVE COMPANY TWIN SEAL & OHC VALVE INSPECTION & TEST REPORT CERTIFICATION

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General Valve Company

800 Koomey Road
Brookshire, Texas 77423-8803
A PCC Flow Technologies Company

GENERAL VALVE

Certificate Of Compliance

Customer: **ENGINEERED VALVES SPECIALTIES**

Date: **MARCH 27, 2002**

Customer P.O. Number: **211246**

Subject Article: **(7) 12" ANSI 150 FIG. C811-G
GENERAL TWIN SEAL VALVE**

Serial Number: **01GA0905-5-1/-7**

It is hereby certified that all articles, materials, processes and finished parts used, are in conformance with pertinent specifications and quality requirements shown in the purchase order including API 6D. We further certify that all fasteners meet customers P.O. requirements.

Gina Allen
Quality Department

GENERAL VALVE COMPANY
TWIN SEAL & OHC VALVE
INSPECTION & TEST REPORT CERTIFICATION

SALES ORDER NO. 016A0905 CUSTOMER: ENGINEERED VALVES SPEC
 CUSTOMER P.O. NO.: 211246
 FIGURE NO. C8116 SIZE 12" SERIES 150 TRIM VETON

INSPECTION	PRESSURE TESTS TO:
1. INSPECT AND RECORD BODY, BONNET & LOWER PLATE & HUB HEAT NUMBERS AS REQUIRED <input checked="" type="checkbox"/>	API 598 _____ API 60 <input checked="" type="checkbox"/>
2. CHECK FINISH ON FLANGES <input checked="" type="checkbox"/>	API 600 _____ OTHER _____
3. CHECK VALVE TO SEE IF PROPERLY DEBURRED <input checked="" type="checkbox"/>	HYDROSTATIC SHELL TEST
4. CHECK LINE-UP OF PORTS <input checked="" type="checkbox"/>	PSI <u>450</u> DURATION <u>15</u>
5. CHECK MARKINGS ON VALVE <input checked="" type="checkbox"/>	HIGH PRESSURE SEAT TEST
6. CHECK FLOW DIRECTION ON ALL RELIEF ASSEMBLIES <input checked="" type="checkbox"/>	PSI <u>300</u> DURATION <u>5</u>
7. OPERATE MECHANISM & FUNCTIONALLY TEST ALL ACCESSORIES <input checked="" type="checkbox"/>	LOW PRESSURE SEAT TEST
8. IF SO SUPPLIED, CHECK ELECTRIC ACTUATOR TORQUE AND LIMIT SWITCHES WITH OHM METER FOR PROPER OPERATION <input checked="" type="checkbox"/>	MEDIA (AIR) (WATER)
9. IF SO SUPPLIED, RUN MOTOR OPERATED VALVE AND SET TORQUE AND LIMIT SWITCHES. (LIST SERIAL NO. OF MOTOR OPERATED VALVE ON BACK OF THIS CERTIFICATION.) <input checked="" type="checkbox"/>	PSI _____ DURATION _____
10. CHECK TO SEE THAT THE ASSEMBLY IS CONSISTENT WITH SALES ORDER REQUIREMENTS. <input checked="" type="checkbox"/>	
11. IF API MONOGRAM IS REQUIRED ACKNOWLEDGE APPLICATION <input checked="" type="checkbox"/>	

SIZE	<u>12</u>	MODEL	<u>C811</u> <u>088</u>
API CLASS	<u>150</u>	504 F/F	
100°F MOP	<u>275</u>	NOT F	<u>350</u>
BODY	<u>A21600A</u>	SEAT	<u>VETON</u>
MFG DATE	<u>1-02</u>		
SERIAL NO.	<u>016A0905-5-1</u>		

GENERAL VALVE - BROCKSHIRE, TEXAS 92-445

SHOW API MONOGRAM IF REQUIRED

TAG TO BE MARKED PER GVMPS 11260 IN ACCORDANCE WITH S.O.

NOTE: LONG BEACH, CA; TAG #92-510 USC NO. 80-0075.1

SERIAL NO.'S 016A0905-5-1-7

A. Nail 2-2-02
 ASSEMBLER DATE

Johnnie R. Honauk 2-2-02
 QUALITY ASSURANCE DATE

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LTR	DATE	REVISION	BY	PREPARED BY:	DATE:	GENERAL VALVE CO.
K	11/18/96	C.O. 10226	DS/GMS	DS	1/91	
L	2/10/99	C.O. 10465	DS/GMS	APPROVED BY: GMS	1/91	GVMPS
M	07/13/00	C.O. 10655	MH	BOOK: 3 SECTION: DESIGN WORKSHEETS		
GENERAL VALVE COMPANY						DISTRIBUTION GRSM:QI
TWIN SEAL & OHC VALVE						12103
INSPECTION & TEST REPORT CERTIFICATION						SHT 1 OF 2

ES ORDER: 016A0905

DATE: 8-2-02

	HEAT NUMBER							CURE DATE	MOTOR
	BODY	BONNET	LOWER PLATE	HUB	UPPER BEARING RETAINER	LOWER BEARING RETAINER	SLIP		
1	42041001	17017	2B5663	30697				4-01	
2	42111001	17017	913003	30697				4-01	
3	42121001	01815067	2B5663	30697				4-01	
4	42041001	17017	2B5663	30697				4-01	
5	41121001	17017	2B5663	30697				4-01	
6	42121001	01815067	913003	30697				4-01	
7	42041001	17017	2B5663	30697				4-01	
8									
9									
10									
11									
12									
13									
14									
15									
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GENERAL VALVE CO.

REVISION M

GENERAL VALVE COMPANY
 TWIN SEAL & OHC VALVE
 INSPECTION & TEST REPORT CERTIFICATION

TITLE
 GENERAL VALVE CO.

GYMPS
 12103
 SHT 2 OF 2

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General Valve Company

800 Koomey Road
Brookshire, Texas 77423-8803
A PCC Flow Technologies Company

GENERAL VALVE

Certificate Of Compliance

Customer: **ENGINEERED VALVES SPECIALTIES**

Date: **MARCH 27, 2002**

Customer P.O. Number: **211246**

Subject Article: **(6) 16" ANSI 150 FIG. C811-G
GENERAL TWIN SEAL VALVE**

Serial Number: **01GA0905-6-1/-6**

It is hereby certified that all articles, materials, processes and finished parts used, are in conformance with pertinent specifications and quality requirements shown in the purchase order including API 6D. We further certify that all fasteners meet customers P.O. requirements.

Gina Allen
Quality Department

GENERAL VALVE COMPANY
TWIN SEAL & OHC VALVE
INSPECTION & TEST REPORT CERTIFICATION

SALES ORDER NO.: 01GA0905 CUSTOMER: Engineered Valves Specialties
 CUSTOMER P.O. NO.: 211246
 FIGURE NO. C811 SIZE 16 SERIES 150 TRIM Viton

INSPECTION

1. INSPECT AND RECORD BODY, BONNET & LOWER PLATE & HUB HEAT NUMBERS AS REQUIRED
2. CHECK FINISH ON FLANGES
3. CHECK VALVE TO SEE IF PROPERLY DEBURRED
4. CHECK LINE-UP OF PORTS
5. CHECK MARKINGS ON VALVE
6. CHECK FLOW DIRECTION ON ALL RELIEF ASSEMBLIES
7. OPERATE MECHANISM & FUNCTIONALLY TEST ALL ACCESSORIES
8. IF SO SUPPLIED, CHECK ELECTRIC ACTUATOR TORQUE AND LIMIT SWITCHES WITH OHM METER FOR PROPER OPERATION
9. IF SO SUPPLIED, RUN MOTOR OPERATED VALVE AND SET TORQUE AND LIMIT SWITCHES. (LIST SERIAL NO. OF MOTOR OPERATED VALVE ON BACK OF THIS CERTIFICATION.)
10. CHECK TO SEE THAT THE ASSEMBLY IS CONSISTENT WITH SALES ORDER REQUIREMENTS.
11. IF API MONOGRAM IS REQUIRED ACKNOWLEDGE APPLICATION

PRESSURE TESTS TO:

API 598 _____ API 60
 API 600 _____ OTHER _____

HYDROSTATIC SHELL TEST

PSI 450 DURATION 15

HIGH PRESSURE SEAT TEST

PSI 300 DURATION 5

LOW PRESSURE SEAT TEST

MEDIA (AIR) (WATER)

PSI _____ DURATION _____

SIZE	<u>16</u>	MODEL	<u>C811</u>	<u>DBB</u>
API CLASS	<u>150</u>	604 F/F		
100°F NOP	<u>275</u>	NOT F	<u>350</u>	LISC NO.
BODY	<u>A216WCB</u>	SEAT	<u>Viton</u>	<u>60-0075</u>
MFG DATE	<u>1-02</u>			
SERIAL NO.	<u>01GA0905-6-1</u>			

GENERAL VALVE - BROCKSHIRE, TEXAS 92-445

SHOW API MONOGRAM IF REQUIRED

TAG TO BE MARKED PER GVMPS 11260 IN ACCORDANCE WITH S.O.

NOTE: LONG BEACH, CA: TAG #92-510 LISC NO. 60-0075.1

SERIAL NO.'S. 01GA0905-6-1/6

Robert Smith 2-2-02
 ASSEMBLER DATE

Johnnie R. Konark 2-2-02
 QUALITY ASSURANCE DATE

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LTR	DATE	REVISION	BY	PREPARED BY:	DATE:	GENERAL VALVE CO.
K	11/18/96	C.O. 10226	DS/GMS	DS	1/91	
L	2/10/99	C.O. 10465	DS/GMS	GMS	1/91	
M	07/13/00	C.O. 10655	MHV	BOOK: 3 SECTION: DESIGN WORKSHEETS	SUB-SECTION: N/A DISTRIBUTION: GRSM/QM	

GENERAL VALVE COMPANY
 TWIN SEAL & OHC VALVE
 INSPECTION & TEST REPORT CERTIFICATION
 GVMPS 12103
 SHT 1 OF 2

LES ORDER: 016A0905

DATE: 2-2-02

	HEAT NUMBER								CURE DATE		MOTOR
	BODY	BONNET	LOWER PLATE	HUB	UPPER BEARING RETAINER	LOWER BEARING RETAINER	SLIP	SERIAL # / SECONDS			
1	44240201	1017955	001538	49838			1-02				
2	46080201	1017955	001538	49838			1-02				
3	44440201	1017955	001538	49838			1-02				
4	46060201	1017955	001538	49838			1-02				
5	44050301	1017955	001538	49838			1-02				
6	44280201	1017955	001538	49838			1-02				

REVISION MI GENERAL VALVE CO.

TITLE: GENERAL VALVE COMPANY TWIN SEAL & OHC VALVE INSPECTION & TEST REPORT CERTIFICATION

GENERAL VALVE CO. GYMI'S 12103 SHT 2 OF 2

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GENERAL VALVE COMPANY
 800 KOOMEY ROAD, BROOKSHIRE, TX. 77423, USA
 TELEPHONE: 1-800-926-2288 / (281) 934-6013
 FAX: 1-800-765-2266 / (281) 934-6058



Twin Seal Data Sheet

Customer: WORLEY INTERNATIONAL, INC.		Service Conditions		
Ref: / NPIP - ROOSEVELT ROADS, PUERTO RICO		Media:	S.G.	
Sales Office: Brookshire, Tx		Flow Rate:		
Quote No: 0701-35	Rev#: 0	Product Temperature: Hi Low		
Date: 24 JULY 2001		Ambient Temperature: Hi Low		
By: TRACY HAMMAC		Maximum Pressure:		
Valve Quantity: 2 PIECES		Differential Pressure:		
Valve Size: 14" C-911G's		Body & Plug Material	<input checked="" type="checkbox"/> Carbon Steel A216 WCB	
Tag No's:			<input type="checkbox"/> Steel A352 LCC Low Temp	
Model Number	<input type="checkbox"/> 800 Series Regular Port	Plug Coating	<input checked="" type="checkbox"/> Standard Nickel Plated	
	<input checked="" type="checkbox"/> 900 Series Full Port		<input type="checkbox"/> Other:	
	<input type="checkbox"/> 1600 Series S&R Regular Port		Flange Finish	<input checked="" type="checkbox"/> Standard R.F.F.E.
	<input type="checkbox"/> 1500 Series S&R Full Port			<input type="checkbox"/> Smooth Finish R.F.F.E.
<input type="checkbox"/> 400 Series Short Pattern		<input type="checkbox"/> R.T.J.		
ANSI Class	<input checked="" type="checkbox"/> 150 #	<input type="checkbox"/> 900 #	<input type="checkbox"/> Other:	
	<input type="checkbox"/> 300 #	<input type="checkbox"/> 1500 #	Included: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
	<input type="checkbox"/> 600 #	<input checked="" type="checkbox"/> API Mgrm.		
Operator Type	<input type="checkbox"/> Handwheel (Direct)	Actuator Type	<input type="checkbox"/> Electric	
	<input checked="" type="checkbox"/> Gear Op. <input checked="" type="checkbox"/> H/W <input type="checkbox"/> M/A*		<input type="checkbox"/> Hydraulic	
Slip Seals	<input checked="" type="checkbox"/> Viton		<input type="checkbox"/> Other:	Manf: Model#:
	<input type="checkbox"/> Teflon		Motor * Adaption	Torque: Turns:
	<input type="checkbox"/> GVM			Motor Voltage & Htz:
<input type="checkbox"/> Other:	Valve Cycle Time:			
Gland, Bonnet & Lower Plate O-rings	<input checked="" type="checkbox"/> Viton	Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	BUDGETARY PRICING LEVELS	
	<input type="checkbox"/> Nitrile	Bolt Circle Diam:		
<input type="checkbox"/> Other:		Bore and Key Size:		
Relief System	<input checked="" type="checkbox"/> DTR w/Manual Bleed Valve	Special Notes		
	<input type="checkbox"/> Manual Bleed Valve			
	<input type="checkbox"/> Line Relieving DTR System			
	<input type="checkbox"/> Other:			
Paint Specs	<input checked="" type="checkbox"/> Std. Red Oxide Primer	Weight: 2406 POUNDS EACH		
	<input type="checkbox"/> Other:	Unit Price: \$17,019 .00 EACH	Ext: \$ 34,038.00	
		Delivery: 14-16 WEEKS A.R.O.		



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 FAX: 1-800-765-2266 / (281) 934-6058



Twin Seal Data Sheet

Customer: WORLEY INTERNATIONAL, INC.		Service Conditions		
Ref: / NPIP - ROOSEVELT ROADS, PUERTO RICO		Media:	S.G.	
Sales Office: Brookshire, Tx		Flow Rate:		
Quote No: 0701-35	Rev#: 0	Product Temperature: Hi Low		
Date: 24 JULY 2001		Ambient Temperature: Hi Low		
By: TRACY HAMMAC		Maximum Pressure:		
Valve Quantity: 1 PIECE		Differential Pressure:		
Valve Size: 12" C-911G		Body & Plug Material	<input checked="" type="checkbox"/> Carbon Steel A216 WCB	
Tag No's:			<input type="checkbox"/> Steel A352 LCC Low Temp	
Model Number	<input type="checkbox"/> 800 Series Regular Port	Plug Coating	<input checked="" type="checkbox"/> Standard Nickel Plated	
	<input checked="" type="checkbox"/> 900 Series Full Port		<input type="checkbox"/> Other:	
	<input type="checkbox"/> 1600 Series S&R Regular Port		Flange Finish	<input checked="" type="checkbox"/> Standard R.F.F.E.
	<input type="checkbox"/> 1500 Series S&R Full Port			<input type="checkbox"/> Smooth Finish R.F.F.E.
<input type="checkbox"/> 400 Series Short Pattern		<input type="checkbox"/> R.T.J.		
ANSI Class	<input checked="" type="checkbox"/> 150 #	<input type="checkbox"/> 900 #	<input type="checkbox"/> Other:	
	<input type="checkbox"/> 300 #	<input type="checkbox"/> 1500 #	Included: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
	<input type="checkbox"/> 600 #	<input checked="" type="checkbox"/> API Mgrm.		
Operator Type	<input type="checkbox"/> Handwheel (Direct)		<input type="checkbox"/> Electric	
	<input checked="" type="checkbox"/> Gear Op. <input checked="" type="checkbox"/> H/W <input type="checkbox"/> M/A*		<input type="checkbox"/> Hydraulic	
Slip Seals	<input checked="" type="checkbox"/> Viton		<input type="checkbox"/> Other:	
	<input type="checkbox"/> Teflon		Actuator Type	
	<input type="checkbox"/> GVM			Manf: Model#:
	<input type="checkbox"/> Other:			Torque: Turns:
Gland, Bonnet & Lower Plate O-rings	<input checked="" type="checkbox"/> Viton		Motor Voltage & Htz:	
	<input type="checkbox"/> Nitrile		Valve Cycle Time:	
	<input type="checkbox"/> Other:		Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Relief System	<input checked="" type="checkbox"/> DTR w/Manual Bleed Valve		Motor * Adaption	
	<input type="checkbox"/> Manual Bleed Valve			Bolt Circle Diam:
	<input type="checkbox"/> Line Relieving DTR System			Bore and Key Size:
	<input type="checkbox"/> Other:			
Paint Specs	<input checked="" type="checkbox"/> Std. Red Oxide Primer		Special Notes	
	<input type="checkbox"/> Other:			BUDGETARY PRICING LEVELS
		Weight: 1670 POUNDS EACH		
		Unit Price: \$14,519.00 EACH	Ext: \$14,519.00	
		Delivery: 14-16 WEEKS A.R.O.		



GENERAL VALVE COMPANY
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 TELEPHONE: 1-800-926-2288 / (281) 934-6013
 FAX: 1-800-765-2266 / (281) 934-6058



Twin Seal Data Sheet

Customer: WORLEY INTERNATIONAL, INC.		Service Conditions		
Ref: / NPIP - ROOSEVELT ROADS, PUERTO RICO		Media:	S.G.	
Sales Office: Brookshire, Tx		Flow Rate:		
Quote No: 0701-35	Rev#: 0	Product Temperature: Hi Low		
Date: 24 JULY 2001		Ambient Temperature: Hi Low		
By: TRACY HAMMAC		Maximum Pressure:		
Valve Quantity: 4 PIECES		Differential Pressure:		
Valve Size: 16" C-811G's		Body & Plug Material	<input checked="" type="checkbox"/> Carbon Steel A216 WCB	
Tag No's:			<input type="checkbox"/> Steel A352 LCC Low Temp	
Model Number	<input checked="" type="checkbox"/> 800 Series Regular Port	Plug Coating	<input checked="" type="checkbox"/> Standard Nickel Plated	
	<input type="checkbox"/> 900 Series Full Port		<input type="checkbox"/> Other:	
	<input type="checkbox"/> 1600 Series S&R Regular Port		Flange Finish	<input checked="" type="checkbox"/> Standard R.F.F.E.
	<input type="checkbox"/> 1500 Series S&R Full Port			<input type="checkbox"/> Smooth Finish R.F.F.E.
	<input type="checkbox"/> 400 Series Short Pattern			<input type="checkbox"/> R.T.J.
ANSI Class	<input checked="" type="checkbox"/> 150 #	<input type="checkbox"/> 900 #	<input type="checkbox"/> Other:	
	<input type="checkbox"/> 300 #	<input type="checkbox"/> 1500 #	Included: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
	<input type="checkbox"/> 600 #	<input checked="" type="checkbox"/> API Mgrm.		
Operator Type	<input type="checkbox"/> Handwheel (Direct)		<input type="checkbox"/> Electric	
	<input checked="" type="checkbox"/> Gear Op. <input checked="" type="checkbox"/> H/W <input type="checkbox"/> M/A*		<input type="checkbox"/> Hydraulic	
Slip Seals	<input checked="" type="checkbox"/> Viton		Actuator Type	
	<input type="checkbox"/> Teflon			<input type="checkbox"/> Other:
	<input type="checkbox"/> GVM			Manf: Model#:
	<input type="checkbox"/> Other:			Torque: Turns:
Gland, Bonnet & Lower Plate O-rings	<input checked="" type="checkbox"/> Viton		Motor Voltage & Htz:	
	<input type="checkbox"/> Nitrile		Valve Cycle Time:	
	<input type="checkbox"/> Other:		Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Relief System	<input checked="" type="checkbox"/> DTR w/Manual Bleed Valve		Motor * Adaption	
	<input type="checkbox"/> Manual Bleed Valve			Bolt Circle Diam:
	<input type="checkbox"/> Line Relieving DTR System			Bore and Key Size:
	<input type="checkbox"/> Other:			
Paint Specs	<input checked="" type="checkbox"/> Std. Red Oxide Primer		Special Notes	
	<input type="checkbox"/> Other:			BUDGETARY PRICING LEVELS
		Weight: 1488 POUNDS EACH		
		Unit Price: \$7,833.00 EACH	Ext: \$ 31,332.00	
		Delivery: 3-4 WEEKS A.R.O.		



GENERAL VALVE COMPANY
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 FAX: 1-800-765-2266 / (281) 934-6058



Twin Seal Data Sheet

Customer: WORLEY INTERNATIONAL, INC.		Service Conditions		
Ref: / NPIP - ROOSEVELT ROADS, PUERTO RICO		Media:	S.G.	
Sales Office: Brookshire, Tx		Flow Rate:		
Quote No: 0701-35	Rev#: 0	Product Temperature: Hi	Low	
Date: 24 JULY 2001		Ambient Temperature: Hi	Low	
By: TRACY HAMMAC		Maximum Pressure:		
Valve Quantity: 2 PIECES		Differential Pressure:		
Valve Size: 12" C-811G's		Body & Plug Material	<input checked="" type="checkbox"/> Carbon Steel A216 WCB	
Tag No's:			<input type="checkbox"/> Steel A352 LCC Low Temp	
Model Number	<input checked="" type="checkbox"/> 800 Series Regular Port	Plug Coating	<input checked="" type="checkbox"/> Standard Nickel Plated	
	<input type="checkbox"/> 900 Series Full Port		<input type="checkbox"/> Other:	
	<input type="checkbox"/> 1600 Series S&R Regular Port		Flange Finish	<input checked="" type="checkbox"/> Standard R.F.F.E.
	<input type="checkbox"/> 1500 Series S&R Full Port			<input type="checkbox"/> Smooth Finish R.F.F.E.
<input type="checkbox"/> 400 Series Short Pattern		<input type="checkbox"/> R.T.J.		
ANSI Class	<input checked="" type="checkbox"/> 150 #	<input type="checkbox"/> 900 #	<input type="checkbox"/> Other:	
	<input type="checkbox"/> 300 #	<input type="checkbox"/> 1500 #		
	<input type="checkbox"/> 600 #	<input checked="" type="checkbox"/> API Mgrm.		
Operator Type	<input type="checkbox"/> Handwheel (Direct)		Actuator Type	
	<input checked="" type="checkbox"/> Gear Op. <input checked="" type="checkbox"/> H/W <input type="checkbox"/> M/A*			
Slip Seals	<input checked="" type="checkbox"/> Viton			Included: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	<input type="checkbox"/> Teflon			<input type="checkbox"/> Electric
	<input type="checkbox"/> GVM			<input type="checkbox"/> Hydraulic
	<input type="checkbox"/> Other:			<input type="checkbox"/> Other:
Gland, Bonnet & Lower Plate O-rings	<input checked="" type="checkbox"/> Viton			Manf: _____ Model#: _____
	<input type="checkbox"/> Nitrile			Torque: _____ Turns: _____
	<input type="checkbox"/> Other:			Motor Voltage & Htz: _____
Relief System	<input checked="" type="checkbox"/> DTR w/Manual Bleed Valve			Valve Cycle Time: _____
	<input type="checkbox"/> Manual Bleed Valve		Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	<input type="checkbox"/> Line Relieving DTR System		Bolt Circle Diam: _____	
	<input type="checkbox"/> Other:		Bore and Key Size: _____	
Paint Specs	<input checked="" type="checkbox"/> Std. Red Oxide Primer		Special Notes	
	<input type="checkbox"/> Other:			
		Weight: 844 POUNDS EACH	BUDGETARY PRICING LEVELS	
		Unit Price: \$4,927.00 EACH Ext: \$ 9,854.00		
		Delivery: 2 WEEKS A.R.O.		



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 FAX: 1-800-765-2266 / (281) 934-6058

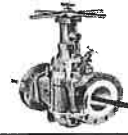


Twin Seal Data Sheet

Customer: WORLEY INTERNATIONAL, INC.		Service Conditions		
Ref: / NPIP - ROOSEVELT ROADS, PUERTO RICO		Media:	S.G.	
Sales Office: Brookshire, Tx		Flow Rate:		
Quote No: 0701-35	Rev#: 0	Product Temperature: Hi Low		
Date: 24 JULY 2001		Ambient Temperature: Hi Low		
By: TRACY HAMMAC		Maximum Pressure:		
Valve Quantity: 1 PIECE		Differential Pressure:		
Valve Size: 10" CA-811G		Body & Plug Material	<input checked="" type="checkbox"/> Carbon Steel A216 WCB	
Tag No's:			<input type="checkbox"/> Steel A352 LCC Low Temp	
Model Number	<input checked="" type="checkbox"/> 800 Series Regular Port	Plug Coating	<input checked="" type="checkbox"/> Standard Nickel Plated	
	<input type="checkbox"/> 900 Series Full Port		<input type="checkbox"/> Other:	
	<input type="checkbox"/> 1600 Series S&R Regular Port		<input checked="" type="checkbox"/> Standard R.F.F.E.	
	<input type="checkbox"/> 1500 Series S&R Full Port		<input type="checkbox"/> Smooth Finish R.F.F.E.	
<input type="checkbox"/> 400 Series Short Pattern		Flange Finish	<input type="checkbox"/> R.T.J.	
ANSI Class	<input checked="" type="checkbox"/> 150 #	<input type="checkbox"/> 900 #	<input type="checkbox"/> Other:	
	<input type="checkbox"/> 300 #	<input type="checkbox"/> 1500 #		
	<input type="checkbox"/> 600 #	<input checked="" type="checkbox"/> API Mgrm.		
Operator Type	<input type="checkbox"/> Handwheel (Direct)		Actuator Type	
	<input checked="" type="checkbox"/> Gear Op. <input checked="" type="checkbox"/> H/W <input type="checkbox"/> M/A*			
Slip Seals	<input checked="" type="checkbox"/> Viton			<input type="checkbox"/> Electric
	<input type="checkbox"/> Teflon			<input type="checkbox"/> Hydraulic
	<input type="checkbox"/> GVM			<input type="checkbox"/> Other:
	<input type="checkbox"/> Other:			Manf: Model#:
Gland, Bonnet & Lower Plate O-rings	<input checked="" type="checkbox"/> Viton			Torque: Turns:
	<input type="checkbox"/> Nitrile			Motor Voltage & Htz:
	<input type="checkbox"/> Other:			Valve Cycle Time:
Relief System	<input checked="" type="checkbox"/> DTR w/Manual Bleed Valve			Motor * Adaption
	<input type="checkbox"/> Manual Bleed Valve		Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	<input type="checkbox"/> Line Relieving DTR System		Bolt Circle Diam:	
	<input type="checkbox"/> Other:		Bore and Key Size:	
Paint Specs	<input checked="" type="checkbox"/> Std. Red Oxide Primer		Special Notes	
	<input type="checkbox"/> Other:			
		Weight: 532 POUNDS EACH	BUDGETARY PRICING LEVELS	
		Unit Price: \$3,806.00 EACH Ext: \$ 3,806.00		
		Delivery: 2 WEEKS A.R.O.		



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Twin Seal Data Sheet

Customer: WORLEY INTERNATIONAL, INC.		Service Conditions		
Ref: / NPIP - ROOSEVELT ROADS, PUERTO RICO		Media:	S.G.	
Sales Office: Brookshire, Tx		Flow Rate:		
Quote No: 0701-35	Rev#: 0	Product Temperature: Hi Low		
Date: 24 JULY 2001		Ambient Temperature: Hi Low		
By: TRACY HAMMAC		Maximum Pressure:		
Valve Quantity: 1 PIECE		Differential Pressure:		
Valve Size: 8" C-811G		Body & Plug Material	<input checked="" type="checkbox"/> Carbon Steel A216 WCB	
Tag No's:			<input type="checkbox"/> Steel A352 LCC Low Temp	
Model Number	<input checked="" type="checkbox"/> 800 Series Regular Port	Plug Coating	<input checked="" type="checkbox"/> Standard Nickel Plated	
	<input type="checkbox"/> 900 Series Full Port		<input type="checkbox"/> Other:	
	<input type="checkbox"/> 1600 Series S&R Regular Port		Flange Finish	<input checked="" type="checkbox"/> Standard R.F.F.E.
	<input type="checkbox"/> 1500 Series S&R Full Port			<input type="checkbox"/> Smooth Finish R.F.F.E.
<input type="checkbox"/> 400 Series Short Pattern	<input type="checkbox"/> R.T.J.	<input type="checkbox"/> Other:		
ANSI Class	<input checked="" type="checkbox"/> 150 #	<input type="checkbox"/> 900 #	Actuator Type	
	<input type="checkbox"/> 300 #	<input type="checkbox"/> 1500 #		Included: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	<input type="checkbox"/> 600 #	<input checked="" type="checkbox"/> API Mgrm.		<input type="checkbox"/> Electric
Operator Type	<input type="checkbox"/> Handwheel (Direct)		<input type="checkbox"/> Hydraulic	
	<input checked="" type="checkbox"/> Gear Op. <input checked="" type="checkbox"/> H/W <input type="checkbox"/> M/A*		<input type="checkbox"/> Other:	
Slip Seals	<input checked="" type="checkbox"/> Viton		Manf: _____ Model#: _____	
	<input type="checkbox"/> Teflon		Torque: _____ Turns: _____	
	<input type="checkbox"/> GVM		Motor Voltage & Htz: _____	
	<input type="checkbox"/> Other:		Valve Cycle Time: _____	
Gland, Bonnet & Lower Plate O-rings	<input checked="" type="checkbox"/> Viton		Motor * Adaption	
	<input type="checkbox"/> Nitrile			Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> Other:		Special Notes	BUDGETARY PRICING LEVELS	
Relief System	<input checked="" type="checkbox"/> DTR w/Manual Bleed Valve			
	<input type="checkbox"/> Manual Bleed Valve			
	<input type="checkbox"/> Line Relieving DTR System			
<input type="checkbox"/> Other:		Weight: 436 POUNDS EACH		
Paint Specs	<input checked="" type="checkbox"/> Std. Red Oxide Primer		Unit Price: \$3,282.00 EACH Ext: \$ 3,282.00	
	<input type="checkbox"/> Other:		Delivery: 2 WEEKS A.R.O.	



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Twin Seal Data Sheet

Customer: WORLEY INTERNATIONAL, INC.		Service Conditions		
Ref: / NPIP - ROOSEVELT ROADS, PUERTO RICO		Media:	S.G.	
Sales Office: Brookshire, Tx		Flow Rate:		
Quote No: 0701-35	Rev#: 0	Product Temperature: Hi Low		
Date: 24 JULY 2001		Ambient Temperature: Hi Low		
By: TRACY HAMMAC		Maximum Pressure:		
Valve Quantity: 1 PIECE		Differential Pressure:		
Valve Size: 6" CA-811G		Body & Plug Material	<input checked="" type="checkbox"/> Carbon Steel A216 WCB	
Tag No's:			<input type="checkbox"/> Steel A352 LCC Low Temp	
Model Number	<input checked="" type="checkbox"/> 800 Series Regular Port	Plug Coating	<input checked="" type="checkbox"/> Standard Nickel Plated	
	<input type="checkbox"/> 900 Series Full Port		<input type="checkbox"/> Other:	
	<input type="checkbox"/> 1600 Series S&R Regular Port		Flange Finish	<input checked="" type="checkbox"/> Standard R.F.F.E.
	<input type="checkbox"/> 1500 Series S&R Full Port			<input type="checkbox"/> Smooth Finish R.F.F.E.
<input type="checkbox"/> 400 Series Short Pattern	<input type="checkbox"/> R.T.J.	<input type="checkbox"/> Other:		
ANSI Class	<input checked="" type="checkbox"/> 150 #	<input type="checkbox"/> 900 #	Actuator Type	
	<input type="checkbox"/> 300 #	<input type="checkbox"/> 1500 #		Included: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	<input type="checkbox"/> 600 #	<input checked="" type="checkbox"/> API Mgrm.		<input type="checkbox"/> Electric
Operator Type	<input type="checkbox"/> Handwheel (Direct)	<input type="checkbox"/> Hydraulic		
Slip Seals	<input checked="" type="checkbox"/> Viton	<input type="checkbox"/> Other:		Manf: Model#:
Gland, Bonnet & Lower Plate O-rings	<input type="checkbox"/> Nitrile	<input type="checkbox"/> Other:		Torque: Turns:
Relief System	<input checked="" type="checkbox"/> DTR w/Manual Bleed Valve	Motor * Adaption	Motor Voltage & Htz:	
	<input type="checkbox"/> Manual Bleed Valve		Valve Cycle Time:	
	<input type="checkbox"/> Line Relieving DTR System		Required: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
	<input type="checkbox"/> Other:		Bolt Circle Diam:	
Paint Specs	<input checked="" type="checkbox"/> Std. Red Oxide Primer	Special Notes	Bore and Key Size:	
	<input type="checkbox"/> Other:		BUDGETARY PRICING LEVELS	
		Weight:	214 POUNDS EACH	
		Unit Price:	\$2,122.00 EACH Ext: \$ 2,122.00	
		Delivery:	2 WEEKS A.R.O.	



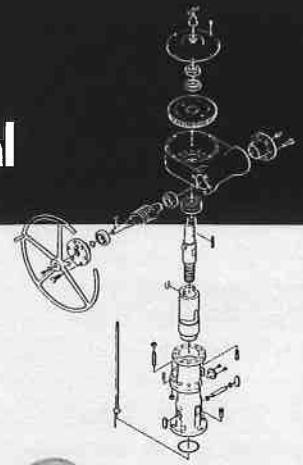
NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO



J-09 Manufacturers Catalog Data - Valves

GENERAL TWIN SEAL™

Operation, Maintenance & Service Manual



SCOPE

Included in the following pages you will find assembly drawings, exploded views, parts lists, assembly tips, operational descriptions and routine maintenance requirements for the current design of the General Twin Seal™.

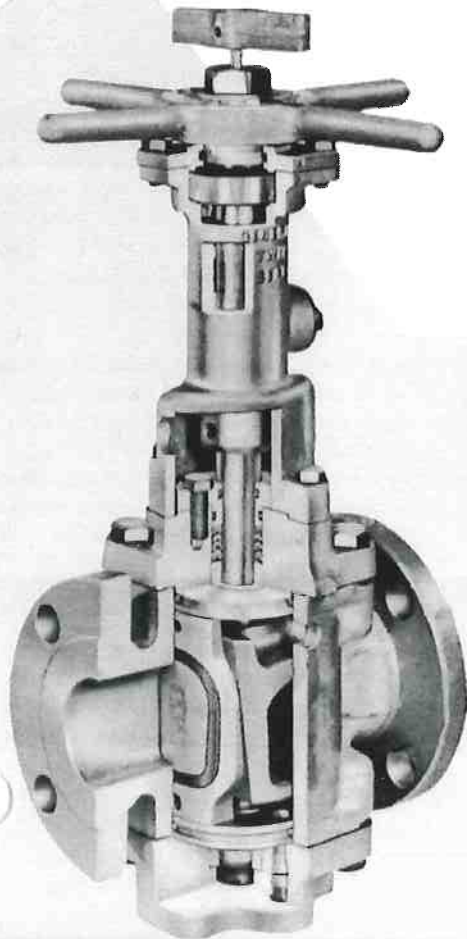


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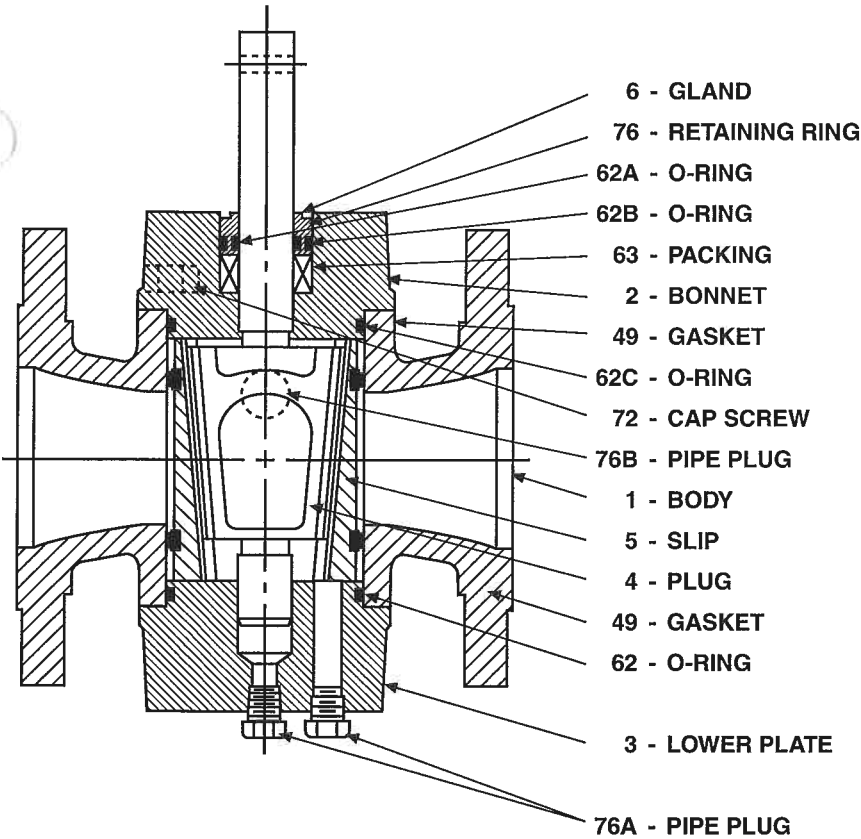
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INTEGRAL BUSHING/RETAINING RING GLAND

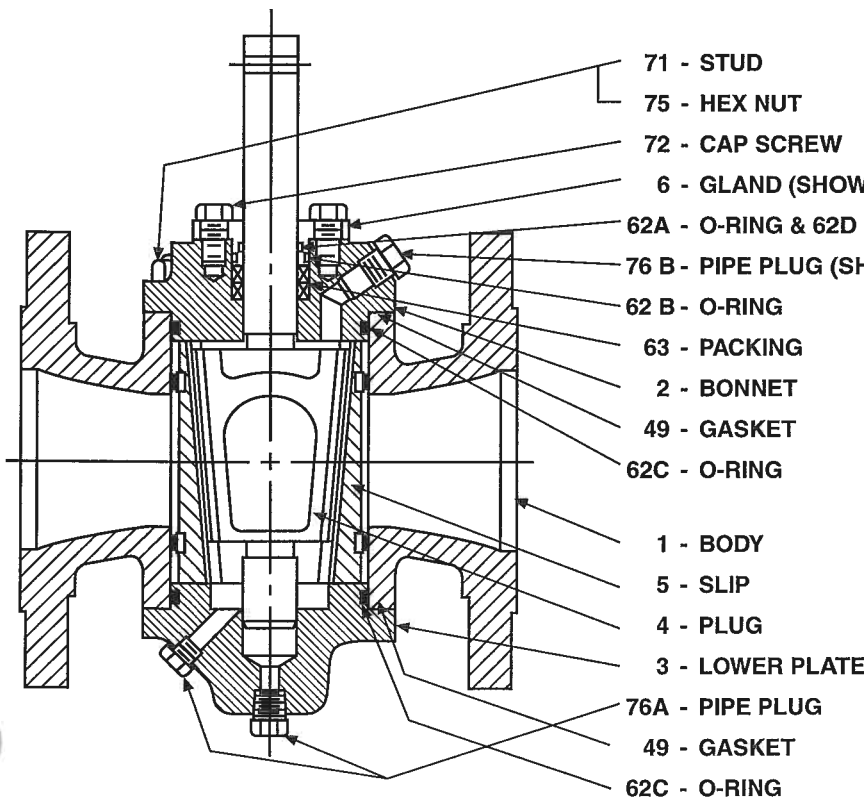


Typical Arrangement of

2"	C811
2"	C821
3"	CA811
3"	CA821

The smallest of the twin seal valves do not require discrete bushings due to minimal hydro seating forces within the valve. Also note that due to the size of the operator, the gland is held in by a retaining ring backed up by the operator housing.

INTEGRAL BUSHING/BOLTED GLAND

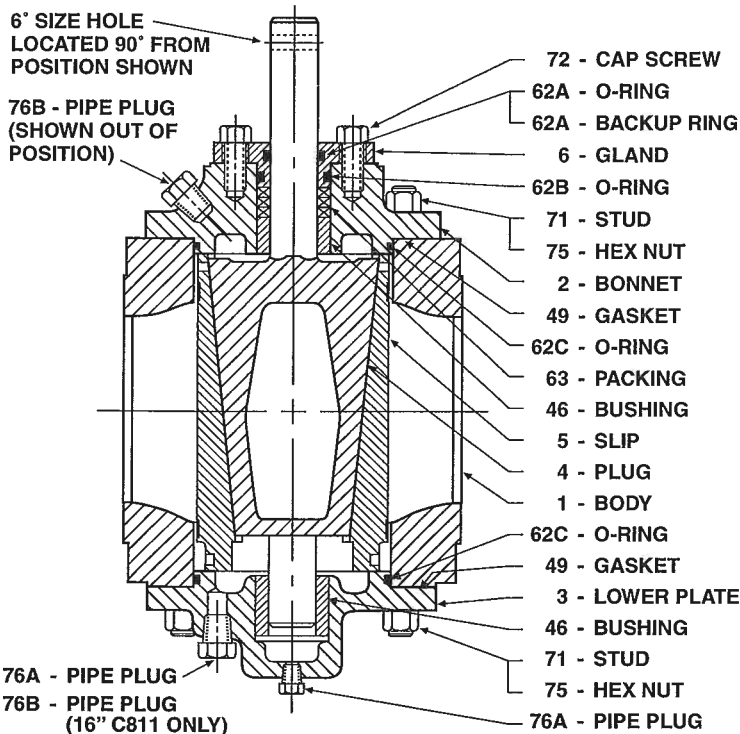


Typical Arrangement of

4"	C811
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These units do not require discrete bushings due to small hydro seating forces, incorporating a slightly larger operator however, allows bolted glands to be employed.

BUSHINGS/ONE GLAND

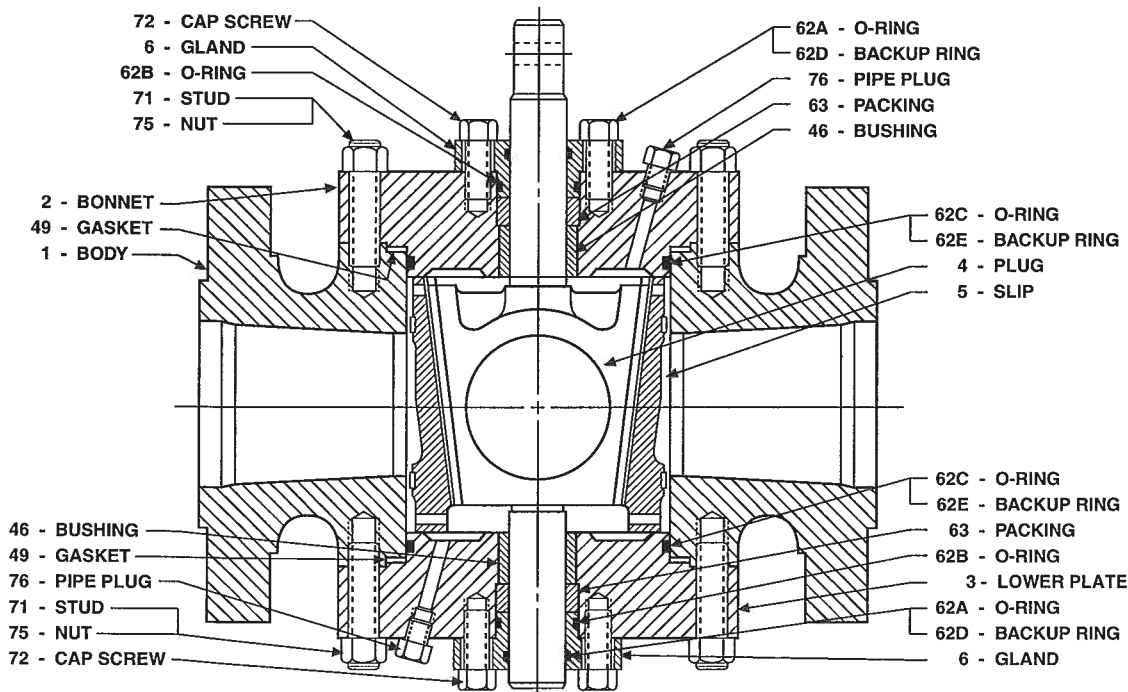


Typical Arrangement of

1 1/2"	C921	6"	C911	12"	C811
2"	C841	6"	C921	12"	C821
2"	C851	6"	C941	12"	A1911
2"	C861	8"	C411	12"	C921
2"	C911	8"	C421	14"	C811
2"	C921	8"	C811	14"	C821
2"	C941	8"	C821	14"	C911
3"	C911	8"	C841	16"	C411
4"	C821	8"	C911	16"	C811
4"	C841	8"	C921	16"	C821
4"	C911	10"	C411	16"	C921
4"	C921	10"	C421	18"	C411
4"	C941	10"	CA811	18"	C811
6"	C411	10"	C821	20"	C411
6"	C421	10"	C911	20"	C421
6"	C821	10"	C921	20"	CA811
6"	C841	12"	C411	24"	C411
6"	CA811	12"	C421	24"	C421

This most popular General Twin Seal design employs bushings and requires a single gland.

BUSHINGS/TWO GLANDS



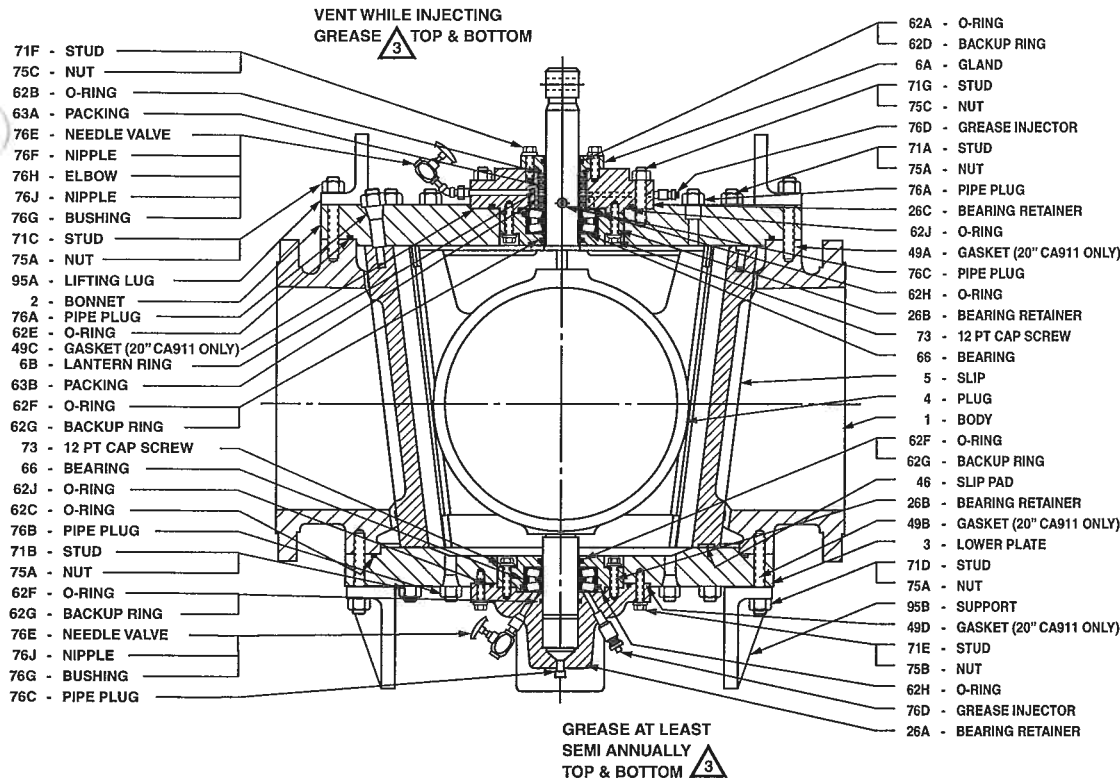
Typical Arrangement of

3"	C851
3"	C861
4"	C851
6"	C851

Higher pressure class valves employ the balanced plug design to minimize plug hydro forces which in turn requires two glands.



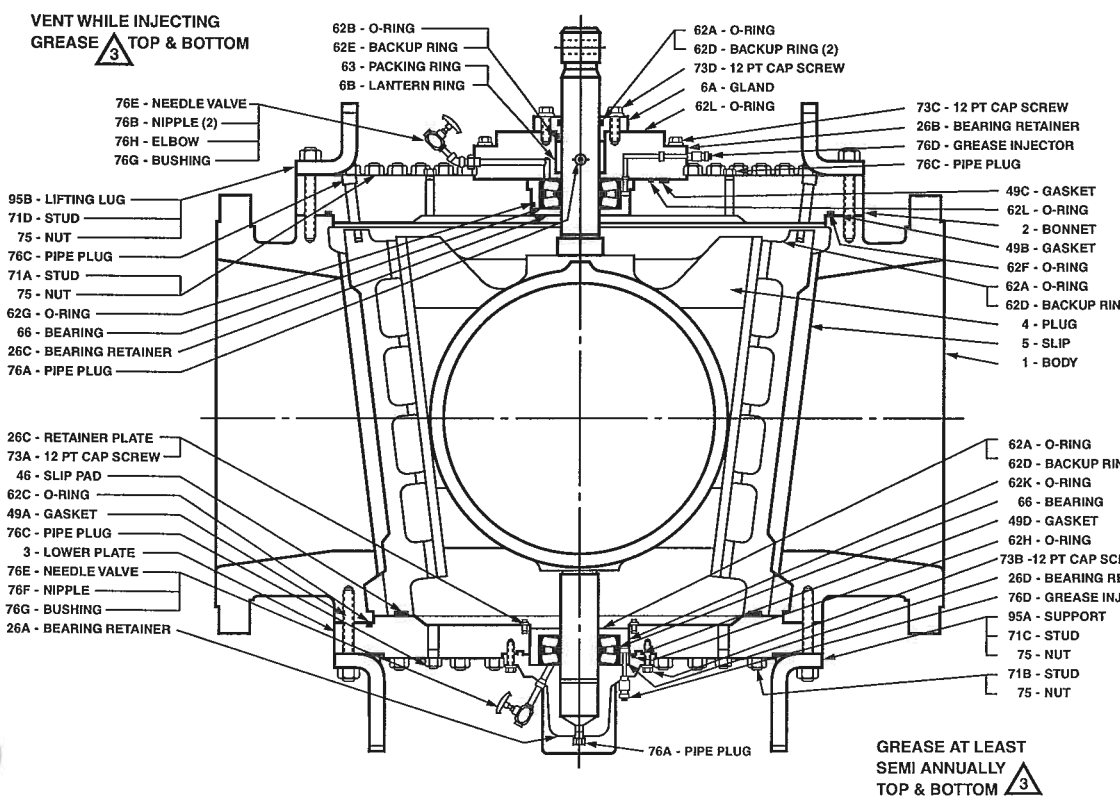
BEARINGS/DUAL RETENTION



Typical Arrangement of	
12"	C941
14"	C841
16"	C921
18"	CA821
20"	CA821
20"	CA841
20"	C841
20"	C911
20"	CA911
20"	CA921
24"	CA811
24"	C811
24"	C821
24"	CA821
28"	C811
30"	C821

As valve size increases so does the plug load, therefore, these sizes require bearings.

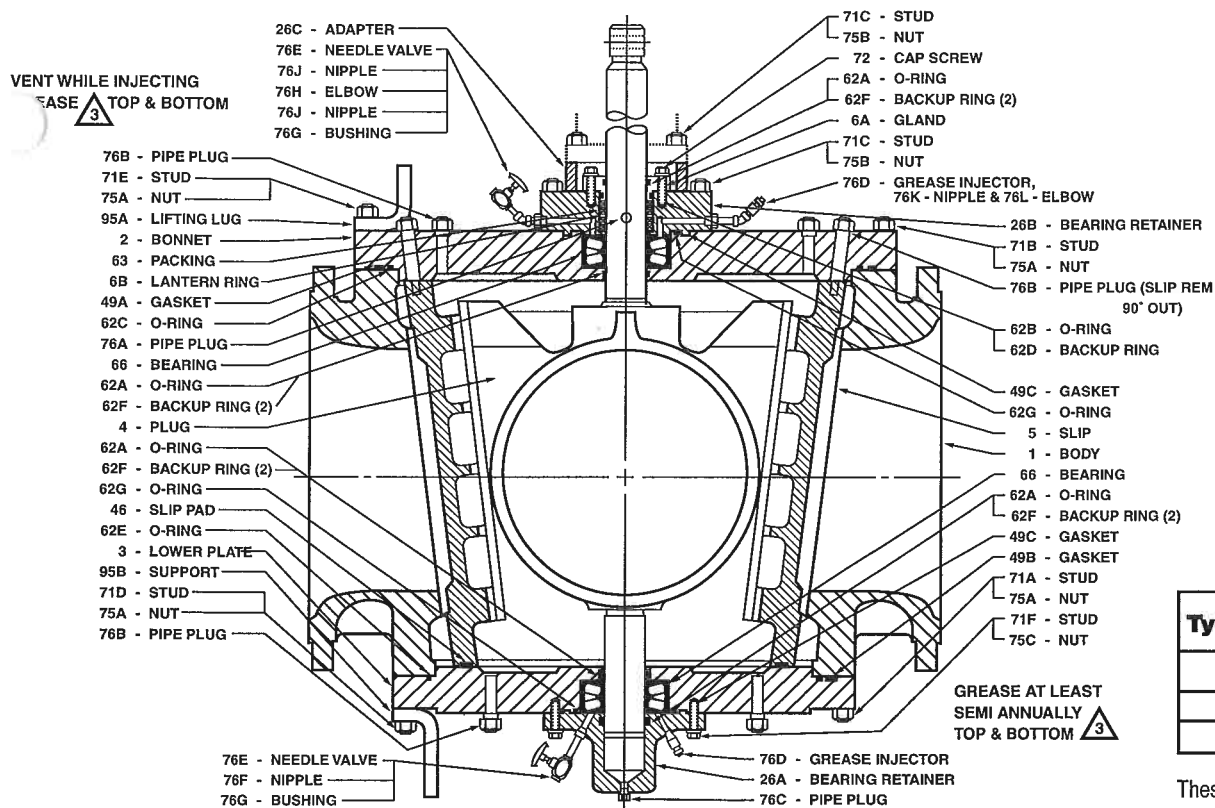
BEARINGS/DUAL RETENTION



Typical Arrangement of	
36"	CA811

This valve requires bearings. The inner bearing retainer is slightly different than the one above.

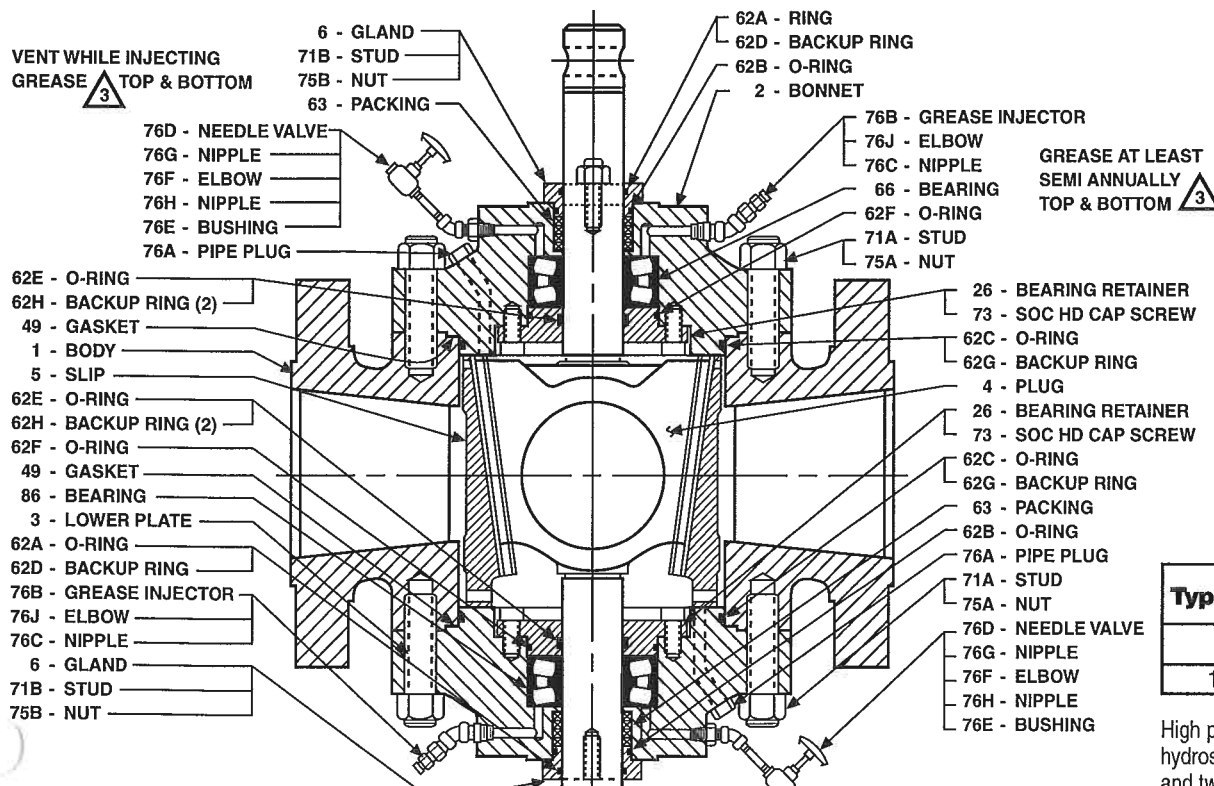
BEARINGS/INTERNALLY & EXTERNALLY RETAINED



Typical Arrangement of	
10"	CB841
10"	C941
12"	CB841

These valve sizes require bearings.

BEARINGS/INTERNALLY RETAINED ^W/TWO GLANDS



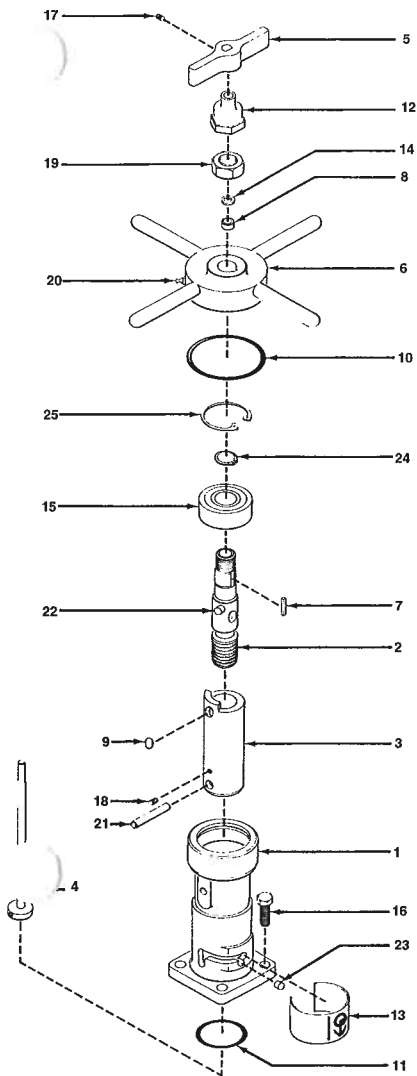
Typical Arrangement of	
8"	C851
10"	C851

High pressures require hydrostatically balanced plugs and two glands.



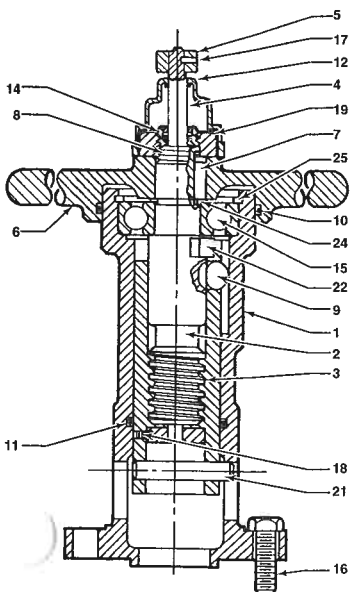
TWIN SEAL™ MODEL 375 H

Exploded View



375 H			
Item No.	Part No.	Description	Req'd
1	21-419	Operator Housing	1
2	22-417	Upper Stem	1
3	22-418	Lower Stem	1
4	27-418	Indicator Shaft	1
5	27-419	Indicator Flag	1
6	28-406	Handwheel	1
7	45-411	Key	1
8	46-425	Bushing	1
9	48-405	Roller	1
10	50-402	Grease Retainer	1
11	62-32	O-Ring	1
12	64-415	Protector	1
13	64-417	Insignia Plate	1
14	65-402	Grease Seal	1
15	66-409	Ball Bearing	1
16	72-5	Cap Screw	4
17	74-6	Screw	1
18	74-9	Set Screw	1
19	75-434	Nut	1
20	76-411	Lube Fitting	1
21	77-407	Guide Pin	1
22	77-423	Drive Pin *	1
23	77-453	Roll Pin	1
24	78-413	Retaining Ring	1
25	78-414	Retaining Ring	1

Cross Section



375 H Is Used on Models

2"	C811
2"	C821
3"	CA811
3"	CA821

OPERATOR DIS-ASSEMBLY

1. Unscrew (17) and remove indicator flag (5).
2. Remove the stem protector (12).
3. Remove the handwheel nut (19), handwheel (6), key (7) and grease retainer ring (10).
4. Remove the retainer ring (25) and pull out the upper stem (2) with lower stem (3), bearing (15), roller (9) and indicator shaft sub-assembly (4) out through the top of the housing (1).
5. Remove set-screw (18) from bottom of lower stem and push indicator shaft sub-assembly (4) out through the bottom of the lower stem.
6. Separate the stems and remove the retaining ring (24) and the bearing (15) from the upper stem.
7. Remove grease seal (14) and bushing (8) (if req'd) from top of upper stem (2).
8. Remove O-Ring (11) from inside of housing (1).

OPERATOR ASSEMBLY

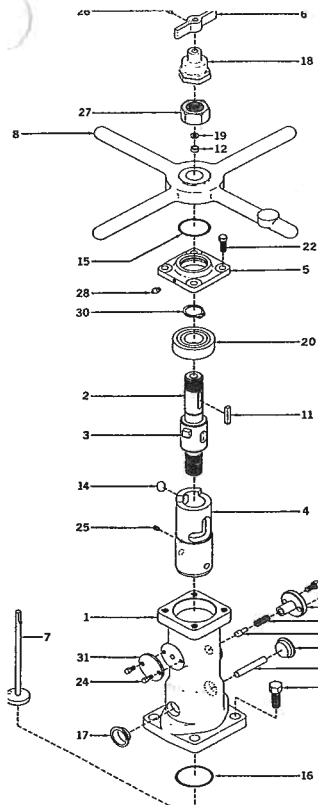
1. Install O-Ring (11) in housing (1).
2. Place the bearing (15) on the top of the upper stem (2). Install retaining ring (24).
3. Apply a liberal coating of grease to all surfaces of upper stem (2) and inside and outside of lower stem (3).
4. Thread the upper stem and lower stem together such that the drive pin (22) in the upper stem comes against the shoulder at the TOP of the lower stem (3) and the detent recess in the upper stem is exactly in line with roller opening in the lower stem.

NOTE: This operation may require several attempts as the threads are multiple start and do not always assemble correctly with the first try.

5. Install the indicator shaft sub-assembly (4) up through both stems. Align the detent hole in the indicator disc with the threaded hole in the lower stem and fasten with set screw (18). Set screw must be below the outside surface of the lower stem.
6. Place the roller (9) in the side opening of the lower stem. A liberal application of grease will hold the roller in position.
7. Place the stem assembly into the housing taking care that roller is aligned with roller groove in housing. Push the entire assembly down until the bearing rests on the shoulder in the housing.
8. Install the retaining ring (25) in the top of the housing (1).
9. Install grease retainer (10) in handwheel (6) and place handwheel and key (7) on upper stem. Install bushing (8) and grease seal (14) in handwheel nut (19). Screw the nut on the upper stem and tighten down on handwheel securely.
10. Install stem protector (12).
11. Install indicator flag (5) and secure with screw (17).

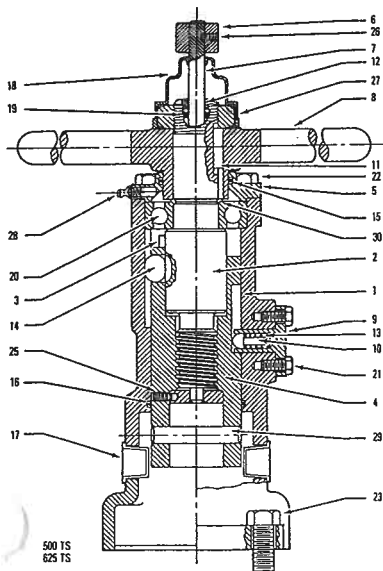
* not available separately

Exploded View



Item No.	500 H Part No.	625 H Part No.	Description
1	21-411	21-407	Operator Housing
2	22-408	22-411	Upper Stem
3	41-405	41-406	Drive Pin*
4	22-409	22-413	Lower Stem
5	26-408	26-405	Housing Cap
6	27-406	27-406	Indicator Flag
7	27-404	27-438	Indicator Shaft
8	28-409	28-401	Handwheel
9	41-403	41-403	Guide Pin
10	41-404	41-404	Detent Pin
11	45-401	45-413	Key
12	46-424	46-424	Bushing
13	47-401	47-401	Spring
14	48-401	48-403	Roller
15	62-17	62-17	O-Ring
16	62-18	62-22	O-Ring
17	64-414	64-405	Plastic Plug
18	64-411	64-412	Protector
19	65-401	65-401	Grease Seal
20	66-402	66-403	Ball Bearing
21	72-4	72-4	Cap Screw
22	72-5	72-6	Cap Screw
23	72-6	72-11	Cap Screw
24	72-21	72-21	Cap Screw
25	74-1	74-3	Set Screw
26	73-28	74-6	Screw
27	75-427	75-429	Hex Nut
28	76-411	76-411	Lube Fitting
29	77-402	77-403	Coupling Pin
30	78-403	78-404	Retaining Ring
31	93-413	93-413	Cover

Cross Section



625 H Is Used on Models:

2"	C851	2"	C941
2"	C861	4"	C941
3"	C851	6"	C911
3"	C861	6"	C921
4"	C841		
4"	C851		
6"	C821		
8"	C811		
10"	CA811		

500 H Is Used on Models:

2"	C841	2"	C921
3"	C841	3"	C911
4"	C811	4"	C911
4"	C821	4"	C921
6"	CA811		

OPERATOR DIS-ASSEMBLY

1. Unscrew (26) and remove indicator flag (6).
2. Remove the stem protector (18).
3. Remove bearing retainer nut (27).
4. Remove the handwheel (8) and key (11).
5. Unbolt and remove the housing cover (5).
6. Unbolt and remove the guide pin (9), with detent pin (10) and spring (13).
7. Pull the upper stem (2) with lower stem (4), roller (14), bearing (20) and indicator shaft (7) out through the top of the housing (1). If the bearing is snug in the housing, replace the handwheel and key. Turn the handwheel clockwise to raise the lower stem as far as possible. Insert a 3/8" diameter bar through the two holes in the bottom of the housing. Turn the handwheel clockwise and jack the bearing clear of the housing.
8. Remove the set-screw (16) and push the indicator shaft sub-assembly (7) out through the bottom of the lower stem.
9. Remove the lower stem (4) from the upper stem (2).
10. Remove the retaining ring (30) and bearing (20) from the upper stem.
11. Remove the O-Ring (16) from the inside of the housing, and grease seal (19) and bushing (12) (if req'd) from the top of the upper stem (2).

OPERATOR ASSEMBLY

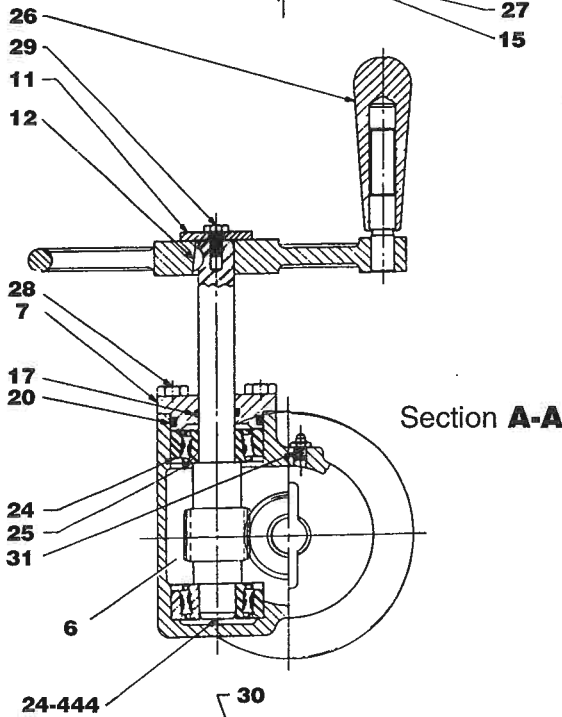
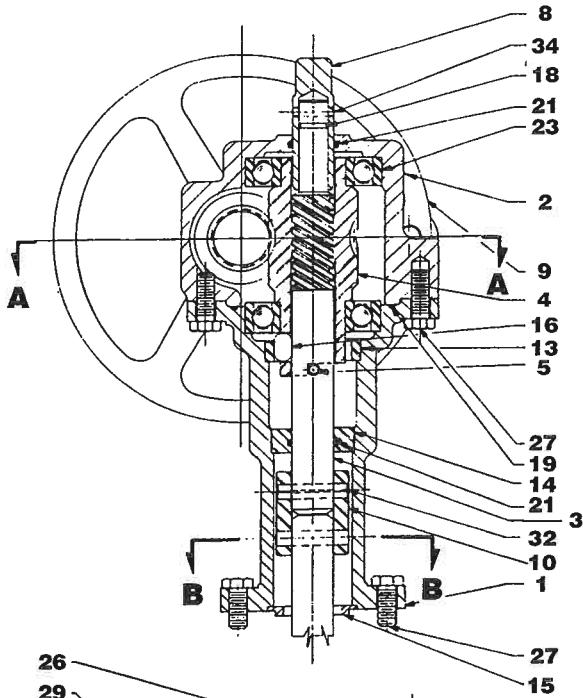
1. Place the bearing (20) on upper stem (2). Install a retaining ring (30) to lock bearing in place.
2. Apply a liberal coat of grease to all surfaces of upper stem (2) below the bearing, and to all surfaces of the lower stem (4). Thread the upper stem (2) into the lower stem (4) such that the drive pin (3) in the upper stem comes against the shoulder at the TOP of the lower stem and the detent recess in upper stem is exactly in line with the roller opening in lower stem. This operation may require several attempts as the threads are multiple start and do not always assemble correctly with the first try.
3. Install the indicator shaft assembly (7) up through both stems. Align the detent hole in the indicator disc with the threaded hole in the lower stem and fasten with set-screw (25). Set-screw must be below the outside surface of the lower stem.
4. Install O-Ring (16) in housing (1).
5. Place roller (14) in opening of lower stem. A liberal application of grease will hold it in position.
6. Place the stem assembly into the housing – taking care that roller is aligned with roller groove in housing. Push entire assembly down until bearing rest on shoulder in housing.
7. Apply a smooth even coating of Permatex Number 3D to surface of guide pin boss on housing (1).
8. Insert guide pin (14) with detent pin (10) and spring (13) to fully engage slot in lower stem and secure with cap screws (21).
9. Apply a smooth even coating of Permatex Number 3D to top surface of housing (1).
10. Install O-Ring (15) in housing cover (5) and secure to housing (1) with cap screws (22).
11. Install the handwheel (8) and key (11).
12. Install the bearing retainer nut (27) and tighten securely.
13. Install grease seal (19) and bushing (12) in top of upper stem (2).
14. Install stem protector (18).
15. Install indicator flag (6) and secure with screw (26).

* not available separately



TWIN SEAL™ MODEL 376G & 501G

Cross Section

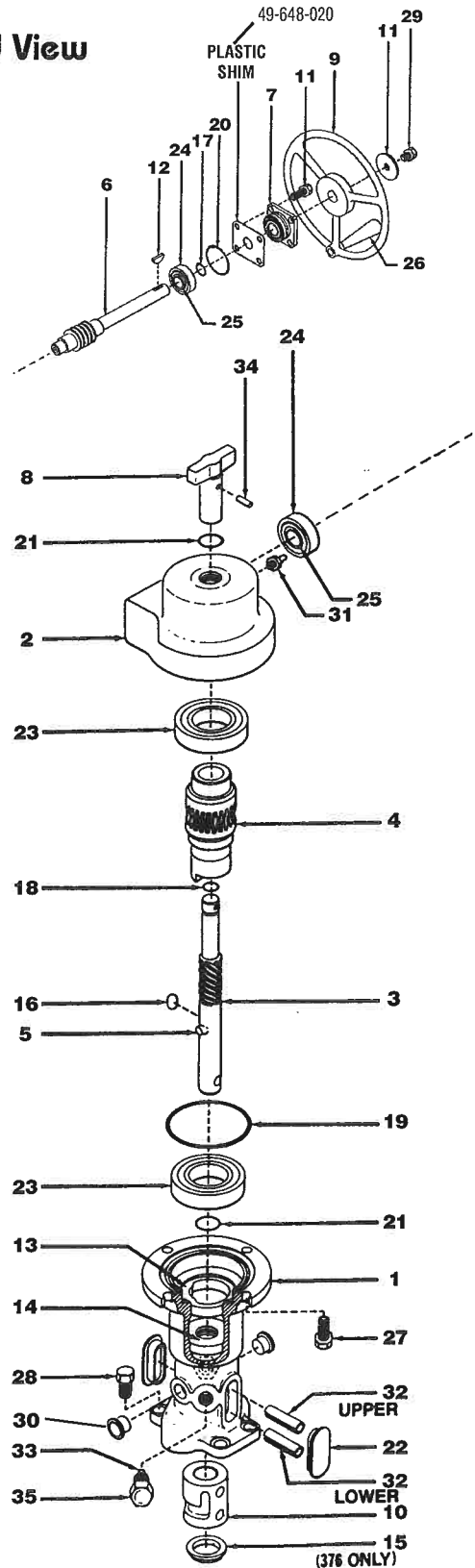


Section B-B

376 G Is Used on Models:

2"	C811	2"	C821
3"	CA811	3"	CA821

Exploded View



501 G Is Used on Models:

2"	C841	2"	C921
3"	C841	3"	C911
4"	C811	4"	C911
4"	C821	4"	C921
6"	CA811		



GENERAL VALVE COMPANY

OPERATOR DIS-ASSEMBLY

1. Remove the indicator pin (34) and pull the indicator stem (8) up through the gear housing (2).
2. Remove the stop screw (35) and dowel pin (33). Drive out the upper coupling pin (32) and remove the coupling (10).
3. Remove the cap screw (29), washer (11), handwheel (9) and key (12).
4. Remove the four cap screws (27) and the gear housing cover (7).
5. Remove four cap screws (27) and lift off the gear housing (2). It may be necessary to turn the worm shaft counterclockwise to back the worm clear of the gear while lifting off the gear housing. The worm shaft (6) and the tapered bearing cup (24) and cone (25) on each end may now be removed from the gear housing (2).
6. The operator stem (3), upper stem (4), bearings (23), and roller (16) may now be lifted out of the operator housing.

NOTE: The cam bushing (13) and stem bushing (14) are a press fit in the operator housing and should not be removed. Should the cam bushing require replacement, the operator housing must be returned to the factory.

Item No.	376G Part No.	501G Part No.	Description	Req'd
1	21-583	21-555	Operator Housing	1
2	21-584	21-554	Gear Housing	1
3	22-524	22-508	Operator Stem	1
4	23-560	23-525	Upper Stem	1
5	77-465	77-464	Pin*	1
6	24-451	24-445	Worm Shaft	1
7	26-632	26-580	Gear Housing Cover	1
8	27-545	27-504	Stem Indicator	1
9	28-441	28-442	Handwheel	1
10	32-476	32-469	Coupling	1
11	44-465	44-453	Handwheel Washer	1
12	45-431	45-431	Key	1
13	46-557	46-501	Cam Bushing	1
14	46-558	46-502	Stem Bushing	1
15	46-559	—	Pilot Bushing	1
16	48-405	48-401	Roller	1
17	62-71	62-34	O-Ring	1
18	62-83	62-70	O-Ring	1
19	62-398	62-79	O-Ring	1
20	62-91	62-91	O-Ring	1
21	62-371	62-339	O-Ring	2
22	—	64-424	Caplug	
23	66-483	66-476	Ball Bearing	2
24	66-481	66-477	Cup Bearing	2
25	66-482	66-478	Cone Bearing	2
26	69-414	69-414	Spinner Handle	1
27	72-5	72-5	Cap Screw	8
28	72-16	72-10	Cap Screw	4
29	72-21	72-26	Cap Screw	1
30	76-891	76-594	Plug	1
31	76-612	76-612	Lube Fitting	1
32	77-422	77-417	Coupling Pin	2
33	77-480	77-418	Dowel Pin	1
34	77-451	77-440	Indicator Pin	1
35	98-790	98-663	Stop Screw	1

OPERATOR ASSEMBLY

1. Install O-Ring (21) in the stem bushing (14) in the Operator Housing (1). Place bearing (23) in the top of the operator housing (1).
2. Apply a liberal coating of grease to all surfaces of the operator stem (3) and the upper stem (4). Thread the operator stem into the upper stem such that the dowel pin (5) comes against the shoulder at the BOTTOM of the upper stem and the detent recess in the operator stem is exactly in line with the roller opening at the bottom of the upper stem. This operation may require several attempts as the threads are multiple start and do not always assemble correctly with the first try.
3. Place the roller (16) in the opening of the upper stem (4) and the detent recess of the operator stem (3). An application of grease will hold it in position.
4. Position the operator housing such that when viewed from above, the raised portion of the cam is in the lower left quadrant of the housing bore (see cross-section illustration). With the roller on the left side, place the upper stem, operator stem and roller (which have been assembled together—see steps 2 & 3) into the operator housing (1), down through the stem bushing (14) and cam roller bushing (13) until the shoulder of the upper stem (4) is against the bearing (23).
5. Install bearing (23) in the gear housing (2). Install the O-Ring (21) in the top of the gear housing (2).
6. Install the tapered roller bearing cup (24) in the recess of the gear housing with the large diameter of the taper facing out.
7. Install tapered roller bearing cup (24) and cone (25) on the handwheel end of the worm shaft (6). Place bearing cone (25) on the opposite end of the worm shaft with the large diameter of the taper against the shaft shoulder. Apply a liberal amount of grease to all parts.
8. Install the worm shaft in the gear housing. Make certain that the rear bearing cone has properly entered the rear bearing cup.
9. Install O-Rings (17) and (20) in the gear housing cover (7) and assemble to the gear housing (2) with four of the cap screws (27). Run the screws in just enough to keep parts in place but do not tighten at this time.
10. Install O-Ring (19) in the top of the operator housing. Place the gear housing on the operator housing with the worm gear on the left side as viewed from the top (same side as the roller) and fasten with four of the cap screws (27).

NOTE: Worm shaft must be moved out slightly to allow parts to assemble. Tighten cap screws (27) in gear housing cover (7).

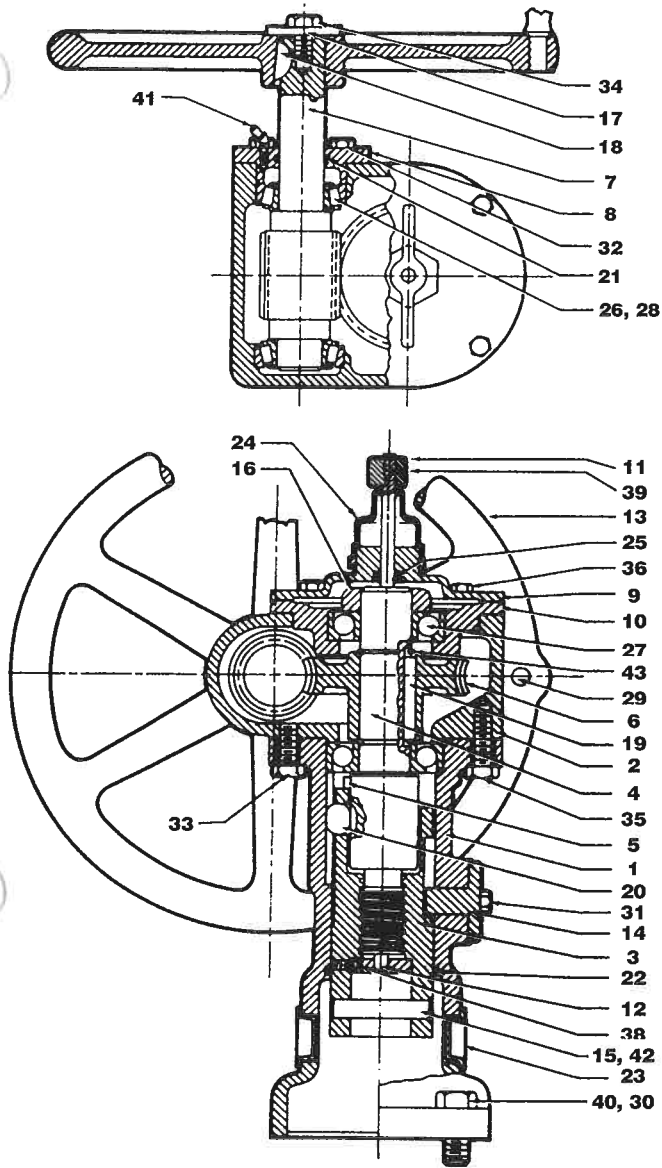
11. Assemble handwheel (9), key (12), washer (11) and cap screw (29) on the worm shaft.
 12. Place a drift punch through the hole in the top of the operator stem to prevent it from turning. With the punch at 90° to the worm shaft, turn the handwheel clockwise and run the upper stem down as far as it will go. Place the coupling (10) on the bottom of the operator stem with the horizontal portion of the L-shaped groove at the bottom. Turn the coupling until the coupling pin hole in the operator stem is aligned with the top hole in the coupling, and the vertical groove without the ramp is aligned with the stop screw boss in the housing. Drive the coupling (32) into the hole in the top of the coupling and the bottom hole of the operator stem. Install the stop screw (35) and the dowel pin (33).
- NOTE:** The coupling (10) has an L-shaped groove on both sides. The vertical portion of one of the grooves has a ramp at the top. The coupling must be installed such that the side without the ramp is adjacent to, and engages the stop screw. (The ramp is used to actuate the automatic body bleed valve when installed.)
13. Install O-Ring (21) in the top of the gear housing and O-Ring (18) in the top of the lower stem (3). Place the indicator stem (8) on the top of the operator stem and down through the gear housing. Install the indicator pin (34).

* not available separately



TWIN SEAL™ MODEL 625G, 751G & 755G

Cross Section



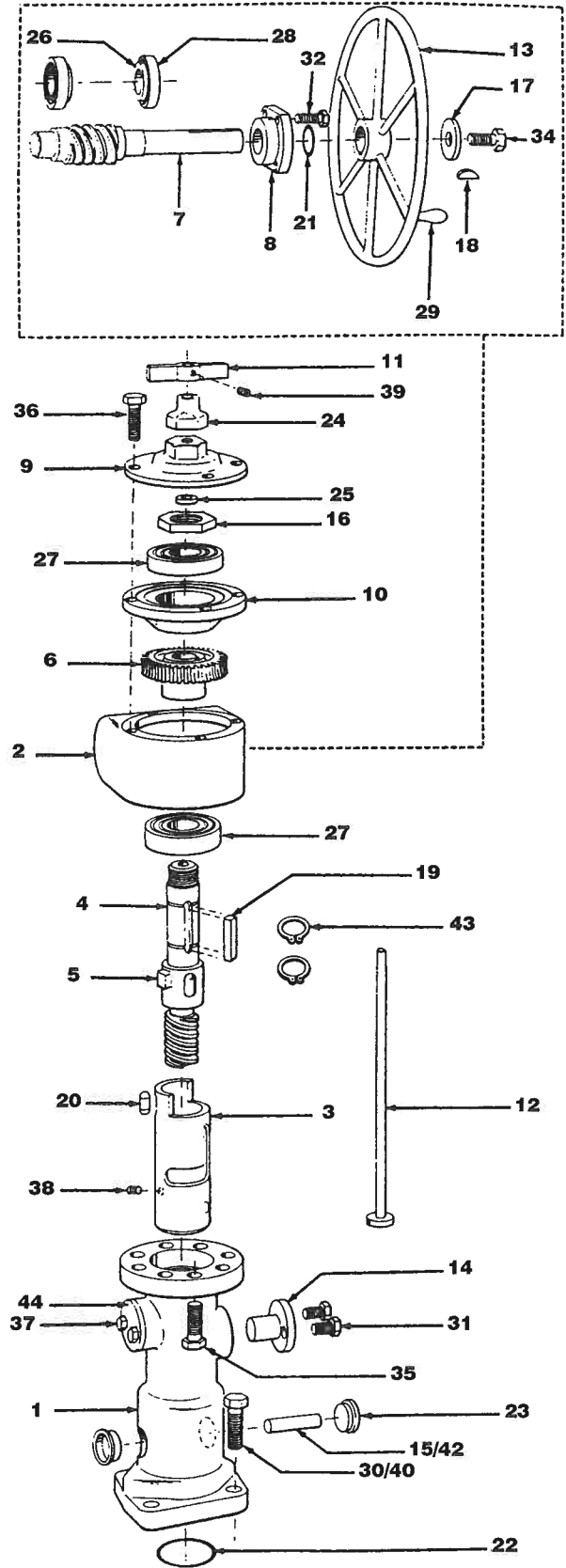
625 G Is Used on Models:

2"	C851	2"	C941
2"	C861	4"	C941
3"	C851	6"	C911
3"	C861	6"	C921
4"	C841		
4"	C851		
6"	C821		
8"	C811		
10"	CA811		

751 G Is Used on Models:

6"	C841	8"	C911
8"	C821	10"	C911
10"	C821		
12"	C811		
14"	C811		

Exploded View



755 G Is Used on Models:

6"	C851	6"	C941
8"	CA841		



TWIN SEAL™ MODEL 625G, 751G & 755G

OPERATOR DIS-ASSEMBLY

1. Unscrew (39) and remove indicator flag (11).
2. Remove Stem protector (24).
3. Unbolt and remove gear housing cover (9).
4. Remove bearing retainer nut (16).
5. Remove bearing carrier (10) and upper bearing (27).
6. Remove upper retaining ring (43).
7. Remove cap screw (34), washer (17), handwheel (13) and key (18).
8. Unbolt and remove bearing cap (8).
CAUTION: DO NOT DAMAGE PLASTIC SHIMS.
9. Screw out the worm shaft (7). Front bearing cone (26) and cup (28) and rear bearing cone (26) will come out with the worm shaft. Rear bearing cup (28) can then be removed from gear housing (2).
10. Remove the worm gear (6) and key (19).
11. Unbolt and remove the gear housing (2).
12. Unbolt and remove the guide pin (14).
13. Pull the upper stem (4) with lower stem (3), roller (20), lower bearing (27) and indicator shaft (12) out through the top of the housing (1). If the bearing is snug in the housing, install the worm gear with its key on the upper stem upside down (hub up). Turn the gear counter clockwise to raise the lower stem as far as possible. Insert a 1/2" diameter bar through the two holes in the bottom of the housing. Using a pipe wrench on the gear hub, turn clockwise and jack the bearing clear of the housing.
14. Remove the set-screw (38) and push the indicator shaft sub-assembly (12) out through the bottom of the lower stem.
15. Remove the lower stem (3) from the upper stem (4).
16. Remove the retaining ring (43) and lower bearing (27) from the upper stem.

OPERATOR ASSEMBLY

1. Place one of the two bearings (27) on upper stem (4).
NOTE: This bearing is assembled such that the wide surface of the inner race seats on the upper stem shoulder.
Install a retaining ring (43) to lock the bearing in place.
NOTE: The retaining ring comes against narrow surface of inner race.
2. Apply liberal coat of grease to all surfaces of the upper stem below the bearing. Thread the upper stem (4) into the lower stem (3) such that stop pin (5) in the upper stem comes against the shoulder at the TOP of the lower stem and the detent recess in upper stem is exactly in line with the roller opening in lower stem. This operation may require several attempts as the threads are multiple start and do not always assemble correctly with the first try.
3. Install the indicator shaft assembly (12) up through both stems. Align the detent hole in the indicator disc with the threaded hole in the lower stem and fasten with set-screw (38). Set-screw must be below the outside surface of the lower stem.
4. Install O-Ring (22) in housing (1).
5. Place roller (20) in opening of lower stem. A liberal application of grease will hold it in position.
6. Place the stem assembly into the housing—taking care that roller is aligned with roller groove in housing. Push entire assembly down until bearing rests on shoulder in housing.
7. Apply a smooth even coating of Permatex Form-a-Gasket to surface of guide pin boss on housing (1).
8. Insert guide pin (14) to full engage slot in lower stem and secure with cap screws (31).
9. Place gear key (19) in key way of upper stem.
10. Install tapered roller bearing cup (28) in rear bearing recess of gear housing (2) with large diameter of taper facing out.
11. Install tapered roller bearing cup (28) and cone (26) on handwheel end of worm shaft (7). Place bearing cone (26) on opposite end with large diameter of taper against shaft shoulder.
12. Install worm shaft in gear housing. Make certain that rear bearing cone has properly entered rear bearing cup (28).
13. Install O-Ring (21) in bearing cap (8).
14. Apply a smooth even coating of Permatex Number 3D to bearing cover boss on gear housing. Fasten bearing cap (8) in place with cap-screws (32). Be sure to install the plastic shims between gear housing and bearing cap.
15. Install worm gear (6) in gear housing with hub down. (Toward smaller opening).
16. Apply Form-A-Gasket to top flange of operator housing (1). Place gear housing (2) with assembled parts on top of operator housing guiding worm gear keyway over key (19) in upper stem (3).
17. Install retaining ring (43) to secure worm gear (6).
18. Fasten gear housing (2) to operator housing (1) with cap screws (35). **CAUTION: NOTE THAT THE SHORT CAP SCREW (33) IS INSTALLED DIRECTLY UNDER THE CENTER OF THE WORM SHAFT (7).**
19. Fill gear housing (2) with grease up to top of worm gear.

20. Install bearing (27) in bearing carrier (10). **NOTE:** The widest surface of the outer race goes against the shoulder in the bearing carrier.
21. Apply a smooth even coating of Form-A-Gasket over top surface of gear housing (2).
22. Place bearing carrier (10) on top of gear housing (2). Install two cap screws (36) 180° apart to temporarily align the bearing carrier. They need only be partially screwed in.
23. Install lock nut (16) on upper stem and tighten snug with a wrench. Remove the two cap screws (36).
24. Install the grease seal (25) in the gear housing cover (9). Slide the cover over the indicator shaft (12) and secure to top of gear housing (2) with cap screws(36).
25. Install stem protector (24).
26. Install indicator (11) and secure with socket head cap screw (39).

Item No.	625 G Part No.	751 G Part No.	755 G Part No.	Description
1	21-422	21-623	21-623	Housing Operator
2	21-408	21-405	21-443	HSG Gear
3	22-440	22-555	22-555	Stem Lower
4	22-439	22-554	22-554	Stem Upper
5	41-406	41-401	41-401	Pin Drive *
6	23-402	23-403	23-406	Gear Worm
7	24-404	24-404	24-403	Shaft Worm
8	26-401	26-401	26-401	Cap Bearing
9	26-413	26-403	26-403	Cover Gear Housing
10	26-412	26-411	26-423	Carrier Bearing
11	27-406	27-406	27-406	Indicator Flag
12	27-429	27-435	27-435	Indicator Shaft
13	28-404	28-402	28-402	Handwheel
14	41-407	41-498	41-498	Pin Guide
15	77-403	41-410	41-410	Pin Coupling
16	75-462	42-401	42-401	Nut Hex
17	44-401	44-401	44-401	Washer
18	45-402	45-402	45-402	Key Woodruff
19	45-403	45-406	45-406	Key Straight
20	48-403	48-413	48-413	Roller
21	62-13	62-13	62-13	O-Ring
22	62-22	62-209	62-209	O-Ring
23	64-405	64-402	64-402	Plastic Plug
24	64-411	64-411	64-411	Protector
25	65-401	65-401	65-401	Seal Grease
26	66-401	66-401	66-401	Bearing Cone
27	66-412	66-410	66-410	Bearing Ball
28	66-458	66-458	66-458	Bearing Cup
29	69-414	69-414	69-414	Handle Spinner
30	72-11	—	—	Stud
31	72-4	72-4	72-4	Screw Cap
32	72-5	72-5	72-5	Screw Cap
33	72-10	72-6	—	Screw Cap
34	72-8	72-8	72-8	Screw Cap
35	72-9	72-9	72-9	Screw Cap
36	72-14	72-14	72-26	Screw Cap
37	72-21	72-21	72-21	Screw Cap
38	74-3	74-4	73-28	Screw Set
39	74-6	74-6	74-6	Screw
40	—	73-130	73-130	Nut Hex
41	76-612	76-612	76-612	Fitting Lube
42	—	78-406	78-406	Ring Retaining
43	78-404	78-408	78-408	Ring Retaining
44	93-413	93-413	93-413	Cover

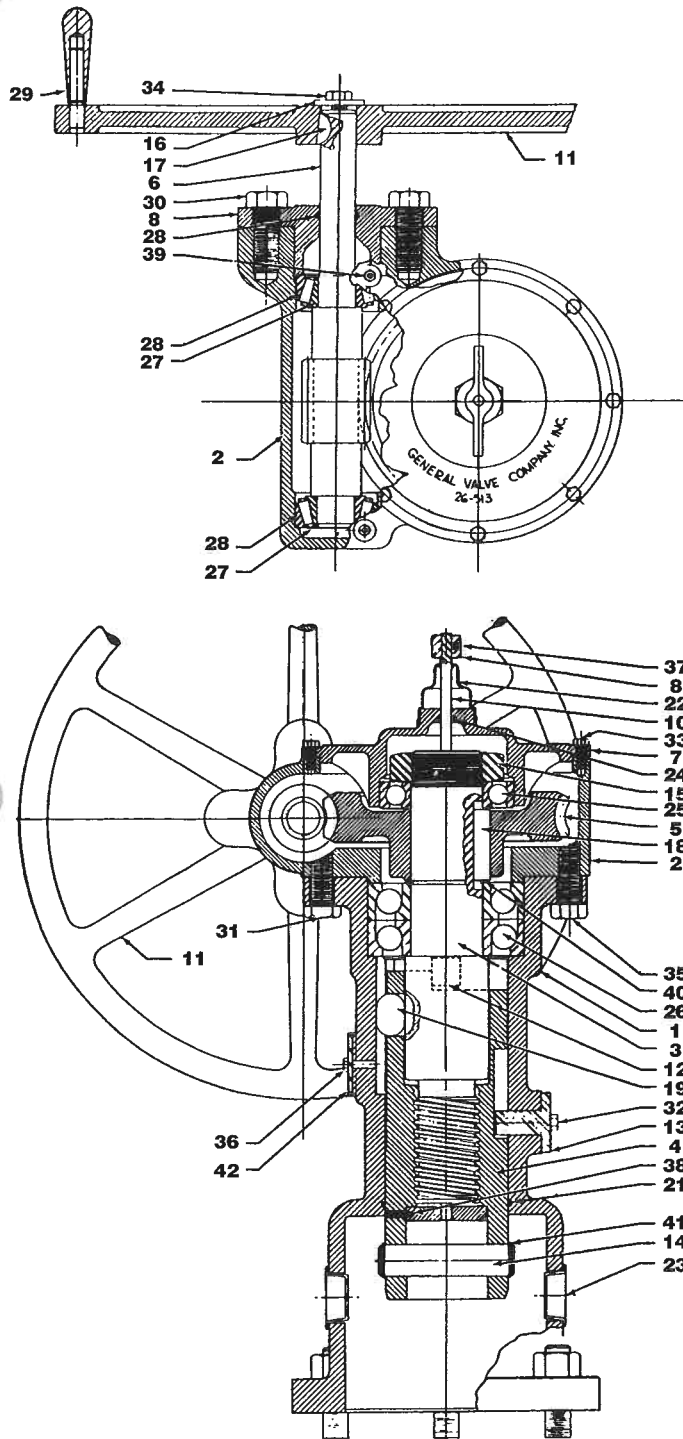
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GENERAL VALVE COMPANY

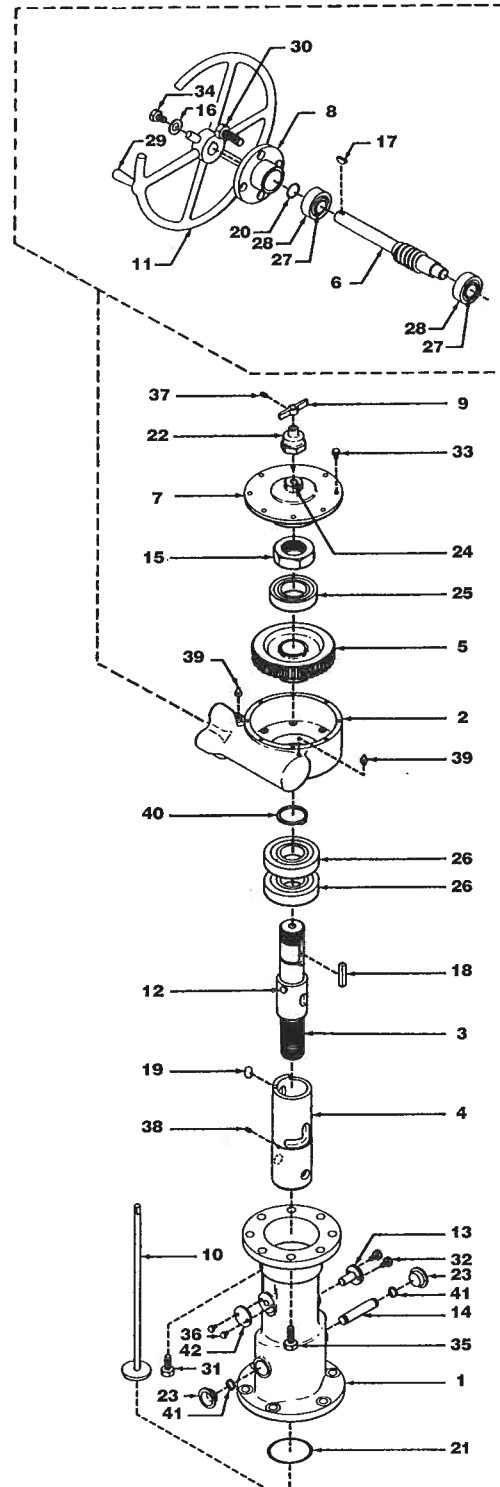


TWIN SEAL™ MODEL 1261G & 1261-7G

Cross Section



Exploded View



1261 G Is Used on Models:			
12"	C821	8"	C921
14"	C821	10"	CA921
16"	C811	12"	CA911
18"	C811	14"	C911
20"	CA811	16"	C911

43 NOT SHOWN

1261-7G Is Used on Models:			
8"	C851	12"	CA921
10"	CB841	18"	C911
12"	CB841	20"	CA911
16"	CA821		
18"	CA821		
24"	CA811		

OPERATOR DIS-ASSEMBLY

1. Unscrew (37) and remove indicator flag (9).
2. Remove indicator shaft protector (22).
3. Unbolt and remove gear housing cover (7).
4. Remove upper stem nut (15).
5. Remove upper bearing (25).
6. Remove cap screw (34), handwheel washer (16), handwheel (11) and woodruff key (17).
7. Unbolt and remove bearing cap (8). **CAUTION: DO NOT DAMAGE PLASTIC SHIMS.**
8. Screw out worm shaft (6). Front bearing cone (27) and cup (28) and rear bearing cone (27) will come out with the worm shaft. Rear bearing cup (28) can then be removed from gear housing.
9. Remove the worm gear (5) and key (18).
10. Unbolt and remove the gear housing (2).
11. Remove the retaining ring (40).
12. Unbolt and remove the guide pin (13).
13. Pull the upper stem (3) with the lower stem (4), roller (19), two bearings (26) and indicator shaft (10) out through the top of the housing (1). If the bearings are snug in the housing, install the worm gear (5) with its key (18) on the upper stem upside down (hub up). Turn the gear counter-clockwise to raise the lower stem as far as possible. Insert a 1½" diameter bar through the two holes in the bottom of the housing. Using a pipe wrench on the gear hub, turn clockwise and jack the bearing clear of the housing.
14. Remove the socket head cap screw (38) and push the indicator shaft sub-assembly (10) out through the bottom on the lower stem (4).
15. Remove the lower stem (4) from the upper stem (3).
16. Remove the bearings (26) from the upper stem (3).

OPERATOR ASSEMBLY

1. Install the two bearings (26) at top of upper stem (3). **NOTE:** These are radial thrust bearings and must be installed such that the widest surfaces of the inner raceways are back to back. **INCORRECT INSTALLATION WILL RESULT IN SERIOUS DAMAGE.**
2. Install the bearing retaining ring (40).
3. Apply a liberal coating of grease to all surfaces of the upper stem (3).
4. Thread the upper stem (3) into the lower stem (4) such that the drive pin in the upper stem comes against the shoulder at the TOP of the lower stem and the detent recess in the upper stem is exactly in line with the roller opening in the lower stem. This operation may require several attempts as the threads are multiple start.
5. Install the indicator shaft sub-assembly (10) up through both stems.
6. Install O-ring (21) in housing (1).
7. Place the roller (48) in the side opening of the lower stem (4).
8. Place the stem assembly into the housing (1) taking care that the roller (48) is aligned with the roller groove in the housing. Push the assembly down until the lower bearing (26) rests on the shoulder in the housing.
9. Apply a smooth even coating of Permatex Form-A-Gasket to the surface of the guide pin boss on the housing (1).
10. Insert the guide pin (13) to full engage the slot in the lower stem (4) and fasten with cap screws (32).
11. Place gear key (18) in keyway of upper stem (3).
12. Install tapered roller bearing cup (28) in rear bearing recess of gear housing (2) with large diameter of taper facing out.
13. Install tapered roller bearing cup (28) and cone (27) on handwheel end of worm shaft (6).
14. Install worm shaft (6) in gear housing (2). Make certain that rear bearing cone (27) has properly entered the rear bearing cup (28).
15. Install O-ring (20) in bearing cap (8).
16. Apply a smooth coating of Permatex Form-A-Gasket to bearing cap boss on gear housing (2). Fasten bearing cap in place with cap screws (30). Be sure to install the plastic shims between the gear housing and the bearing cap.
17. Install worm gear (6) in gear housing (2) hub down (toward smallest opening).
18. Place the gear housing (2) with assembled parts on top of the operator housing guiding the worm gear keyway over key (18) in upper stem (3).

19. Install the ball bearing (25) on the upper stem (3) and secure with nut (15).
20. Apply a smooth coating of Permatex Form-A-Gasket to top of operator housing.
21. Fasten the gear housing (2) to the operator housing with cap screws (35 and 3). **CAUTION: NOTE THAT THE SHORT CAP SCREW (72B) IS INSTALLED DIRECTLY UNDER THE CENTER OF THE WORM.**
22. Fill the gear housing (2) with grease up to the top of the worm gear (5).
23. Apply a smooth coating of Permatex Form-A-Gasket to top surface of gear housing (2).
24. Install grease seal (24) in gear housing cover (7). Slide cover over indicator shaft (10) and ball bearing (25) and secure to top of operator housing with cap screws (33).
25. Install the indicator shaft protector (22).
26. Install the indicator flag (9) and secure with screw (37).
27. Install handwheel (11) with woodruff key (17), washer (16) and cap screw (34).

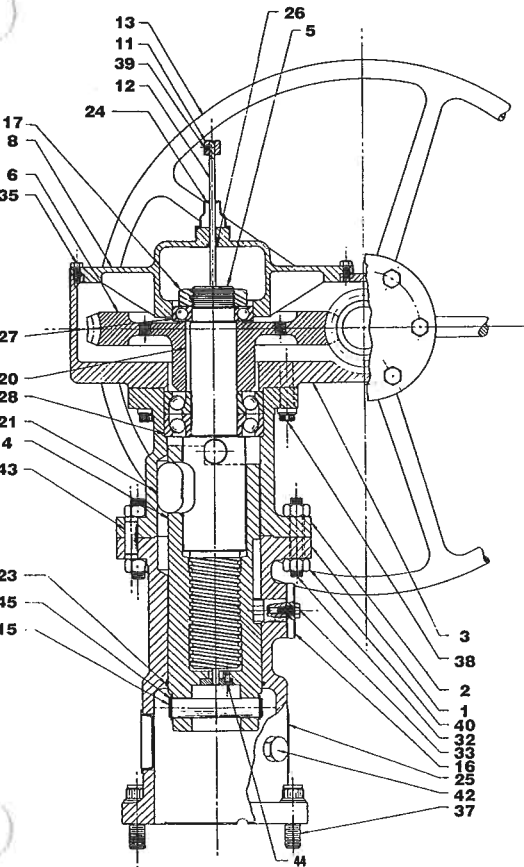
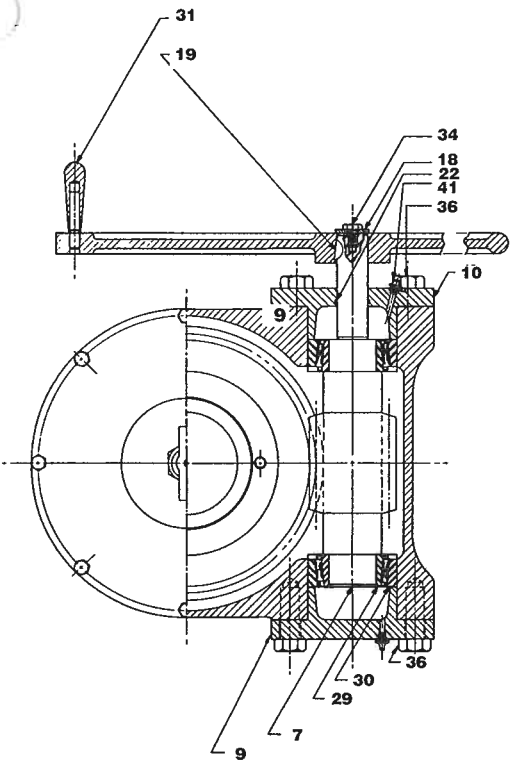
Item No.	1261 G Part No.	1261 7G Part No.	Description	Item No.
1	21-621	21-621	Operator Housing	1
2	21-518	21-518	Gear Housing	1
3	22-552	22-552	Upper Stem	1
4	22-553	22-553	Lower Stem	1
5	23-472	23-472	Worm Gear	1
6	24-428	24-428	Worm Shaft	1
7	26-513	26-513	Gear Housing Cover	1
8	26-514	26-514	Bearing Cap	1
9	27-406	27-406	Indicator Flag	1
10	27-488	27-488	Indicator Shaft	1
11	28-402	28-402	Handwheel	1
12	41-402	41-402	Drive Pin*	1
13	41-496	41-496	Guide Pin	1
14	41-411	41-411	Coupling Pin	1
15	42-403	42-403	Nut	1
16	44-401	44-401	Handwheel Washer	1
17	45-402	45-402	Woodruff Key	1
18	45-404	45-404	Key	1
19	48-412	48-412	Roller	1
20	62-13	62-13	O-Ring	1
21	62-208	62-208	O-Ring	1
22	64-411	64-411	Protector	1
23	64-416	64-416	Plastic Plug	21
24	65-401	65-401	Grease Seal	1
25	66-404	66-404	Ball Bearing	2
26	66-411	66-411	Ball Bearing	2
27	66-465	66-465	Bearing Cone	2
28	66-466	66-466	Bearing Cup	1
29	69-414	69-414	Spinner Handle	4
30	72-2	72-2	Cap Screw	1
31	72-3	72-3	Cap Screw	2
32	72-4	72-4	Cap Screw	8
33	72-7	72-7	Cap Screw	1
34	72-8	72-8	Cap Screw	7
35	72-13	72-13	Cap Screw	2
36	72-21	72-21	Cap Screw	1
37	73-28	74-6	Screw	1
38	73-28	74-12	Set Screw	2
39	76-412	76-412	Lube Fitting	1
40	78-405	78-405	Retaining Ring	2
41	78-407	78-407	Retaining Ring	1
42	93-413	93-413	Cover	1
43	—	26-712	Adapter	1

* not available separately

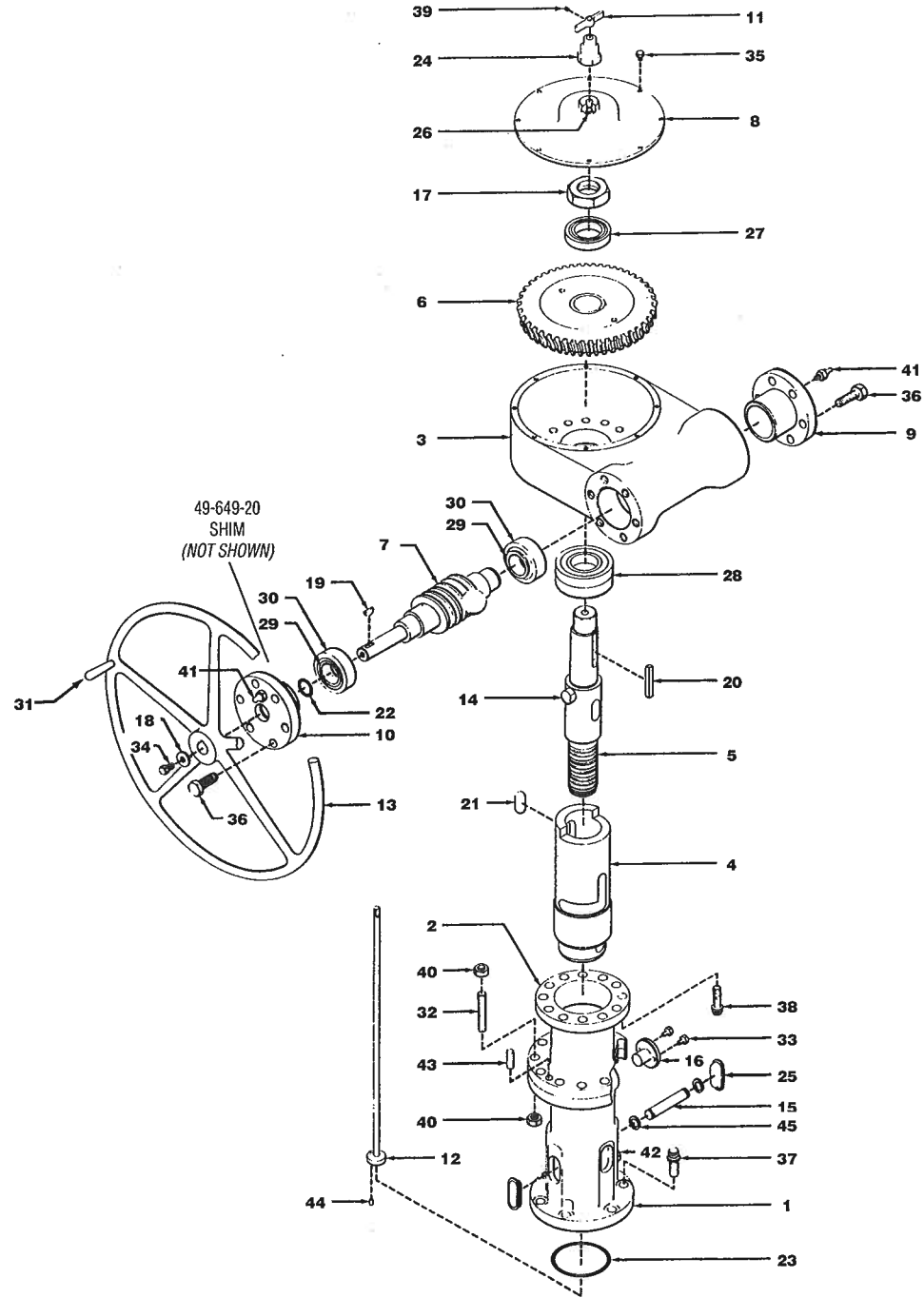


TWIN SEAL™ MODEL 1276G

Cross Section



Exploded View



1276 G Is Used on Models:

10"	C851	16"	C921
16"	CA841	20"	CB921
20"	CA821		
24"	CA821		
30"	CC811		

OPERATOR DISASSEMBLY

1. Turn handwheel counter clockwise to full open position.
2. Remove set-screw (39) and indicator flag (11).
3. Remove the stem protector (24).
4. Unbolt and remove the gear housing cover (8).
5. Remove the bearing retainer nut (17) and ball bearing (27).
6. Remove cap screw (34), washer (18), handwheel (13) and key (19).
7. Unbolt and remove the bearing caps (9) and (10). **CAUTION: DO NOT DAMAGE THE PLASTIC SHIMS UNDER FRONT BEARING CAP (10).**
8. Remove worm shaft (7) and taper bearings consisting of cone (29) and cup (30).
9. Remove worm gear (6) and key (20).
10. Unbolt and remove the gear housing (3).
11. Unbolt and remove the guide pin (16).
12. Pull the upper stem (5) and lower stem (4) with bearings (28) and roller (21) out through the top of the upper housing (2). If bearings are snug in the upper housing, remove the upper and lower stems with the roller through the bottom of the lower housing (1). Unbolt the upper and lower housing and remove the bearings with a suitable puller.
13. Separate the upper and lower stems and remove indicator shaft assembly (12).

OPERATOR ASSEMBLY

1. Install the two bearings (28) at the top end of the upper stem (5). **NOTE:** These are radial thrust bearings and must be installed such that the widest surfaces of the inner race ways are back to back. **INCORRECT INSTALLATION WILL RESULT IN SERIOUS DAMAGE.**
2. Apply a smooth even coating of Permatex Number 3D to the bottom flange of the upper housing (2) and fasten to the lower housing (1) with studs (32) and nuts (40). The dowel pin (43) is a press fit in the lower housing and a slip fit in the upper housing. Its function is to properly align the roller grooves.
3. Apply a liberal coating of grease to all surfaces of upper stem (5) and lower stem (4).
4. Thread the two stems together such that the drive pin (14) in the upper stem comes against the shoulder at the top of the lower stem and the detent recess in the upper stem is exactly in line with the roller opening in the lower stem. This operation may require several attempts as the threads are multiple start and do not always assemble correctly with the first try.
5. Install the indicator shaft sub-assembly up through both stems and secure with the roll pin (44) in the bottom of the lower stem.
6. Install O-ring (23) in the lower housing (1).
7. Place the roller (21) in the side opening of the lower stem (4). A liberal application of grease will hold it in place.
8. Place the stems with bearings and roller assembled down through the top of the upper housing until the lower of the two bearings (28) rests on the shoulder in the upper housing.
9. Apply a smooth even coating of Permatex Form-a-Gasket to the surface of the guide pin boss on the lower housing (1).
10. Insert the guide pin (16) to fully engage the slot in the lower stem and fasten with cap screws (33).
11. Place the gear key (20) in the keyway of the upper stem (5).
12. Place the tapered roller bearing cones (29) on each end of the worm shaft (7) with the large diameter of the cone taper against each shaft shoulder.
13. Assemble the cups (30) on the cones (29).
14. Apply a smooth even coating of Permatex Number 3D to the surfaces of the bearing retainer bosses on the gear housing (3).
15. Fasten the blind bearing cap (9) in place with cap screws (36).
16. Install the worm shaft (7) in the gear housing.
17. Install the O-Ring (22) in the bearing cap (10) and fasten in place with cap screws (36). Be sure to re-install the plastic shims between the gear housing and the bearing cap.
18. Install worm gear (6) in gear housing with hub down. (Toward smallest opening).
19. Apply a smooth coating of Permatex Number 3D to top flange of upper housing.
20. Place the gear housing with assembled parts on top of the upper housing guiding the worm gear keyway over the key (20) in the upper stem, and fasten to the upper housing with cap screws (38).
21. Install ball bearing (27) over upper stem and secure with nut (17).

22. Fill the gear housing with grease up to the top of the worm gear.
23. Apply a smooth even coating of Permatex Number 3D around top surface of gear housing.
24. Install the grease seal (26) in the gear housing cover (8). Slide the cover over the indicator shaft (12) and the ball bearing (27) and secure to the top of the operator housing with cap screws (35).
25. Install the stem protector (24) and secure the indicator flag (11) in place with set screw (39).
26. Install the handwheel (13) with key (19), washer (18), cap screw (34) and spinner handle (31).

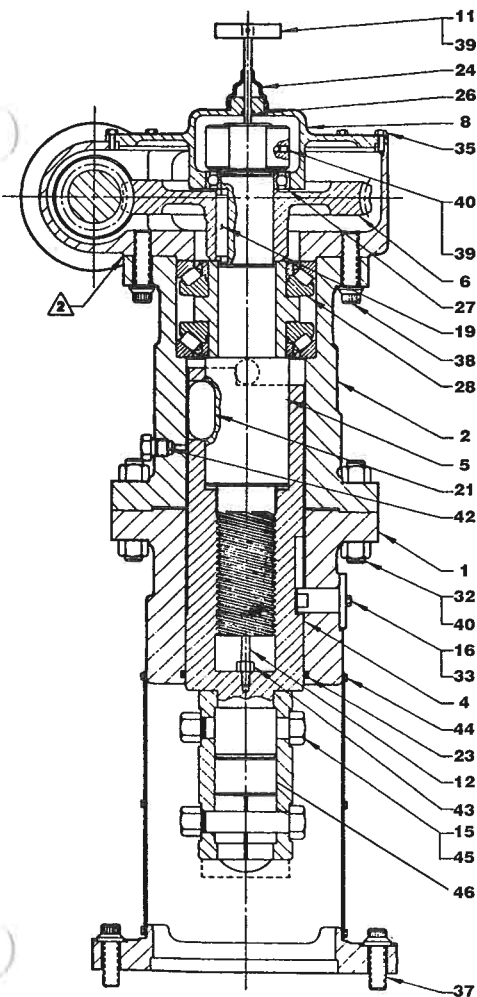
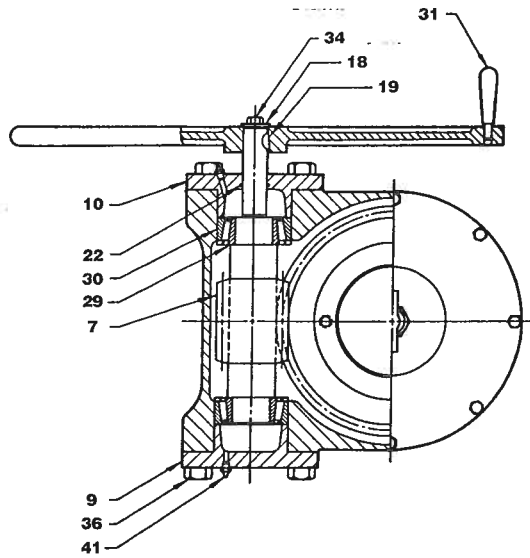
Item No.	1276 G Part No.	Description	Req'd
1	21-594	Lower Housing	1
2	21-595	Upper Housing	1
3	21-505	Gear Housing	1
4	22-533	Lower Stem	1
5	22-534	Upper Stem	1
6	23-461	Worm Gear	1
7	24-425	Worm Shaft	1
8	26-487	Gear Housing Cover	1
9	26-488	Bearing Cap	1
10	26-489	Bearing Cap	1
11	27-406	Indicator Flag	1
12	27-541	Indicator Shaft	1
13	28-432	Handwheel	1
14	41-473	Drive Pin*	1
15	41-476	Coupling Pin	1
16	41-480	Guide Pin	1
17	42-403	Nut	1
18	44-401	Washer	1
19	45-402	Key	1
20	45-428	Key	1
21	48-409	Roller	1
22	62-20	O-Ring	1
23	62-215	O-Ring	1
24	64-412	Protector	1
25	64-416	Plastic Plug	4
26	65-401	Grease Seal	1
27	66-404	Ball Bearing	1
28	66-452	Ball Bearing	2
29	66-454	Bearing Cone	2
30	66-463	Bearing Cup	2
31	69-414	Spinner Handle	1
32	71-47	Stud	12
33	72-5	Cap Screw	2
34	72-8	Cap Screw	1
35	72-26	Cap Screw	8
36	72-64	Cap Screw	12
37	73-111	Cap Screw	6
38	73-131	Cap Screw	12
39	74-6	Screw	1
40	75-406	Nut	24
41	76-412	Lube Fitting	2
42	76-536	Pipe Plug	1
43	77-454	Dowel Pin	1
44	77-481	Rollpin	1
45	78-407	Retaining Ring	2

* not available separately



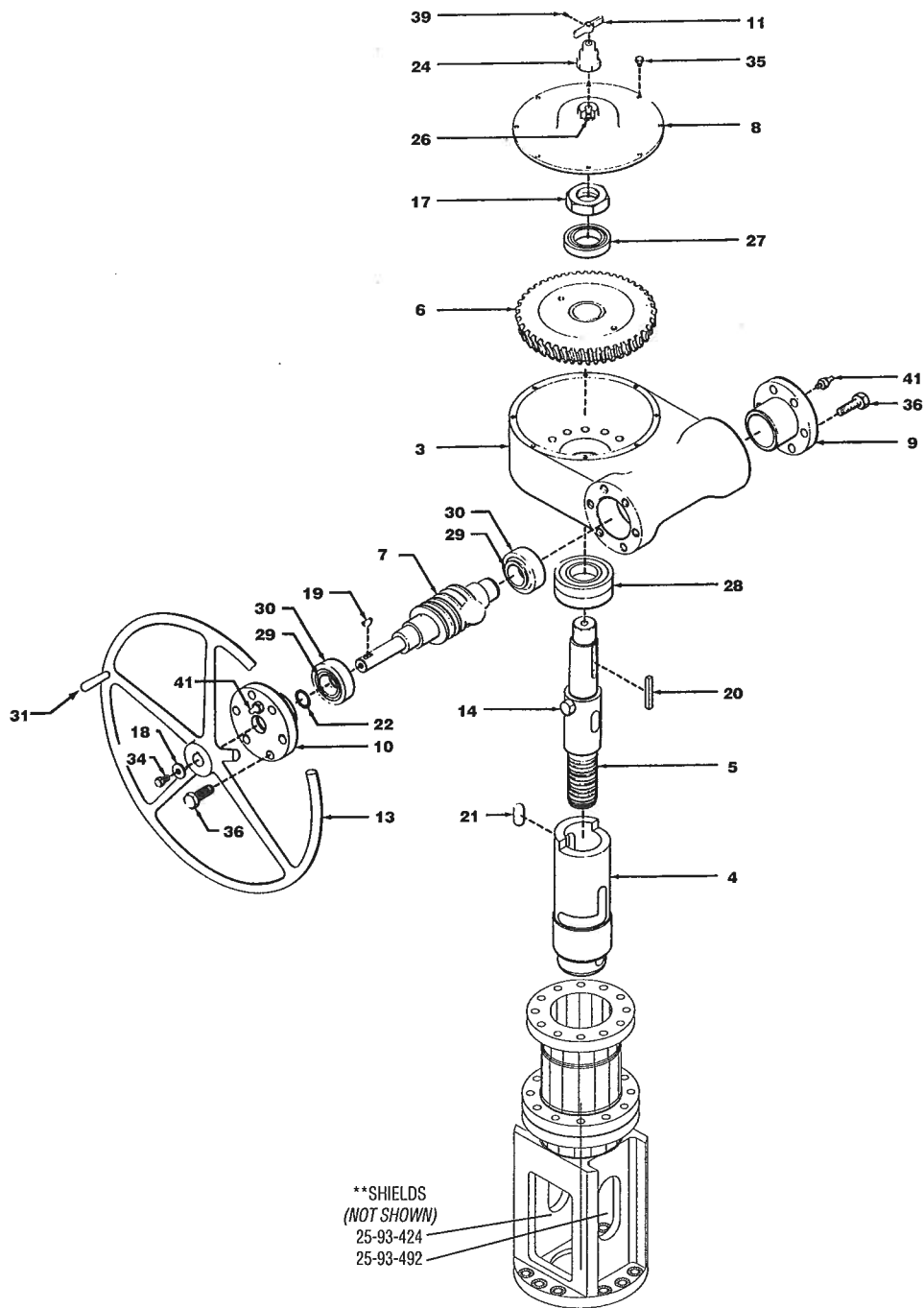
TWIN SEAL™ MODEL 1500 G

Cross Section



Handwheel not shown

Exploded View



**SHIELDS
(NOT SHOWN)
25-93-424
25-93-492

1500 G Is Used on Models:

20"	C841	16"	C941
30"	CC821		
36"	CA811		



GENERAL VALVE COMPANY

OPERATOR DISASSEMBLY

1. Turn worm shaft counter-clockwise to full open position. Remove set screw (39) and indicator flag (11). Remove the stem protector (24).
4. Unbolt and remove the gear housing cover (8).
5. Remove the set screw (39), and upper stem nut (17).
6. Remove the ball bearing (27).
7. Unbolt and remove bearing cap (10). CAUTION: DO NOT DAMAGE THE PLASTIC SHIMS UNDER MOTOR ADAPTER.
8. Remove the worm shaft (7) and taper bearings consisting of cones (29) and cups (30).
9. Remove worm gear (6) and key (20).
10. Unbolt and remove the gear housing (3).
11. Unbolt and remove the guide pin (16).
12. Pull the upper stem (5) and lower stem (4) with bearings (28), bearing retainer and roller (21) out through the top of the upper housing (2). If bearings are snug in the upper housing, remove the upper and lower stems with the roller through the bottom of the lower housing. Unbolt the upper and lower housings and remove the bearings with a suitable puller.
13. Separate the upper and lower stems and remove the nut (43) and indicator shaft (12).

OPERATOR ASSEMBLY

1. Install the two bearings (28) and bearing retainer at the top end of the upper stem (5). NOTE: These are radial thrust bearings and must be installed such that the widest surfaces of the inner raceways are back to back. INCORRECT INSTALLATION WILL RESULT IN SERIOUS DAMAGE.
2. Apply a smooth even coating of Form-A-Gasket to the bottom flange of the upper housing (2) and fasten to the lower housing (1) with studs (32) and nuts (40).
3. Apply a liberal coating of grease to all surfaces of the upper stem (5) and lower stem (4).
Thread the two stems together such that the drive pin in the upper stem comes against the shoulder at the top of the lower stem and the detent recess in the upper stem is exactly in line with the roller opening in the lower stem. This operation may require several attempts as the threads are multiple start and do not always assemble correctly with the first try.
5. Install the indicator shaft (12) up through both stems and secure with nut (43) in the bottom of the lower stem.
6. Install O-ring (23) in the lower housing.
7. Place the roller (21) in the side opening of the lower stem (4). A liberal application of grease will hold it in place.
8. Place the stems with bearings (28), bearing retainer and roller (21) assembled down through the top of the upper housing until the lower of the two bearings rests on the shoulder in the upper housing.
9. Apply a smooth even coating of Form-A-Gasket to the surface of the guide pin boss on the lower housing.
10. Insert the guide pin (16) to fully engage the slot in the lower stem and fasten with cap screws (33).
11. Place the gear key (20) in the keyway of the upper stem.
12. Place the tapered roller bearing cones (29) on each end of the worm shaft (7) with the large diameter of the cone taper against each shaft shoulder.
13. Assemble the cups (30) on the cones.
14. Install the worm shaft in the gear housing.
15. Apply a smooth even coating of Form-A-Gasket to motor adapter mounting surface of the gear housing.
16. Install o-ring (22) in the bearing cap (10) and fasten to gear housing with screws (36). Be sure to re-install the plastic shims between the gear housing and motor adapter.
17. Install worm gear (6) in gear housing with hub down (toward smaller opening).
3. Apply a smooth even coating of Form-A-Gasket to the top flange of the upper housing.
19. Place the gear housing with assembled parts on top of the upper housing guiding the worm gear keyway over the key (20) in the upper stem and fasten to the upper housing with cap screws (38).

20. Install ball bearing (27) over upper stem and secure with upper stem nut.
21. Install insert and set screw into upper stem nut.
22. Fill the gear housing with grease up to the top of the worm gear.
23. Apply a smooth even coating of Form-A-Gasket around top surface of the gear housing.
24. Install the grease seal (26) in the gear housing cover (8). Slide the cover over the indicator shaft (12) and ball bearing (27) and secure to the top of the gear housing with cap screws (35).
25. Install stem protector (24) and secure indicator flag (11) in place with set screw (39).

Item No.	1500 G Part No.	Description	Req'd
1	21-572	Lower Housing	1
2	21-571	Upper Housing	1
3	21-573	Gear Housing	1
4	22-510	Lower Stem	1
5	22-509	Upper Stem	1
6	23-411	Worm Gear	1
7	24-425	Worm Shaft	1
8	26-515	Gear Housing Cover	1
9	26-488	Bearing Cap	1
10	26-489	Bearing Cap	1
11	27-406	Indicator Flag	1
12	27-450	Indicator Shaft	1
13	28-432	Handwheel	1
14	41-474	Drive Pin*	1
15	32-410	Coupling Pin	1
16	41-474	Guide Pin	1
17	75-441	Nut	1
18	44-401	Washer	1
19	45-402	Key	1
20	45-414	Key	1
21	48-408	Roller	1
22	62-20	O-Ring	1
23	62-89	O-Ring	1
24	64-412	Protector	1
25	**	Oper. Shield	2
26	65-401	Grease Seal	1
27	66-424	Ball Bearing	1
28	66-425	Ball Bearing	1
29	66-454	Bearing Cone	2
30	66-463	Bearing Cup	2
31	69-414	Spinner Handle	1
32	71-109	Stud	12
33	72-5	Cap Screw	2
34	72-8	Cap Screw	1
35	72-26	Cap Screw	8
36	72-64	Cap Screw	12
37	73-87	Cap Screw	12
38	73-124	Cap Screw	12
39	74-6	Screw	1
40	75-408	Nut	24
41	76-412	Lube Fitting	2
42	76-470	Pipe Plug	1
43	75-441	Nut	1
44	72-21	Capscrew	30
45	75-442	Coupling Pin Nut	2
46	32-452	Spacer	1

* not available separately



UNDERSTANDING THE DTR BLEED SYSTEM

SCOPE

This specification addresses the proper functioning, trouble shooting, and repair of the General Twin Seal differential (pressure) thermal relief (DTR) bleed system.

BACKGROUND

When the General Twin Seal valve is seated and completely filled with a liquid, any slight variation in temperature due to the sun's rays or ambient thermal fluctuations will cause drastic changes in body cavity pressure resulting from thermal expansion.

While results vary under actual service conditions depending on media, pressure vessel rigidity, and presence of entrained gas it is known that dangerously high pressures will build up in liquid filled positive shut off valves.

Valves filled with 330 API fuel oil have exhibited a 75 PSI increase in pressure with a temperature rise of only 1° F. Putting this into perspective, a normal daily 30°F swing in ambient temperature may cause an increase of body cavity pressure of 2250 PSI.

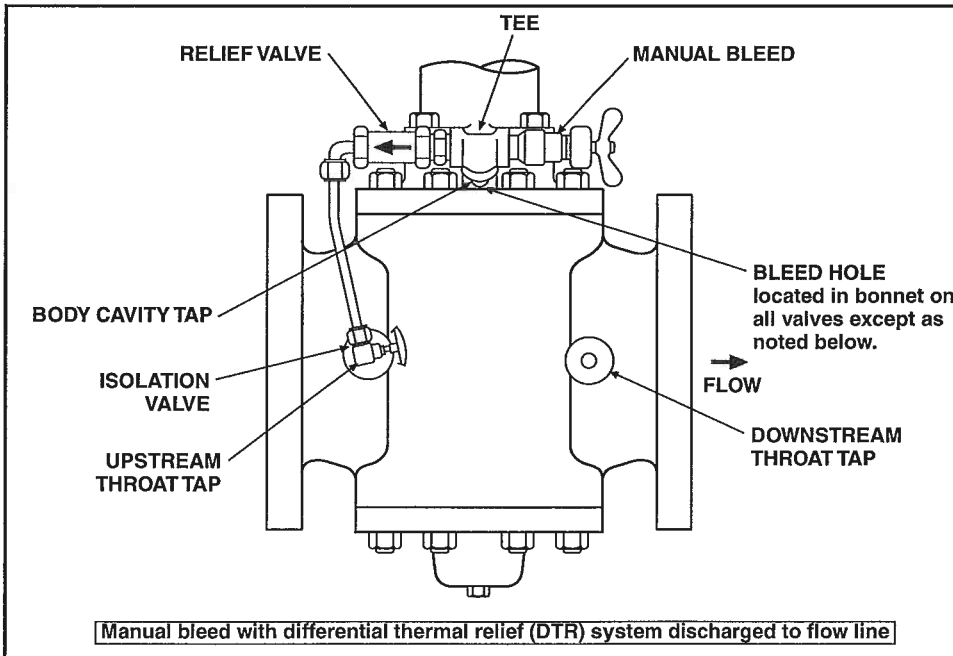
Therefore, the General Twin Seal in liquid service requires a pressure relief device.

The differential (pressure) thermal relief (DTR) system is one such automatic "device" and should be included on every automated valve.

HOW IT WORKS

The differential (pressure) thermal relief (DTR) system is arranged as shown below. A variety of components are used in the DTR. As shown here, one can see that the relief valve mounted at the tee outlet on the bonnet pipes over pressure to upstream throat of the valve. The standard relief valve is set to open at 25 PSI on all valves regardless of working pressure. With the valve closed, the relief valve will open at 25 PSI above upstream pressure. This system functions only when the valve is closed.

An isolation valve installed in the upstream throat tap is also included on the standard DTR. It must be left open to permit relief system to relieve pressure upstream.



The isolation valve will be used only for maintenance and trouble shooting which will be explained later.

Valve is to be **CLOSED ONLY FOR REPAIR**. If closed during normal operation the automatic portion of the relief system (relief/check valve) will be defeated. (The outlet of the relief valve would close when closing the isolation valve).

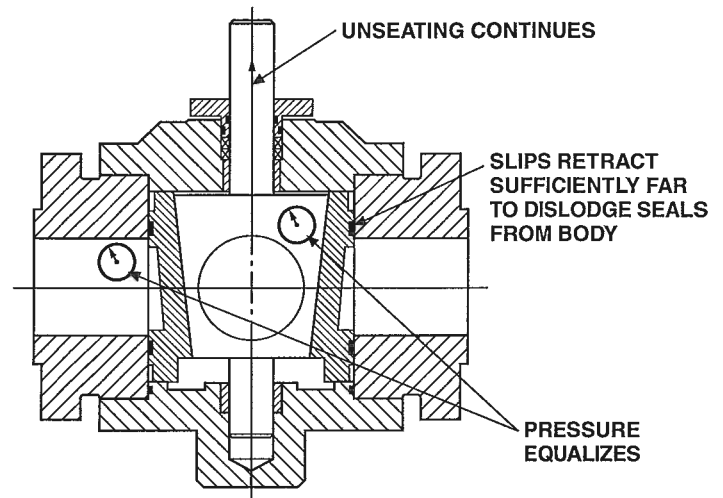
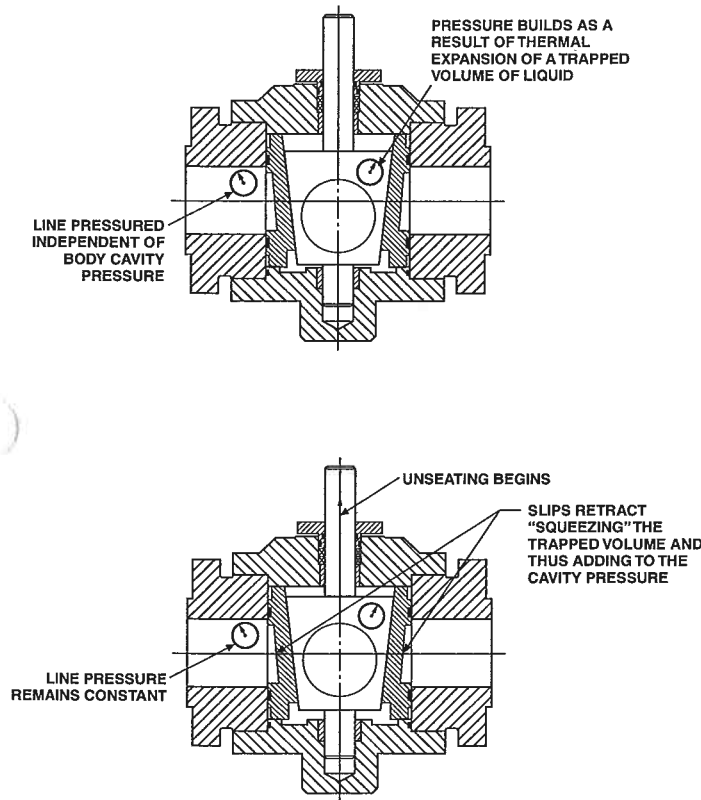
A manual body bleed valve is included on the General Twin Seal as standard. This bleed valve installed in the relief system is opened after the Twin Seal is closed. Seal effectiveness can be immediately evaluated, after allowing a few seconds for stabilization of cavity volume due to entrained air or gas. The bleed valve must be closed before the Twin Seal is reopened.

The remaining components of the bleed system i.e., tube fittings, nipples, pipe fittings etc., are not functionally involved in "how it works" but may be involved in "why it doesn't work" which will be discussed later.

WHY IT IS ESPECIALLY IMPORTANT ON MOTOR OPERATED VALVES

Electrically powered actuators or motor operators are configured normally to bypass or ignore the opening torque limiter as the valve just begins unseating.

If the motor operated General Twin Seal has experienced any thermal expansion the pressure in the body cavity may have increased significantly above line pressure (see figure below) which would hydrostatically cause unseat load resistance. Worse yet, as these slips are pulled inwardly by the ascending plug the trapped body cavity volume is squeezed like an accordion.



CONCERNS OF OTHER TYPES OF ACTUATORS

Other remotely power operated valves, i.e. hydraulic, pneumatic, DC, etc., may display stall problems during unseat if no automatic pressure protection (DTR) is installed, therefore DTR is required in these applications also. But stall torque does not represent same damaging concern.

MANUALLY OPERATED VALVES

Manually operated valves (operated locally) allow access to their manual body bleed valves which may be vented slightly to relieve this pumping action as well as thermal build up. If this center cavity cannot be vented to the atmosphere for environmental or safety reasons, the DTR may be required. Optionally, a manual body bleed alone may be acceptable.

Symptom	Problem	Solution
Valve stalls as it unseats	Isolation valve closed Relief check valve installed backwards	Open isolation valve - close only to repair Close isolation valve seat valve bleed and drain valve remove check/relief reverse reinstall close bleed open isolation valve
Tubing/piping leaking	Check valve plugged foreign material Loose fittings/nipple damaged bleed	Same as above but replace or clean Close isolation valve close valve bleed and drain valve, repair as required open isolation valve close bleed

This pumps the body cavity pressure even higher adding directly to the thermal expansion pressure until something gives, such as...

- 1) The slip seals retract or
- 2) The motor stalls or
- 3) Something breaks or
- 4) The DTR relieves

Since our slip seals are so dependably bubble tight and motor stall may be as high as 6 times maximum rated torque (remember the torque limiter is out of the unseat circuit) we see that electric motor operators MUST have AUTOMATIC pressure protection which is, as shown previously, exactly what the DTR does best. Torque switch settings on electric actuators should be set higher on the opening direction than the closing direction.

In order to check that your bleed system is properly working, install or observe a proper pressure gauge upstream of the valve. Seat the General Twin Seal™, verify integrity. Hook up a hand pump with ~ proper pressure gauging to the manual body bleed. With the hand pump reservoir full of compatible fluid open MBV, begin pumping slowly observing body cavity pressure. Note it should not exceed upstream pressure by more than 25 PSI. If this is so, the DTR relief has been verified.



OPERATION

The General Twin Seal Valve is a non-lubricated, resilient seal, plug-type valve which has a mechanical means of freeing the plug before it is rotated from the closed to the open position. In opening the valve, the plug is raised, thus retracting the seating segments or slips through their tapered dovetail connections. Only after the slips are fully retracted perpendicularly from the body seat is the plug rotated to the open position.

Conversely, in closing the valve, the plug and slips are rotated freely, with no seal-to-body contact, until the slips are positioned over the ports. Then the plug is driven down between the slips and the tapered surfaces wedge out the slips for a positive upstream as well as downstream shut-off. For maximum upstream sealing, **Do not back off. Do not use cheaters.**

The small Twin Seal Valves are handwheel operated, and require up to 3 turns to open or close. Up to 2¾ turns expand or retract the slips, while ¼ turn rotates the plug. Large valves operate in a similar manner, except that they have enclosed weather-proof worm gearing.

At the top of the valve, a position indicator flag shows the exact plug position. It appears in line with the flow when the valve is open, and perpendicular to the flow when the valve is closed.

Since Twin Seal valves hold bubble-tight, for ease of opening in liquid service, it is important to prevent trapped body pressure from exceeding the working pressure of the valve. Therefore, a relief system is required to prevent pressure buildup in the body cavity.

HANDWHEEL REPOSITIONING

On gear-operated models the handwheel position may be changed as follows:

A) Place valve in full open position. **B)** Remove gear housing cap screws. **C)** Turn handwheel to further **open** the valve—this will turn gear housing. Continue until handwheel comes to desired position and gear housing mounting holes are aligned. **D)** Replace gear housing mounting cap screws. **Be sure short cap screw is inserted below worm shaft.**

MAINTENANCE

The Twin Seal Valve requires no day-to-day maintenance, however, there are some services which may be needed occasionally.

1. Annually, drain plugs in the lower plate should be removed and the residue flushed and drained from the lower plate. In cold climates, before freezing weather sets in, any possible collection of water below valve plug or plug trunnion should be drained out through the lower plate drain plugs.
 - a. Keep the valve operator housing full of lubricant to displace and prevent moisture from accumulating and freezing. The operator is provided with a grease fitting. Lubricant should be injected with the Twin Seal Valve in the **open** position only. Under ordinary conditions, a few pumps of the grease gun semi-annually is sufficient. Use lithium 12 hydroxy stearate or lithium base molydisulfide grease.
 - b. If applicable, temporarily remove ABBV cover and guide pin. Liberally apply grease in this area semi-annually.
2. If at any time the body bleed should indicate a leak which cannot be stopped with ordinary force on handwheel (**no cheaters necessary**), this may be corrected by one of the following:
 - a) Operate valve through open-close cycle while fluid is flowing to flush out valve body. After several flushing attempts, close Twin Seal Valve and check body bleed again. If body bleed still indicates valve leakage, proceed to b).

b) If your valve is supplied with a DTR system, it is possible that the relief valve may be leaking. Check this by temporarily closing the line isolation valve. If the leak stops, repair or replace the relief valve. If this is not the case, the slips need inspection.

c) To inspect or replace slips **the line must be drained.** Then place Twin Seal valve in open position (check body bleed valve for zero line pressure) and remove lower plate (lower plate can be driven off by closing valve, inserting a wedge and then opening valve again). Slips can be removed from plug and inspected or replaced if damaged. Be sure to save the old slips and return to General Valve Company for exchange credit. It is recommended to replace the lower plate O-ring and gasket any time the lower plate is removed and slips are replaced.

If lower plate is not accessible for replacing seating slips, the valve operator and bonnet can be removed (Check body bleed for zero line pressure before removing bonnet) and slips replaced from the top of the valve.

3. If stem packing needs replacement, it can be changed as follows:

- a) Remove operator as described in #4 below.
- b) Remove packing gland and replace inner and outer O-rings and backup ring.
- c) Remove packing rings and replace carefully.
- d) Replace packing gland.
- e) Replace operator as described in #4.

4. To change operator:

- a) Shut down line pressure.
- b) Close Twin Seal Valve extra tightly.
- c) Open bleed valve for zero pressure when removing operator.
- d) Drive out coupling pin (towards guide pin boss).
- e) Remove housing mounting bolts and lift operator off.
- f) Replace new operator in reverse order (insert coupling pin from same side as guide pin boss.)
- g) Close bleed valve.
- h) Check operation of valve.

PARTS

Genuine factory replacement parts are available from General Valve Company, which inventories original equipment parts.

Slips, O-rings and packing are packaged in kits that make ordering simple. Be sure to specify size, series, part number on slip, and type of resilient seal material in your order of replacement slips.

To perform on-site maintenance, a mechanic should keep slip kits and soft good kits on site. Most kits can be shipped from stock, typically within 48 hours after receipt of order.

General Valve Company also offers major valve remanufacturing, emergency repairs, money-saving reconditioned slips, technical assistance by phone, maintenance contracts, startup service and service training seminars.

General Valve Company

a PCC Flow Technologies Company

Main office: 800 Koomey Road • Brookshire Texas 77423

Tel: (281) 934-6013 • Toll-free: (800) 926-2288

Fax: (281) 934-6058 • Toll-free: (800) 765-2266 <http://www.general-valve.com>

West Coast Factory: 2817 Cherry Avenue • Long Beach, California 90806

Tel: (562) 426-5280 • Toll-free: (800) 624-8261 Fax: (562) 595-0296

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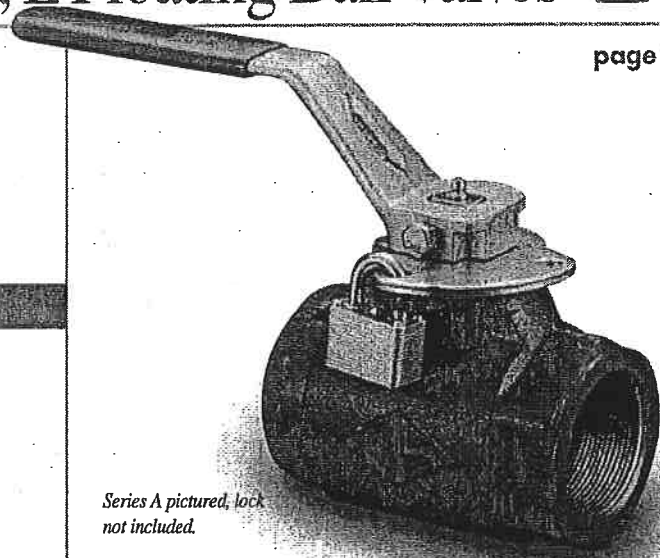
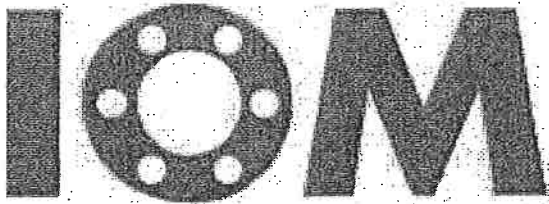
KF Series A, AH, C, CA, E Floating Ball Valves



page 1 of 2

- 1 Installation,
- 2 Operation, And
- 3 Maintenance

? G U I D E



Series A pictured, lock not included.

1 Installation

Install valve in piping system using proper size gaskets/seal rings or threaded end connections. Threaded valves require a thread sealant/lubricant for proper make-up.

Caution: Inspect male pipe thread for damage (i.e. nicks, burrs etc.) prior to installation. Also, do not over tighten NPT connection or thread joint damage may occur. ▲

2 Operation

KF Ball Valves are recommended for on-off service only. Throttling may cause excessive non-uniform wear on seats, preventing tight shut-off. All KF Ball Valves open by rotating handle in counter-clockwise direction. ▲

3 Maintenance

KF Ball Valves are permanently lubricated during assembly and normally require no routine maintenance. However all Series A, AH, C, CA and E assemblies include an external stem lube fitting for periodic lubrication of stem journal if desired. ▲▲

Reconditioning

To replace seats, ball or body seal:

See exploded view on page two. Open valve, unscrew adapter (2) from body (1). Remove body seal (5). Turn ball (4) to the closed position and remove. Remove seats (7) with care to prevent damaging flat surfaces of the seat cavity in body and adapter.

Clean seat cavities and body seal seating surfaces using fine emery. Replace seats and ball. Grease body seal and position it in its groove in the adapter. Replace adapter, assuring that it butts metal-to-metal against the body. ▲

To Replace Stem or Stem Seal:

With ball removed loosen set screw or locknut and lift handle/square nut from stem. Remove retainer (13), allowing removal of stop plate (12) and stem bearing (6). Remove stem (3), stem seals (9), and thrust bearing (10) through body bore. Clean stem journal in body using fine emery. Grease stem journal. Place thrust bearing and stem seals on stem in that order. Apply a coat of grease to all parts. Replace stem, using a wooden pry against the bottom of the stem if necessary. Assure that the stem seals are not pinched during re-assembly. Replace stem bearing, stop plate and retainer. Reaffix handle/square nut on stem and tighten set screw. Re-assemble valve as above. ▲▲

Engineering Solutions for the World's Flow Control Industry

1500 S.E. 89th Street
Oklahoma City, OK 73143-5249
<http://www.kfvalves.com>



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A Division of CIRCOR International, Inc.

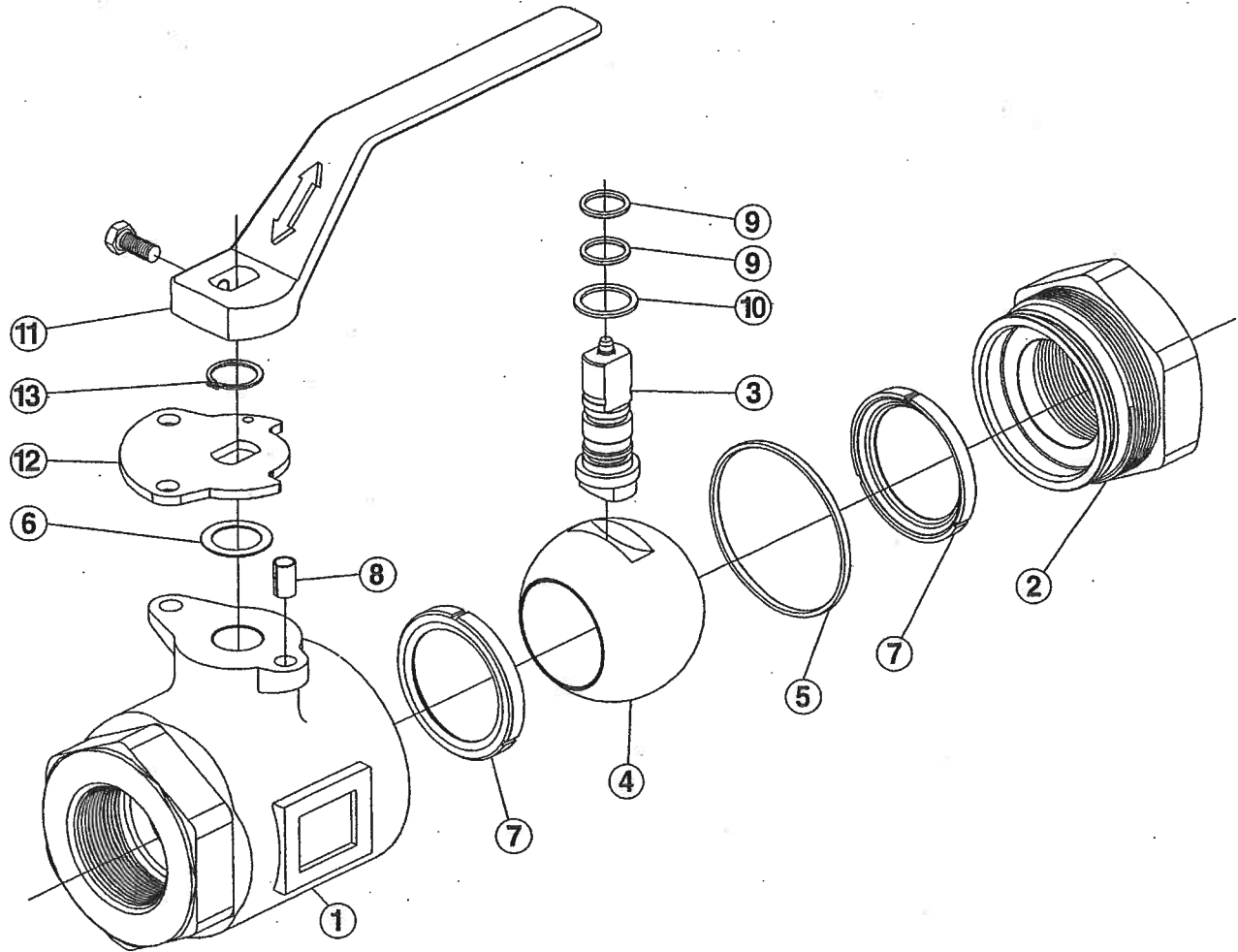
Tel: 405 631-1533
Fax: 405 631-5034
Email: kfinfo@kfvalves.com

KF Series A, AH, C, CA, E Floating Ball Valves



Component Parts

? G U I D E



Parts List

No.	Description	No.	Description	No.	Description	No.	Description
1	Body	5	Adapter Seal	9	Stem Seals	13	Retainer
2	Adapter	6	Stem Bearing	10	Thrust Bearing		
3	Stem	7	Seats	11	Handle/Square Nut		
4	Ball	8	Stop	12	Stop Plate	▲	Return to top

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SERIES A BALL VALVE

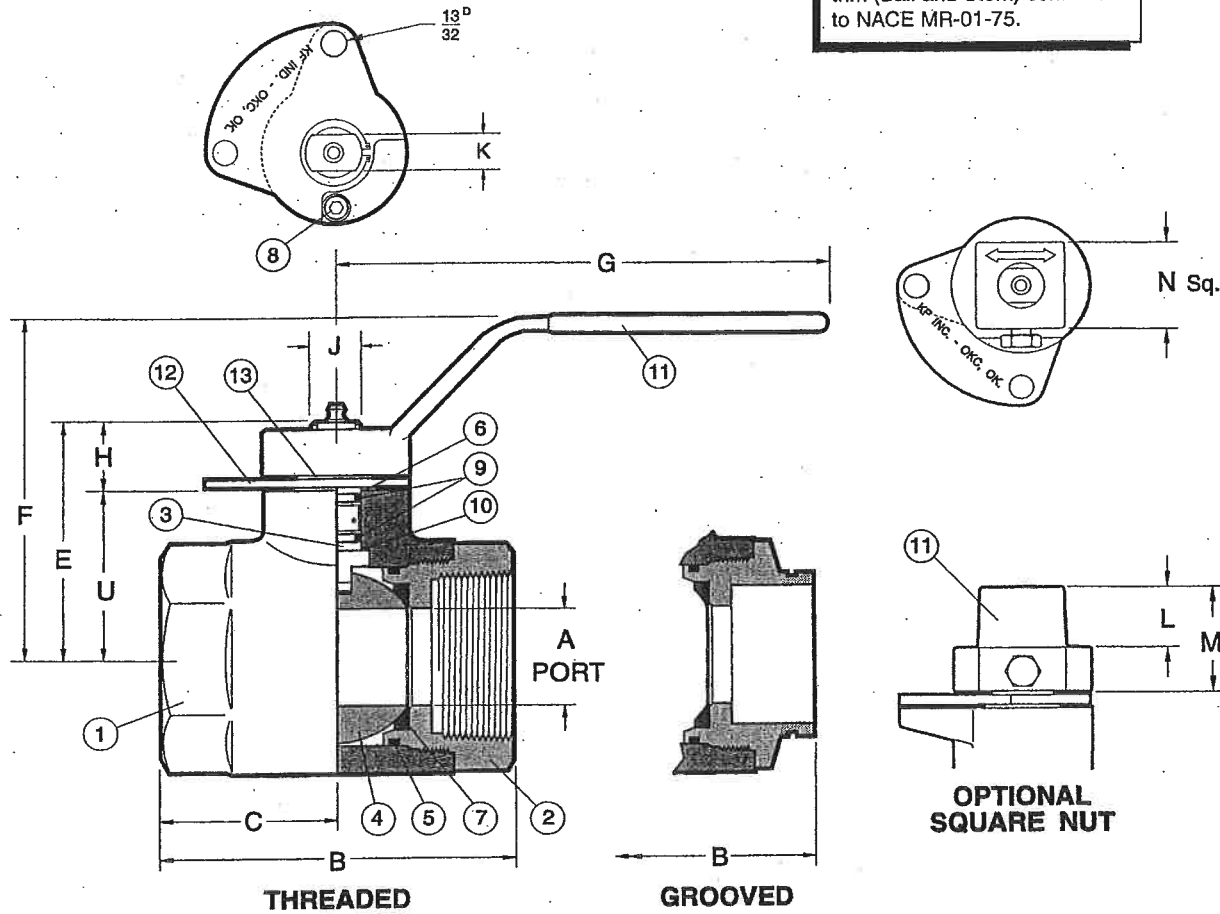
1"FP through 4"RP

1"FP through 3"RP - 1500 psi WP at 100°F

3"FP & 4"RP - 1000 psi WP at 100°F

DB-3
Sheet 1 of 2
4-28-99

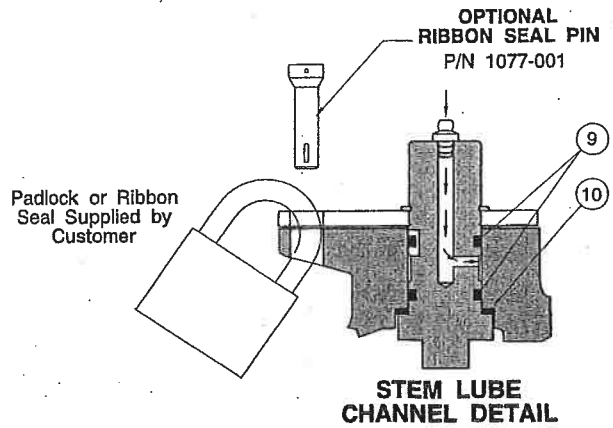
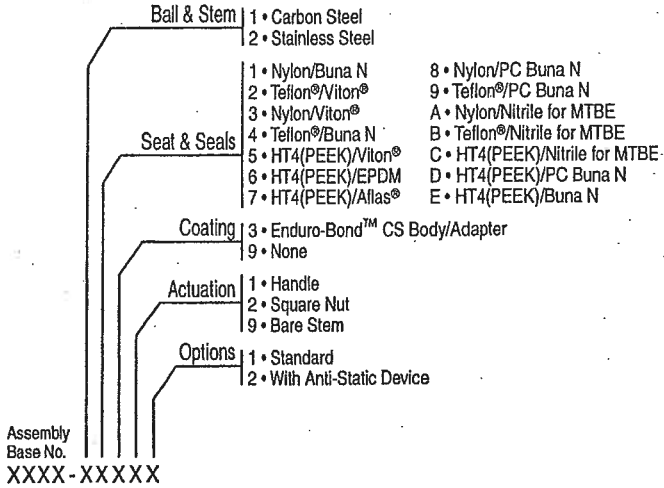
NOTE:
Assemblies with Stainless Steel trim (Ball and Stem) conform to NACE MR-01-75.



DIMENSIONAL DATA

DIMENSION \ SIZE	1"FP 1 x 1	1 1/2"FP 1 1/2 x 1	2"RP 2 x 1	2"FP 2 x 2	2 1/2"RP 2 1/2 x 2	3"RP 3 x 2	3"FP 3 x 3	4"RP 4 x 3
Weight - lbs. with Handle	4.5	13	12.5	18	16.25	22	52	46
A	1	1-1/2	2	2	2	3		
B	4	5-1/2	6	6	6	7-5/16	8-3/4	
	4-7/8	6	6-1/4	6-1/4	7-5/16	8-3/4		
C	2	2-3/4	3	3	3	4-1/8	4-3/8	
E	2-7/16	3-11/16	4-1/8	4-1/8	4-1/8	5-1/2		
F	3-1/16	5-9/16	6-1/16	6-1/16	6-1/16	7-1/4		
G	6-1/4	8-1/2	8-1/2	8-1/2	8-1/2	15		
H	9/16	3/4	3/4	3/4	3/4	1		
J	.623/.621	.873/.871	.873/.871	.873/.871	.873/.871	1.248/1.245		
K	.372/.370	.560/.556	.560/.556	.560/.556	.560/.556	.621/.618		
L	---	1	1	1	1	1-1/8		
M	---	1-3/4	1-3/4	1-3/4	1-3/4	2-3/16		
N	---	1-7/16	1-7/16	1-7/16	1-7/16	1-13/16		
U	1-23/32	2-5/8	3-1/16	3-1/16	3-1/16	4		

ASSEMBLY PART No. CODE



NOTE:
Assemblies with Stainless Steel trim (Ball and Stem) conform to NACE MR-01-75.

ASSEMBLY BASE NUMBERS

END CONN.	SIZE	1"FP	1-1/2"FP	2"RP	2"FP	2-1/2"RP	3"RP	3"FP	4"RP
THREADED		2339-	2340-	2341-	2342-	2343-	2344-	2345-	2346-
GROOVED		2354-	2347-	2348-	2349-	2350-	2351-	2352-	2353-

PARTS LIST

INDEX	REQ'D	DESCRIPTION	MATERIAL
1	1	BODY	ASTM 395 Ductile Iron
2	1	ADAPTER	A108 CS 1018 CF (1FP - 1-1/2FP), A216 CS WCB. (2-1/2RP), ASTM 395 DI (2FP - 4RP)
3*	1	STEM ASSEMBLY	316 Stainless Steel, or Stressproof CF, Plated
4*	1	BALL	316 Stainless Steel, or 1215 CS w/Nickel over Chrome Plating
5*	1	BODY SEAL	Buna N, Viton®, EPDM, Atlas®, or PC Buna N
6*	1	STEM BEARING	Nylon or PEEK (w/PEEK seats)
7*	2	SEAT	Nylon, Teflon® or HT4 (PEEK)
8*	1	STOP	Steel
9*	2	STEM SEAL	Buna N, Viton, EPDM, Atlas®, or PC Buna N
10*	1	THRUST BEARING	Teflon® or PEEK (w/PEEK seats)
11*	1	HANDLE ASSEMBLY	1018 CS (1FP), A47 Malleable Iron (1-1/2FP - 4RP)
11*	1	SQUARE NUT ASSEMBLY	GR. 32510 Malleable Iron
12	1	STOP PLATE	Steel / Cadmium Plated
13	1	RETAINER	Spring Steel

* Recommended spare parts for 1 year service.

FLOW COEFFICIENT (Cv)

1"FP	1-1/2"FP	2"RP	2-1/2"RP	2"FP	3"RP	3"FP	4"RP
185	308	140	220	500	220	1390	630

**KF INDUSTRIES
CODES & STANDARDS
Revised 1/29/01**

I. Series A, AH, and EH – Floating Ball Valves (Threaded)

Sizes:
1" – 4"

Body Pressure Rating:
Ser A - 1500 psi: 1" thru 3" Bore
 1000 psi: 3" & 4" Bore
Ser AH - 2000 psi:
Ser E - 750 psi:
Ser EH - 1000 psi:

Note: optional seat materials
such as Teflon require derating
of valve working pressure.

Material Standards – Body

- a) ASTM A395.....Ductile Iron Castings
- b) NACE MR-01-75.....Materials for H2S Service (when specified)

Quality Codes and Standards

- a) ANSI/ASME B1.20.1.....Pipe Threads, General Purpose
- b) MSS-SP-25.....Standard Marking System for Valves
- c) ISO 9001.....Quality System Standard

II. Series B, BH, C, CH, and CXH – Floating Ball Valves (Threaded & Socket-Weld)

Sizes:
1/4" - 4"

Body Pressure Rating:
Ser B - 3000 psi:
Ser BH - 5000 psi:
Ser C - 2500 psi: 1" & 1-1/2 Bore
 2160 psi:
Ser CXH 3000 psi:

Material Standards – Body

- a) ASTM A216 Gr. WCB.....Carbon Steel Castings (all except 1-1/2" bore)
- ASTM A105.....Carbon Steel Forging
 (1-1/2" Bore Series C, CH, & CXH)
- ASTM A351 CF8M.....Stainless Steel Castings
- b) NACE MR-01-75.....Materials for H2S Service (when specified).

Quality Codes & Standards

- a) ANSI/ASME B1.20.1.....Pipe Threads, General Purpose
- b) MSS-SP-25.....Standard Marking System for Valves
- c) MSS-SP-55.....Quality Standard for Steel Castings
- d) API 607.....Firesafe
- e) ISO 9001.....Quality System Standard

**KF INDUSTRIES
CODES & STANDARDS
Revised 1/29/01**

**III. Series EC – Floating Ball Valves – Grooved End Connection (ES Victaulic End)
No Standard End-To-End**

Sizes:
2" – 4"

Pressure Rating:
600 psi

Material Standards – Body

- a) ASTM A351 CF8M. Stainless Steel Castings
- b) NACE MR-01-75. Materials for H2S Service (when specified).

Quality Codes & Standards

- a) MSS-SP-25. Standard Marking System for Valves
- b) MSS-SP-55. Quality Standard for Steel Castings
- c) ISO 9001. Quality System Standard

IV. Series CA – Floating Ball Valves

Sizes:
2-1/16" & 2-9/16"

Pressure Rating:
2000 psi

Material Standards – Body

- a) ASTM A487-4C. Alloy Steel Castings
- b) NACE MR-01-75. Materials for H2S Service (when specified).

Quality Codes & Standards

- a) API 5B EUE. External Upset Tubing Threads
- b) MSS-SP-25. Standard Marking System for Valves
- c) MSS-SP-55. Quality Standard for Steel Castings
- d) ISO 9001. Quality System Standard

**KF INDUSTRIES
CODES & STANDARDS
Revised 1/29/01**

V. Series W – Floating Ball Valves (Threaded)

Sizes:
1/4" – 2"

Pressure Rating:
2000 psi

Material Standards – Body

- a) ASTM A216 Gr. WCB. Carbon Steel Castings
 ASTM 1 351 CF8M. Stainless Steel Castings

- b) NACE MR-01-75. Materials for H2S Service (when specified).

Quality Codes & Standards

- a) ANSI/ASME B1.20.1. Pipe Threads, General Purpose
- b) MSS-SP-25. Standard Marking System for Valves
- c) MSS-SP-55. Quality Standard for Steel Castings
- d) ISO 9001. Quality System Standard

VI. Series CB and CBH – Floating Ball Valves (Threaded)

Sizes:
1" – 2"

Pressure Rating:
Ser CB – 2500 psi
Ser CBH – 3000 psi

Material Standards – Body

- a) ASTM B148-95. Nickel Aluminum Bronze Casting

Quality Codes & Standards

- a) ANSI/ASME B 1.20.1. Pipe Threads, General Purpose
- b) MSS-SP-25. Standard Marking System for Valves
- c) MSS-SP-55. Quality Standard for Steel Castings
- d) ISO 9001. Quality System Standard

**KF INDUSTRIES
CODES & STANDARDS
Revised 1/29/01**

VII. Series F – Floating Ball Valves (Flanged RF, RTJ)

Sizes:
½" – 10"

Pressure Rating:
ANSI 150 – ANSI 1500

Material Standards – Body, Adapter, & Bolting

- a) ASTM A216 Gr. WCB/WCC. . . . Carbon Steel Castings
- b) ASTM A352 Gr. LCB/LCC. . . . Carbon Steel Castings (Lo Temp)
- c) ASTM A351 CF8M. Stainless Steel Body Castings
- d) ASTM A193-B7 (B7M). Studs (NACE)
ASTM A194-2H (2HM). Nuts (NACE)
ASTM A320-L7 (L7M). Studs & Nuts – Low Temp. (NACE)
- e) NACE MR-01-75. Materials for H2S Service (when specified)

Quality Codes & Standards

- a) API 6D. Pipeline Valves
- b) ANSI B16.34. Valves, Flanged & Butt-weld (when specified)
- c) Coast Guard 46 CFR
Subch. F Category A & B. (when specified-reqs. Marking "ANSI B16.34")
- d) American Bureau of Shipping
Paragraph 36 15.1. (when specified-reqs. Marking "ANSI B16.34")
- e) Dot 192 Cl. 3 Federal Safety Standards for Natural Gas
Pipelines

- f) ANSI B16.10. Face to Face of Ferrous Valves
- g) ANSI B16.5. Pipe Flanges
- h) API 607. Firesafe
- i) BS 6755 Part 2. Firesafe

- j) MSS-SP-6. Standard Finishes for Pipe Flange Faces
- k) MSS-SP-25. Standard Marking System for Valves
- l) MSS-SP-55. Quality Standard for Steel Castings
- m) MSS-SP-72. Flanged Ball Valves for General Services
- n) ISO 9001. Quality System Standard
- o) API Q1. Quality Program Specification

**KF INDUSTRIES
CODES & STANDARDS
Revised 1/29/01**

VIII. Series FA – Trunnion End-Entry Ball Valves (Flanged RF) 2" – 12" Cl. 150/300

Sizes:
2" – 14"

Pressure Rating:
ANSI 150 – ANSI 300

Material Standards – Body, Bonnet, & Bolting

- a) ASTM A216 Gr. WCB. Carbon Steel Castings
- ASTM 1 351 CF8M. Stainless Steel Casting
- ASTM A105. Carbon Steel Forgings
- ASTM A182. Stainless Steel Forgings
- ASTM A350 LF2. Carbon Steel Forgings – Lo Temp.
- ASTM A352 Gr. LCB/LCC. Carbon Steel Castings – Lo Temp.
- ASTM A193 – B7 (B7M). Bolting (NACE)
- ASTM A320-L7 (L7M). Bolting – Lo Temp. (NACE)
- b) NACE MR-01-75. Materials for H2S Service (when specified)

Quality Codes & Standards

- a) API 6D Pipeline Valves
- b) ANSI B16.34. Valves, Flanged & Butt Weld
- c) Coast Guard 46 CFR Subch. F. Category A & B
- d) American Bureau of Shipping. Paragraph 36, 15.1
- e) DOT 192 CI 3. Federal Safety Standard for Natural Gas
Pipelines
- f) ANSI B16.10. Face to Face of Ferrous Valves
- g) ANSI B16.5. Pipe Flanges

- h) ANSI B16.25. Butt Weld End Configuration
- i) API 6FA. Firesafe
- j) API 607. Firesafe
- k) MSS-SP-6. Standard Finishes for Pipe Flange Faces
- l) MSS-SP-25. Standard Marking System for Steel Castings
- m) MSS-SP-55. Quality Standard for Steel Castings
- n) MSS-SP-72. Flanged Ball Valves for General Services
- o) ISO 9001. Quality System Standard
- p) API Q1. Quality Program Specification

**KF INDUSTRIES
CODES & STANDARDS
Revised 1/29/01**

IX. Series T & TW – Trunnion Top – Entry Ball Valves (RF, RTJ, WELD)

Sizes:
2" – 36"

Pressure Rating:
ANSI 600 – ANSI 2500

Material Standards – Body

- a) ASTM A216 Gr. WCB/WCC. Carbon Steel Castings
- ASTM A352 Gr. LCB/LCC. Carbon Steel Castings – Lo Temp.
- ASTM A487 Gr. 4C. Carbon Steel Castings (API 6A)
- ASTM A351 CF8M. Stainless Steel Castings
- ASTM A105. Carbon Steel Forgings
- ASTM A350-LF2. Carbon Steel Forgings – Lo Temp.
- ASTM A182. Stainless Steel Forgings
- ASTM A193-B7 (B7M). Bolting (NACE)
- ASTM A320-L7 (L7M). Bolting - Lo Temp. (NACE)
- b) NACE MR-01-75. Materials for H2S Service (when specified)

Quality Codes & Standards

- a) API 6A. Wellhead Valves
- b) API 6D. Pipeline Valves
- c) ANSI B16.34. Valves, Flanged & Butt weld
- d) Coast Guard 46 CFR Subsch. F. Category A & B
- e) American Bureau of Shipping. Paragraph 36 15.1
- f) DOT 192 Cl. 3. Federal Safety Standards for Natural Gas
Pipelines
- g) ANSI B16.10. Face to Face of Ferrous Valves
- h) ANSI B16.5. Pipe Flanges
- i) ANSI B16.25. Butt weld End Configuration
- j) API 6FA. Firesafe
- k) API 607. Firesafe
- l) BS 6755: Part 2. Firesafe
- m) MSS-SP-6. Standard Finishes for Pipe Flange Faces
- n) MSS-SP-25. Standard Marking System for Valves
- o) MSS-SP-55. Quality Standard for Steel Castings
- p) MSS-SP-72. Flanged Ball Valves for General Service
- q) ISO 9001. Quality System Standard
- r) API Q1. Quality Program Specification

**KF INDUSTRIES
CODES & STANDARDS
Revised 1/29/01**

X. Series P, P2, P3 – Trunnion End – Entry Ball Valves, 3-pc & 2-pc (RF, RTJ, WELD)

Sizes:
1" – 60"

Pressure Rating:
ANSI 150 – ANSI 2500
API 2000 – 10,000 psi

Material Standards – Body, Bonnet, Adapter, & Bolting

- a) ASTM A216 Gr. WCB/WCC. Carbon Steel Castings
- ASTM A352 Gr. LCB/LCC. Carbon Steel Castings – Lo Temp.
- ASTM A487 Gr. 4C. Carbon Steel Castings (API 6A)
- ASTM A351 CF8M. Stainless Steel Castings
- ASTM A105. Carbon Steel Forgings
- ASTM A350-LF2. Carbon Steel Forgings – Lo Temp.
- ASTM A182. Stainless Steel Forgings
- ASTM A193-B7 (B7M). Bolting (NACE)
- ASTM A320-L7 (L7M). Bolting - Lo Temp. (NACE)
- b) NACE MR-01-75. Materials for H2S Service (when specified)

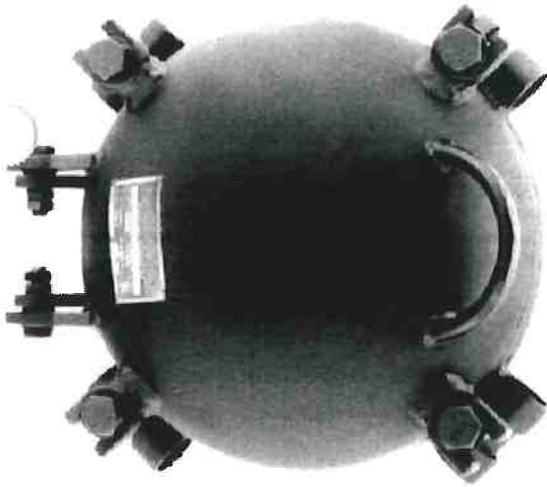
Quality Codes & Standards

- a) API 6D. Pipeline Valves
- b) ANSI B16.34. Valves, Flanged, & Butt weld
- c) Coast Guard 46 CFR Subch. F. Category A & B
- d) American Bureau of Shipping. Paragraph 36, 15.1
- e) DOT 192 Cl. 3. Federal Safety standards for Natural Gas Pipelines
- f) ANSI B16.10. Face to Face of Ferrous Valves
- g) ANSI B16.5. Pipe Flanges
- h) ANSI B16.25. Butt weld End Configuration
- i) API 6FA. Firesafe
- j) API 607. Firesafe
- k) MSS-SP-6. Standard Finishes for Pipe Flange Faces
- l) MSS-SP-25. Standard Marking System for Valves
- m) MSS-SP-55 Quality Standard for Steel Castings
- n) MSS-SP-72 Flanged Ball valves for General Service
- o) ISO 9001. Quality System Standard
- p) API Q1. Quality Program Specification



J-10 Manufacturers Catalog Data – Pig Trap Closures

T-BOLT CLOSURES



Class 75-TB, 150-TB and 300-TB

U.S. Pat. No. 3,187,929

	Nom. Pipe Size	Nom.* Wall Thickness	Over-all A	O.D. at Welding Bevel B	Back to Face C	Hub Length D	Clear Hub* Length E	Center to Hinge End F	Swing Bolt Clearance J	Opening Clearance K	No. Bolts	Bolt Size	Approx. Weight Lbs
Class 75-TB T-Bolt Horizontal	10	.500	13 ³ / ₈	10 ³ / ₄	2 ⁷ / ₁₆	2 ¹ / ₂	⁵ / ₈	7 ⁵ / ₈	18	12 ¹ / ₈	3	¹ / ₂	30
	12	.500	16 ¹ / ₈	12 ³ / ₄	2 ¹ ⁵ / ₁₆	2 ³ / ₈	³ / ₄	8 ¹ ⁵ / ₁₆	21	14 ³ / ₈	4	⁵ / ₈	50
	14	.500	17 ³ / ₈	14	3 ¹ / ₄	2 ⁷ / ₈	1	9 ⁹ / ₁₆	22	15 ¹ / ₂	4	⁵ / ₈	60
	16	.500	19 ³ / ₈	16	3 ³ / ₄	2 ⁷ / ₈	1	10 ¹ / ₂	24	17 ¹ / ₂	4	⁵ / ₈	70
	18	.500	21 ³ / ₈	18	4 ¹ / ₄	3 ³ / ₈	1 ³ / ₈	11 ¹ ¹ / ₁₆	30	19 ¹ / ₂	4	⁷ / ₈	95
	20	.500	23 ³ / ₈	20	4 ³ / ₄	3 ⁷ / ₈	1 ¹ ¹ / ₁₆	12 ¹ ⁹ / ₁₆	32	21 ¹ ¹ / ₁₆	4	⁷ / ₈	115
	22	.500	25 ³ / ₈	22	5 ¹ / ₄	4 ³ / ₈	2 ³ / ₈	13 ¹ ⁵ / ₁₆	34	23 ¹ ¹ / ₁₆	5	⁷ / ₈	140
	24	.500	27 ⁷ / ₈	24	5 ³ / ₄	4 ³ / ₈	1 ¹ ³ / ₁₆	15	38	25 ¹ ¹ / ₁₆	5	⁷ / ₈	165
	26	.500	29 ⁷ / ₈	26	6 ¹ / ₄	3 ⁷ / ₈	1 ⁵ / ₁₆	16 ¹ / ₄	40	28	6	⁷ / ₈	180
	28	.500	31 ⁷ / ₈	28	6 ³ / ₄	3 ³ / ₈	1 ¹ / ₈	17 ¹ / ₄	42	30	6	⁷ / ₈	200
	30	.500	33 ⁷ / ₈	30	7 ¹ / ₄	3 ³ / ₈	⁷ / ₈	18 ⁹ / ₁₆	45	32	8	⁷ / ₈	230
	32	.500	35 ⁷ / ₈	32	7 ³ / ₄	4 ³ / ₈	2	19 ⁵ / ₈	47	34	9	⁷ / ₈	265
	34	.625	38 ³ / ₄	34	8 ¹ / ₄	4 ³ / ₈	1 ⁵ / ₁₆	20 ⁵ / ₈	51	36	9	1 ¹ / ₈	325
	36	.625	40 ³ / ₄	36	8 ¹ ¹ / ₁₆	4 ¹ / ₂	1 ³ / ₈	21 ⁹ / ₁₆	53	38	9	1 ¹ / ₈	410
38	.625	42 ³ / ₄	38	9 ³ / ₁₆	4 ¹ / ₂	1 ⁵ / ₈	22 ⁹ / ₁₆	55	40	10	1 ¹ / ₈	450	
40	.625	44 ³ / ₄	40	9 ¹ ¹ / ₁₆	4 ¹ / ₂	1 ⁵ / ₈	22 ³ / ₄	57	42	10	1 ¹ / ₈	480	
42	.625	46 ³ / ₄	42	10 ³ / ₁₆	4 ¹ / ₂	1 ⁵ / ₈	25 ⁵ / ₁₆	61	44 ³ / ₄	11	1 ¹ / ₈	550	
48	.750	52 ³ / ₄	48	11 ⁵ / ₈	6 ¹ / ₈	3 ¹ / ₄	28	67	50 ¹ / ₄	14	1 ¹ / ₈	830	

All dimensions are in inches. When ordering, please specify class, nominal size, bore, material and service conditions.

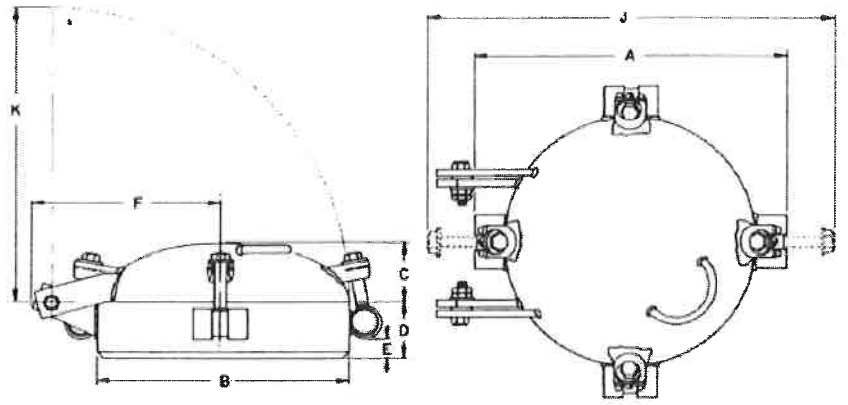
TUBE TURNS T-Bolt Hinged Closures are regularly furnished in carbon steel; however, they are available in stainless steel and other metals and alloys.

For Pressure Ratings, see page 25.

T Bolt Closures with longer hubs; Closures made to I.D. dimensions; or Closures equipped with Sight Glasses, Break-Over Wrenches, Camlocks and other appurtenances are available on special order.

*Standard Closures are taper bored to match standard weight.

I-BOLT CLOSURES



	Nom. Pipe Size	Nom. * Wall Thickness	Over-all A	O.D. at Welding Bevel B	Back to Face C	Hub Length D	Clear Hub Length E	Center to Hinge End F	Swing Bolt Clearance J	Opening Clearance K	No. Bolts	Bolt Size	Approx. Weight Lbs
Class 150-TB T-Bolt Horizontal	6	.432	9 1/4	6 5/8	1 7/8	1 1/16	1/4	5 1/2	13	8	3	1/2	15
	8	.500	11 1/4	8 5/8	1 15/16	1 5/8	1/4	6 5/8	15	10 1/8	3	1/2	20
	10	.500	14 1/8	10 3/4	2 7/16	2 1/8	5/16	7 5/8	19	12 1/4	4	5/8	35
	12	.500	16 1/8	12 3/4	2 15/16	2 5/8	3/4	9	23	14 5/16	4	3/4	55
	14	.500	17 3/8	14	3 1/4	2 7/8	1	9 9/16	24	15 1/2	4	3/4	65
	16	.500	19 3/8	16	3 3/4	2 7/8	1	10 1/2	26	17 1/2	7	5/8	80
	18	.500	21 3/8	18	4 1/4	3 3/8	1 3/8	11 1/16	30	19 1/2	6	3/4	100
	20	.500	23 3/8	20	4 3/4	3 7/8	1 1 1/16	12 1/16	32	21 1/16	7	3/4	125
	22	.500	25 3/4	22	5 1/4	4 3/8	2	15 1/2	36	25 3/16	7	7/8	150
	24	.500	27 7/8	24	5 3/4	4 3/8	1 13/16	15	38	25 11/16	8	7/8	180
	26	.500	29 7/8	26	6 1/4	3 7/8	1 5/16	16 1/4	40	28 1/16	9	7/8	200
	28	.500	31 7/8	28	6 3/4	3 7/8	1 1/8	17 1/4	43	30	11	7/8	225
	30	.500	33 7/8	30	7 1/4	3 7/8	7/8	18 5/16	45	32	12	7/8	250
	32	.500	36 3/4	32	7 3/4	4 1/8	1 9/16	19 9/8	49	34	10	1 1/8	310
	34	.625	38 3/4	34	8 3/16	4 3/8	1 5/16	20 5/8	53	36	10	1 1/8	380
	36	.625	40 3/4	36	8 1 1/16	4 1/2	1 3/8	21 9/16	55	38	11	1 1/8	460
38	.625	42 3/4	38	9 3/16	4 1/2	1 5/8	22 1 1/16	57	40 1/16	13	1 1/8	500	
40	.625	44 3/4	40	9 1 1/16	4 1/2	1 5/8	23 3/16	59	41 1 1/16	14	1 1/8	550	
42	.625	46 3/4	42	10 3/16	4 1/2	1 5/8	24 1 1/16	61	44 1/16	15	1 1/8	600	
48	.750	52 3/4	48	11 5/8	6 1/8	3 1/4	32 3/8	67	52	16	1 1/8	860	
Class 300-TB T-Bolt Horizontal	6	.432	9 7/8	6 5/8	1 7/8	2 1/16	5/16	5 5/8	16	8 1/8	3	5/8	18
	8	.500	11 7/8	8 5/8	1 15/16	2 1/8	1/4	6 9/16	19	10 1/8	4	5/8	27
	10	.500	14	10 3/4	2 7/16	2 1/2	3/8	7 5/8	20	12 1/4	4	3/4	35
	12	.500	16	12 3/4	2 15/16	2 5/8	3/4	8 3/16	23	14 1/4	6	3/4	55
	14	.500	17 1/4	14	3 1/4	2 7/8	1	9 9/16	25	15 1/2	7	3/4	70
	16	.500	19 1 1/16	16	3 3/4	2 7/8	9/16	10 1/2	29	17 1/2	7	7/8	85
	18	.500	22 3/4	18	4 1/4	3 3/8	5/8	12 1/4	33	20 1/16	6	1 1/8	130
	20	.500	24 3/4	20	4 3/4	3 7/8	1	12 5/16	36	21 1 1/16	7	1 1/8	175
	22	.500	26 3/4	22	5 1/4	4 3/8	1 5/8	13 5/16	38	23 1 1/16	8	1 1/8	200
	24	.500	28 3/4	24	5 3/4	4 3/8	1 1/2	15	40	25 1 1/16	9	1 1/8	230
	26	.500	30 3/4	26	6 1/4	4 3/8	1 1/4	16 5/8	42	28 5/8	9	1 1/8	250
	28	.500	32 3/4	28	6 3/4	4 3/8	1 5/8	17 5/8	45	30	10	1 1/8	275
	30	.500	34 3/4	30	7 1/4	4 3/8	1 1 1/16	18 5/16	47	32	11	1 1/8	300
	32	.500	36 3/4	32	7 3/4	4 3/8	1 5/16	19 1 1/16	49	34 7/16	11	1 1/8	360
	34	.625	38 3/4	34	8 1/4	4 3/8	1 5/16	20 5/8	53	36	12	1 1/8	440
	36	.625	40 3/4	36	8 1 1/16	4 1/2	1 3/8	21 9/16	55	38	12	1 1/8	510

(Refer to page 26 for Notes applicable to Class 75, 150 and 300 T-Bolt Closures.)

For Pressure Ratings, see page 25.

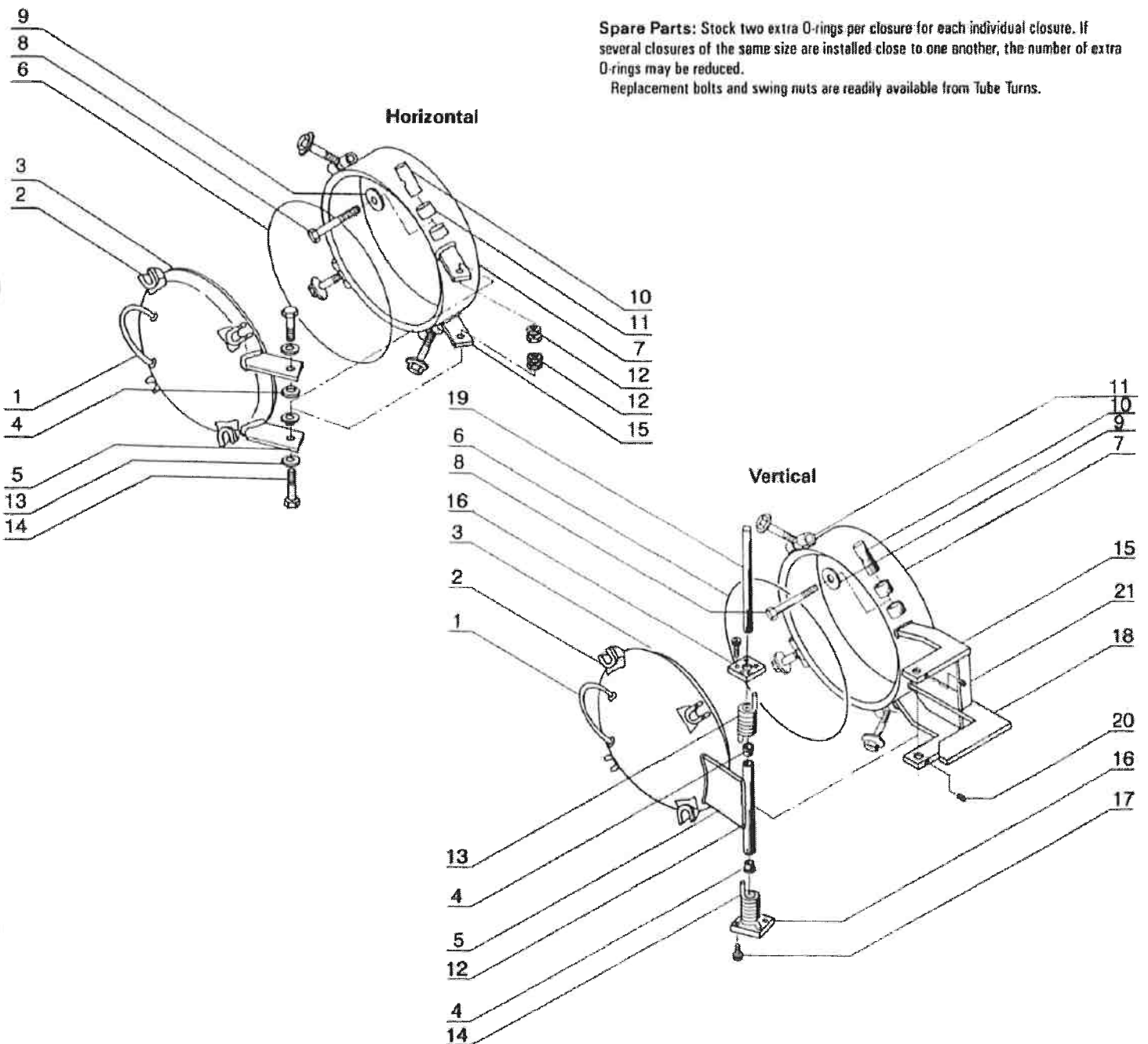
T-BOLT CLOSURES

T-Bolt Closure Horizontal Parts List

- | | | | |
|-------------------|-------------------|----------------------|-----------------------|
| 1. Head Handle | 5. Head Hinge Arm | 9. Head Bolt Washer | 13. Hinge Bolt Washer |
| 2. Head Bolt Lug | 6. O-ring | 10. Tapped Swing Nut | 14. Hinge Bolt |
| 3. Head | 7. Hub | 11. Hub Nut Mounts | 15. Hub Hinge Arms |
| 4. Hinge Bushings | 8. Head Bolt | 12. Hinge Bolt Nut | |

T-Bolt Closure Vertical Parts List

- | | | | |
|-------------------|----------------------|---------------------|-------------------------|
| 1. Head Handle | 7. Hub | 12. Hinge Tube | 17. Lock Screw |
| 2. Head Bolt | 8. Head Bolt | 13. Spring (R.H.) | 18. Head Stop |
| 3. Head | 9. Head Bolt Washer | 14. Spring (L.H.) | 19. Hinge Rod |
| 4. Hinge Bushing | 10. Tapped Swing Nut | 15. Hub Hinge Arms | 20. Hinge Rod Set Screw |
| 5. Head Hinge Arm | 11. Hub Nut Mounts | 16. Adjusting Plate | 21. Hinge Brace |
| 6. O-ring | | | |



Spare Parts: Stock two extra O-rings per closure for each individual closure. If several closures of the same size are installed close to one another, the number of extra O-rings may be reduced.

Replacement bolts and swing nuts are readily available from Tube Turns.



Installation, Operation & Maintenance T-Bolt Hinged Closures

Caution: Operating a closure can be a hazardous activity and certain precautions should be exercised. All instructions should be read carefully by personnel engaged in installation, operation and maintenance.

Installation

The T-Bolt hinged closure is joined to the pipe or vessel nozzle by a circumferential butt-weld, employing standard welding techniques appropriate to the particular installation.

Improper welding, weld sequencing or vessel design can cause detrimental distortion in the closure. Welding of nozzles, sight glass frames, reinforcing rings, structural attachments, etc., to the closure should be done at the factory. If this is not possible, the following precautions must be followed for all welding performed after shipment from the factory.

- (1) Large nozzle(s) "stubbed" into the closure hub may distort the hub to the extent that the closure will not seal.
- (2) If nozzle(s) are to be "stubbed" in the vessel near the vessel-to-closure hub attachment weld, they should be completed before performing the vessel-to-closure hub attachment weld.
- (3) If any attachments are to be made to the head, the o-ring should be removed and the closure tightly closed before welding.
- (4) Do not remove the closure head from the hub. If absolutely necessary to remove the head, be sure to identify each head with its particular hub and reassemble before welding. Heads and hubs are not interchangeable.

Installation procedure:

- (1) Remove O-ring if in place in the groove.
- (2) Close the head, tighten the bolts to guard against distortion and protect the sealing surfaces from weld splatter. Ends of matching pipe or vessel must line up squarely with hub so that there is a uniform gap for welding.
- (3) Place several small tack welds around the closure hub at the point of attachment to the vessel. The number of tacks required to retain the hub in correct shape during welding operation will depend on the closure size, mounting position, etc.
- (4) Welding should be performed in accordance with the applicable code procedure. Care should be taken to keep weld metal deposition and associated heat input as low as practicable. Weld should have a uniform cross section throughout its circumference.

Gasket: Remove all foreign material from the O-ring groove and sealing surface before the gasket is installed. The O-ring should be coated with a suitable lubricant (Vaseline for ambient temperature service and silicone grease for higher temperatures) before it is placed in position. The O-ring gasket is intentionally smaller than the groove diameter and must be stretched to effect a "snap-fit" when properly positioned. Best installation practice is to insert the O-ring into the groove at locations 90° apart, then work the O-ring into the groove from these positions, taking care not to "roll" the O-ring. As mentioned above, do not install the O-ring until all welding on the closure is completed and the closure has cooled.

When they are used in the horizontal position, 22" and larger T-Bolt Closures must be prevented from sagging. If the vessel wall to which they are attached is equal to or greater than the following thicknesses-

22" thru 34" - 1/2"
36" thru 42" - 5/8"
over 42" - 3/4"

there should be no problem. However, if the vessel is lighter than above, a 1/2" x 3" wide reinforcing flange ring, rolled the hard way, should be installed around the closure hub below the hub nut mounts or adjacent to the weld joining the closure and vessel.

Operation

To close the T-bolt hinged closure, first inspect the O-ring and seating surface and remove any foreign material, then close the head. Bolts should be swung into place and tightened alternately in approximately three steps per bolt. Recommended torque for each bolt size is shown in the following table:

Bolt Size	Recommended Torque
1/2	20
5/8	40
3/4	65
7/8	100
1 - 1/8	225

WARNING: Do not attempt to open the closure until the pipe or vessel has been relieved of all internal pressure. Opening under pressure may result in injury to persons and damage to equipment.

To open the closure, relieve the internal pressure or vacuum in the pipe or vessel. Then, loosen the bolts by following a procedure the reverse of that described above for closing. However, do not swing the bolts loose from the head lugs until it is absolutely certain that no pressure or vacuum exists in the vessel or pipe. As loosening is continued, the presence or absence of pressure will become apparent and will indicate the safety with which opening can proceed.

Maintenance

Gasket: The O-ring should be inspected prior to every closing. Variations in service conditions will determine its useful life. Frequency of replacement will depend upon such factors as operating pressure and temperature, shrinkage and swelling caused by product absorption, the corrosiveness of the product in the system and frequency of operation.

The materials most often used for closure O-rings are discussed below. Technical information as to properties and usage of gasket materials are based on data and recommendations of the manufactures of the materials. Determination of the compatibility of the O-ring material is the responsibility of the purchaser.

The maximum temperatures are based on 100% compression set in 1000 hours. The O-rings may be used at higher temperatures but with an undetermined decreased life.

"Buna-N" - General service. Resistant to petroleum-base hydraulic and lubricating oils; animal and vegetable oils; gases such as butane, propane, acetylene and natural gas; aromatic and nonaromatic fuels such as gasoline, kerosene, diesel fuel and fuel oils; anhydrous ammonia and Water. Temperature limits -30 °F to 250 °F; special compounds suitable for -65 °F.

"Viton" - Generally used for high-temperature services. Resistant to synthetic lubricants, petroleum-base products, some chlorinated solvents, benzene, toluene, and many acids and alkalies. Temperature limits -20 °F to 400 °F.

"Ethylene Propylene" - Superior resistance to phosphate-ester type fluids, Skydrol, Pydrol, Cellulubes and glycol type coolants. Excellent resistance to mild acids and alkalies. Can be used in steam service. Replacing butyl rubber in most applications. Temperature limits -70 °F to 300 °F.

"Silicone Rubber" - Good resistance to high and low temperature dry gases, air, oxygen and ozone. May be satisfactory in high-aniline oils, but not recommended for use with most petroleum base products. Temperature limits -65 °F to 450 °F.

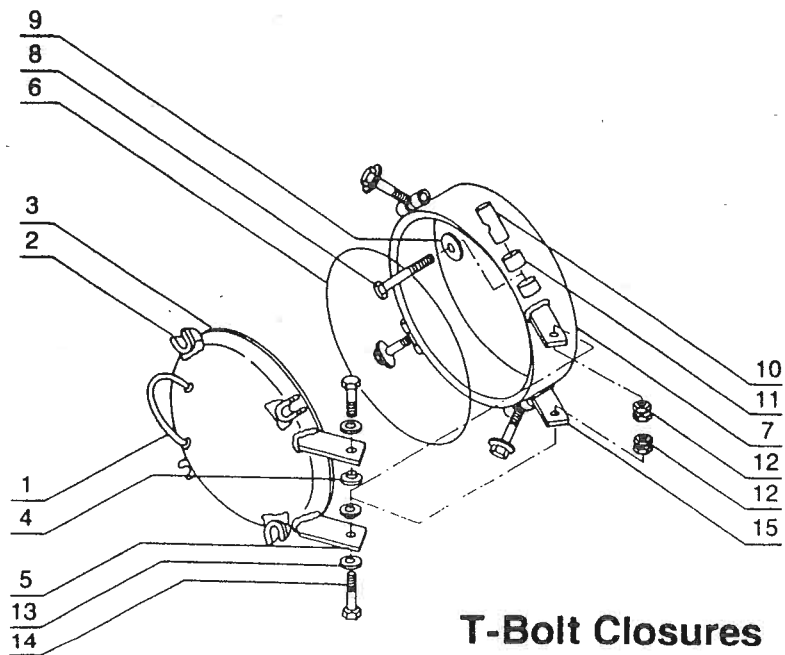
"Teflon" encapsulated O-rings with a core of Silicone or Viton are available for use with various chemicals. Temperature limits -65 °F to 400 °F for Silicone core and -20 °F to 400 °F for Viton core.

"PFA Teflon" encapsulated o-rings with a core of silicone are available for use with various chemicals. Temperature limits -65 °F to 500 °F.

Bolts: Lubricate the bolts periodically with a hydrocarbon-base lubricant in accordance with the frequency and severity of the service involved. Inspect the head bolts periodically for thread wear. Over-tightening can cause excessive thread wear and should be avoided.

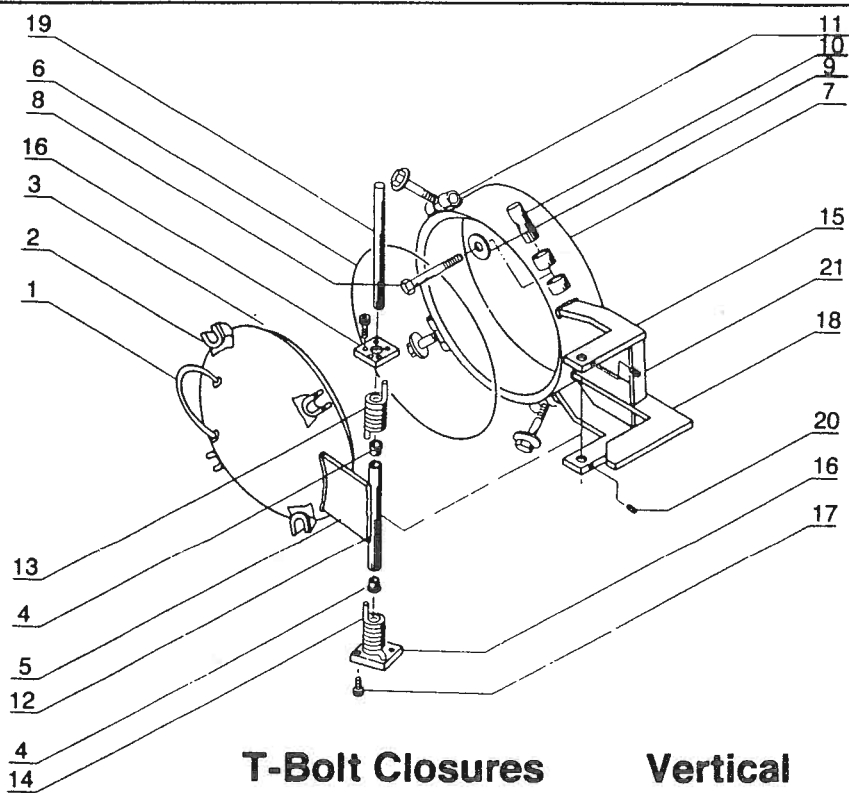
Paint: If the closure is to be painted, do so with the head in closed position to prevent paint from being applied to the seating surfaces. Paint on these surfaces may impede proper operation. It is recommended that the sealing surfaces and O-ring be coated with a grease, described above, before closing for painting. The bolt threads should not be painted.

Spare Parts: Stock two extra O-rings per closure for each individual closure. If several closures of the same size are installed close to one another, the number of extra O-rings may be reduced. Replacement bolts and swing nuts are readily available from Tube Turns Technologies, Inc.



T-Bolt Closures Parts List

1. Head Handle	5. Head Hinge Arms	9. Head Bolt Washer	13. Hinge Bolt Washer
2. Head Bolt Lug	6. O-ring	10. Tapped Swing Nut	14. Hinge Bolt
3. Head	7. Hub	11. Hub Nut Mounts	15. Hub Hinge Arms
4. Hinge Bushings	8. Head Bolt	12. Hinge Bolt Nut	



T-Bolt Closures Vertical Parts List

1. Head Handle	7. Hub	12. Hinge Tube	17. Lock Screw
2. Head Bolt Lug	8. Head Bolt	13. Spring (R.H.)	18. Head Stop
3. Head	9. Head Bolt Washer	14. Spring (L.H.)	19. Hinge Rod
4. Hinge Bushing	10. Tapped Swing Nut	15. Hub Hinge Arms	20. Hinge Rod Set Screw
5. Head Hinge Arm	11. Hub Nut Mounts	16. Adjusting Plate	21. Hinge Brace
6. O-ring			

Tube Turns Technologies, Inc.
 2900 W. Broadway
 P.O. Box 32160
 Louisville, Kentucky 40232-2160
 Telephone 502-774-6011
 Fax 502-774-6300
 E-Mail info@tubeturns.com



NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO



J-11 Manufacturers Catalog Data – Pressure Gauges

ASHCROFT®

Stainless Steel-Case Gauges Type 1008, Grade B (3-2-3%)

- 40mm and 50mm sizes
- All-stainless steel construction
- Dry or liquid-filled versions
- Lower or back connect
- Glass window standard
- Front flange or U-clamp available for flush mounting

Ashcroft® 40mm and 50mm all stainless steel pressure gauges help to complete our full-line product offering of stainless steel gauges with dial sizes from 40mm to 100mm. These smaller size gauges are used whenever space limitations and atmospheric and process corrosion exist. A typical application is on the input/output of regulators and transmitters.



SPECIFICATIONS

Dial size:	40mm (1½") and 50mm (2")
Accuracy:	Grade B (3-2-3%)
Optional:	Grade 1A (1%)
Case:	304 stainless steel with 304 stainless steel polished ring
Bourdon Tube and Socket:	316 stainless steel
Movement:	Stainless steel
Standard connections:	¼ NPT standard for 40mm, ¼ NPT standard for 50mm
Dial:	Aluminum, white background with black markings. Pressure range: Vac. through 5000 psi including compound
Pointer:	Aluminum
Window:	Glass

MODEL NO. 1008

Pressure Ranges – Single Scale

psi	kg/cm ²	kPa
0/15	0-1	0-100
0/30	0-2	0-200
0/60	0-2.5	0-250
0/100	0-4	0-400
0/160	0-6	0-600
0/200	0-10	0-1000
0/300	0-16	0-2000
0/400	0-25	0-2500
0/600	0-40	0-4000
0/800	0-60	0-6000
0/1000	0-100	0-10,000
0/1500	0-160	0-20,000
0/2000	0-250	0-25,000
0/3000		
0/5000		

Compound Ranges – Single Scale

psi	kg/cm ²	kPa
30" Hg/15 psi	-1/0/1	-100/0/100
30" Hg/30 psi	-1/0/3	-100/0/300
30" Hg/60 psi	-1/0/5	-100/0/500
30" Hg/100 psi	-1/0/9	-100/0/900
30" Hg/150 psi	-1/0/15	-100/0/1500
30" Hg/300 psi	-1/0/25	-100/0/2500

Vacuum Ranges – Single Scale

psi	kg/cm ²
30/0 inHg	-1/0

TO ORDER THIS 1008 PRESSURE GAUGE:

Select:	40	1008	S	01L	1000 psi
1. Dial size—40mm or 50mm	_____	_____	_____	_____	_____
2. Case type—1008	_____	_____	_____	_____	_____
3. Tube and socket material	_____	_____	_____	_____	_____
4. Connection size—¼ (01), ¼ (02)	_____	_____	_____	_____	_____
5. Connection location—Lower (L), Back (B)	_____	_____	_____	_____	_____
6. Standard pressure range—1000 psi	_____	_____	_____	_____	_____



J-12 Manufacturers Catalog Data – Pig Signals

ENDURO Pig Popper®
Model: PPM

Operating Instructions



ENDURO

Pipeline Services, Inc.

P.O. Box 3489 Tulsa, Oklahoma 74101-3489

Phone: (918) 446-1934 (800) 752-1628 Fax: (918) 446-8125

www.enduropls.com

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Introduction

ENDURO Pig Popper® Model: PPM

Welcome to a new ease in pig signal devices and say good-bye to headaches of the past. Enduro has, like most pipeliners, dealt with, cussed at and suffered from trying to use pig signal devices that simply did not work.

The *ENDURO* Pig Popper® Model PPM is designed with all of us in mind;

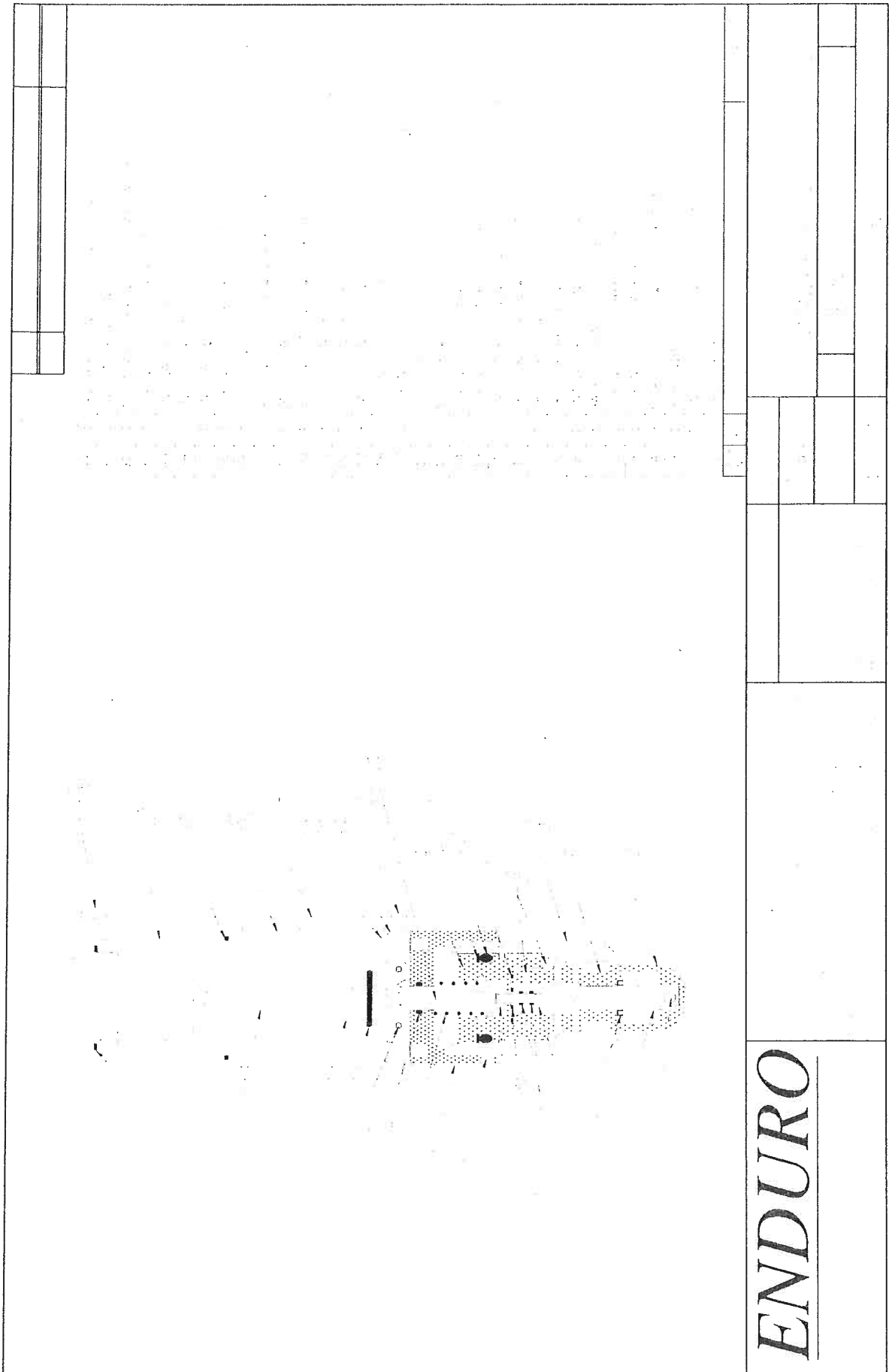
It Works!

Benefits:

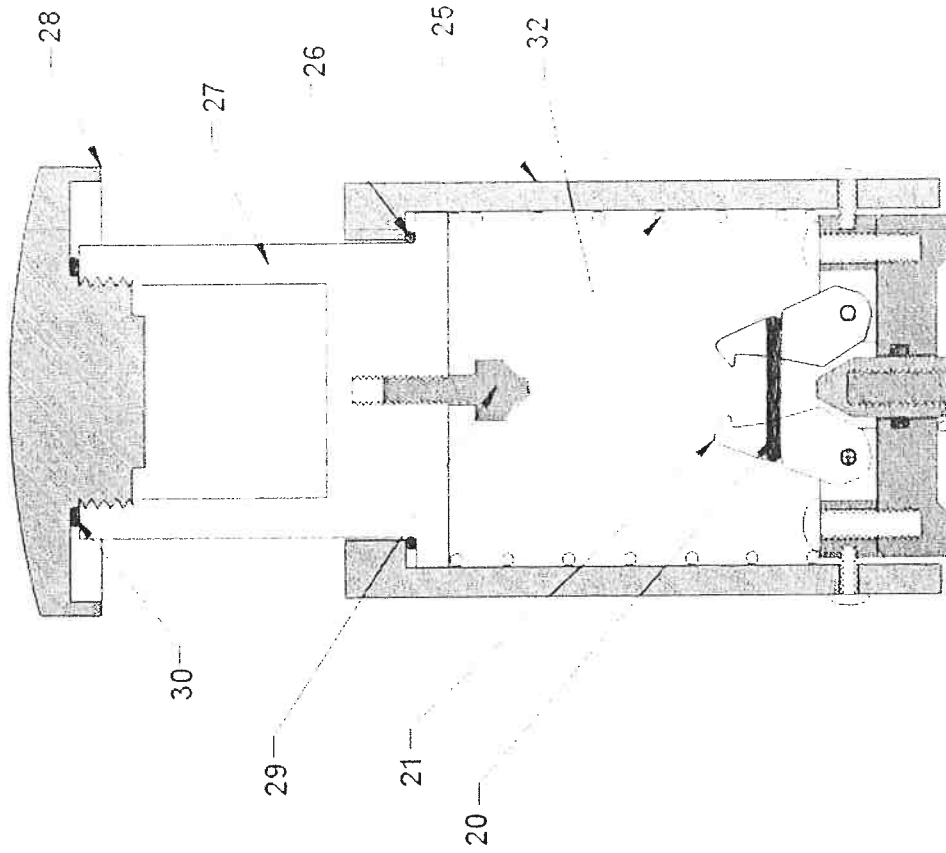
- ? Stainless Steel inner construction.
- ? Ease of installation.
- ? Replaces many older models on the existing fitting.
- ? Absolutely no doubt observation of pig arrival.
- ? Easy to reset and know it is reset.
- ? Bi-Directional in operation

**5 year Guarantee on all Enduro parts and operation.
1 year on O-ring seal from manufacturer**



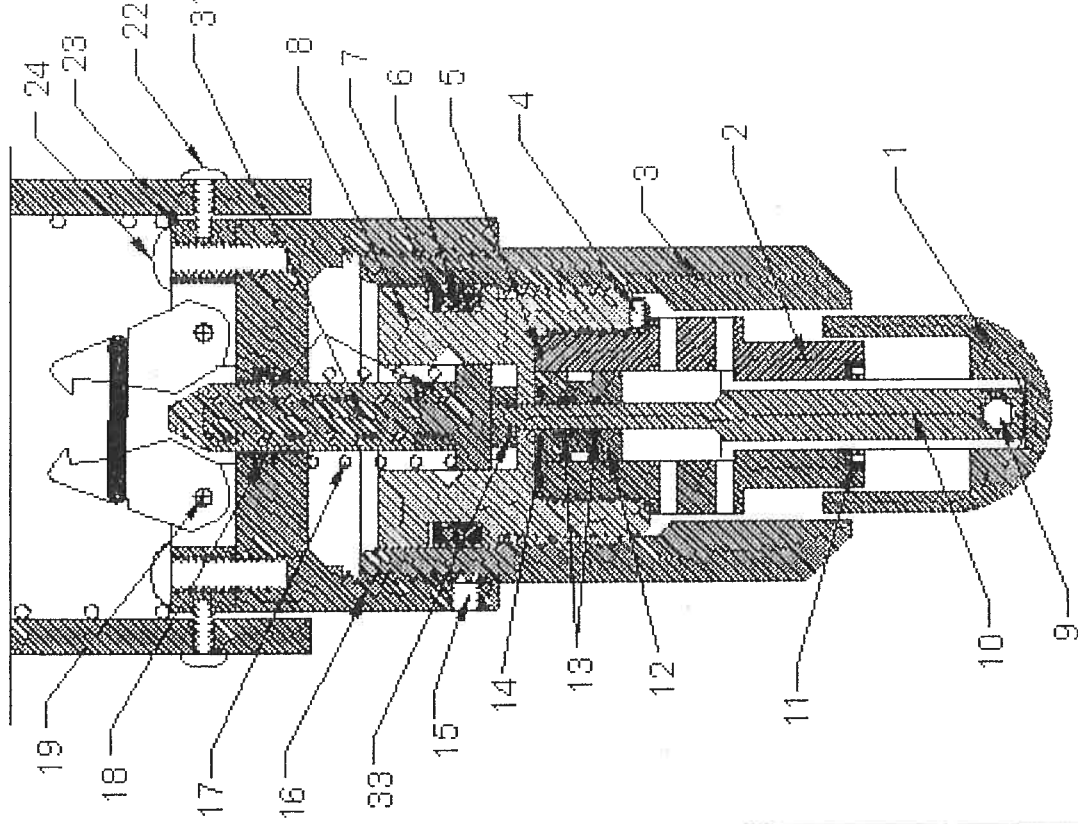


ENDURO



Item No.	Description	Part / Dwg. No.	Qty.
20	Catch Finger Spring	STD.	1
21	Button Head Screw	PP.0000.8008.02	3
25	Dust Cover	PP.0000.8010.07	1
26	O-Ring (Parker 2-142)	STD.	1
27	Indicator	PP.0000.8011.07	1
28	Indicator Cap	PP.0000.8012.07	1
29	Indicator Lock Pin	PP.0000.8013.02	1
30	O-Ring (Parker 2-136)	STD.	1
32	Indicator Spring	PPP.0000.9006.02	1

Item No.	Description	Part/ Dwg. No.	Qty.
1	Trigger Ball	PP.0000.8001.02	1
2	Indicator Housing—Bottom	PP.0000.8002.02	1
3	Pipe Nipple	STD.	1
4	Socket Set Screw 6/32 x 1/4	STD.	1
5	O-Ring (Parker 2-020)	STD.	1
6	O-Ring (Parker 2-325)	STD.	1
7	Back-up Ring (Parker 2-325)	STD.	1
8	Indicator Housing—Upper	PP.0000.8003.02	1
9	Trigger Ball Pin	PP.0000.8004.02	1
10	Trigger Plunger	PP.0000.8005.02	1
11	Trigger Plunger Wiper (National 340847)	STD.	1
12	Indicator Housing Insert	PP.0000.8006.02	1
13	O-Ring (Parker 2-008)	STD.	2
14	O-Ring (Parker 2-0110)	STD.	1
15	Set Screw	STD.	1
16	Pipe Cap	PP.0000.8007.02	1
17	Spring	SPEC. PRESSURE	1
18	O-Ring (Parker 2-112)	STD.	1
19	Catch Finger Pin	STD.	3
22	Button Head Screw 1- x 24	STD.	4
23	Catch Plate	PP.0000.8009.02	1
24	Button Head Screw	STD.	2
31	Adjustable Spring Guide Assembly	PP.0000.9006.02	1
33	Trigger Plunger Retention Nut	STD.	1



TEST LOG

ENDURO Pig Popper® Model: PPM

Enduro has designed and built a test vessel especially for the testing of our pig signal devices. The vessel presently test our Pig Popper® model: PPM units at pressure from 0 to 2,100 psi. A pneumatic plunger resets the pig signal each time a pig simulator passes and triggers the pig signal probe.

The following charts indicate the number of cycles (pig passes) and the operating pressure maintained during the specific testing.

The life of the Pig Popper® test is the additive cycle period of each test combined.

The mechanical testing of the Pig Popper® is equivalent to approximately 18 years with no failure.

2 Year Test 400 PSI	<u>PRESSURE</u>	<u>CYCLES</u>	<u>MEDIA</u>
	400 PSI	0	WATER
	400 PSI	750	WATER
3.2 Year Test 500 PSI	<u>PRESSURE</u>	<u>CYCLES</u>	<u>MEDIA</u>
	500 PSI	0	WATER
	500 PSI	1,165	WATER
5 Year Test 1000 PSI	<u>PRESSURE</u>	<u>CYCLES</u>	<u>MEDIA</u>
	1000 PSI	0	WATER
	1000 PSI	1,850	WATER
3.7 Year Test 1500 PSI	<u>PRESSURE</u>	<u>CYCLES</u>	<u>MEDIA</u>
	1500 PSI	0	WATER
	1500 PSI	1,360	WATER
4 Year Test 2100 PSI	<u>PRESSURE</u>	<u>CYCLES</u>	<u>MEDIA</u>
	2100 PSI	0	WATER
	2100 PSI	1,480	WATER

- Terminated test after **6,600 cycles** with a full range of psi levels having been met.
- Simulate pig passage in test vessel with mechanical pig passage and pneumatic reset.
- Further testing of the Pig Popper® is constantly taking place.
- To date the unit has exceeded all expectations and has proven sound engineering and material selections.
- Additional models, such as a lighted version are available and control panel electrical units will soon be available.

Specifications



ENDURO Pig Popper® Model: PPM

Materials:

Upper Housing	Urethane, Black
Housing Cap	Urethane, Black
Indicator	Urethane, Yellow
Catch Plate	Stainless, 316
Catch Fingers	Stainless, 304
Standard Pipe Nipple	Mild Steel

ENDURO Pig Popper®

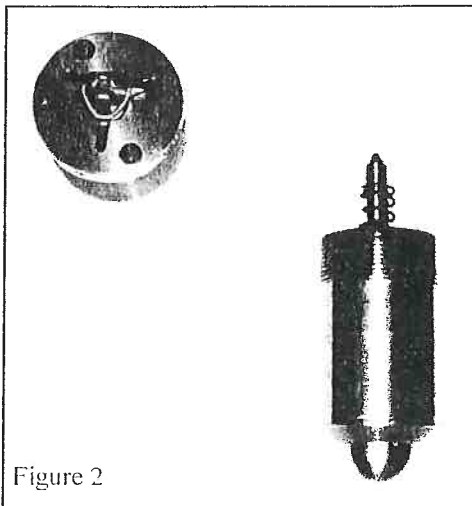
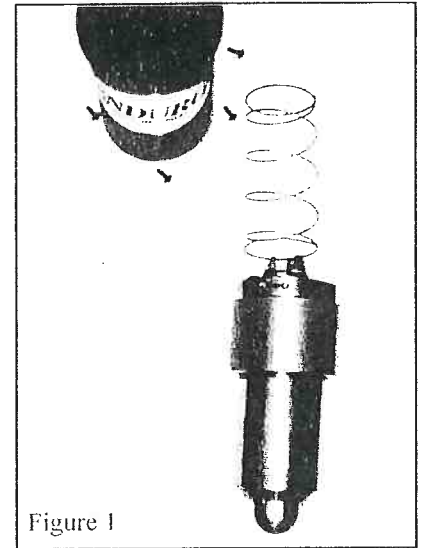
Model: PPM

Installation Instructions

The ENDURO Pig Popper® Model: PPM is shipped from the factory completely assembled.

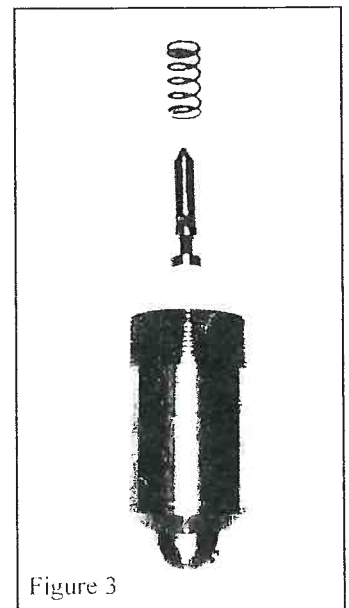
PRIOR TO WELDING

1. Remove indicator dust cover and cap assembly from pipe cap and catch plate assembly, by removing the four 10x24 button head allen screws with a 1/8 inch allen wrench. Remove indicator spring and set parts aside. (Figure 1)

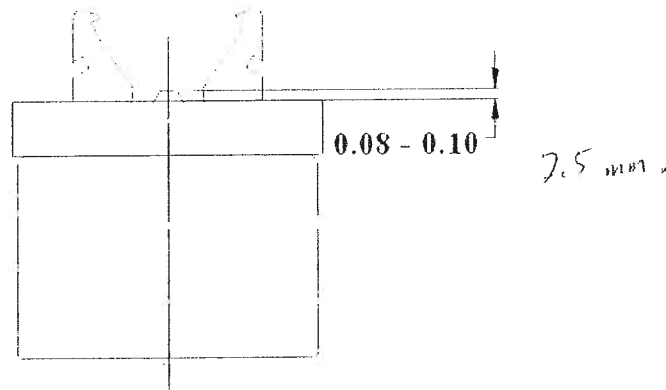


2. Loosen the set screw and remove pipe cap and catch plate assembly from the pipe nipple by unscrewing the assembly counter clockwise. (Figure 2)

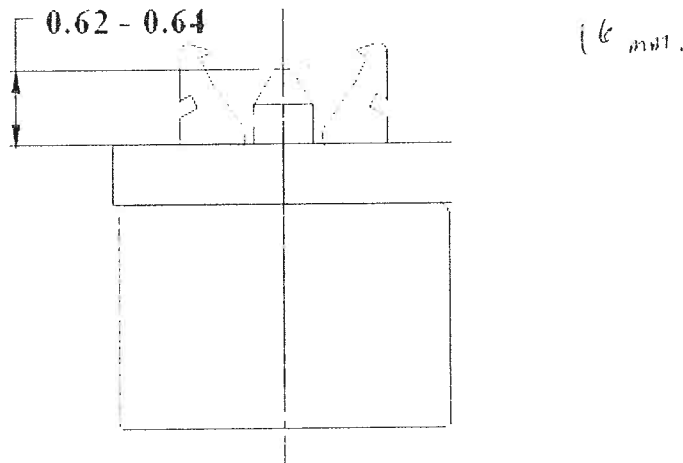
3. Remove the small spring from the adjustable spring guide assembly. At this point, adjustments to the adjustable spring guide will be made. (Figure 3)



4. With the adjustable spring guide in place, re-install the pipe cap and catch plate assembly, and tighten all the way to the final tightened position. Count the number of turns and mark this position on the pipe cap and body of the pipe nipple. It will be necessary to return to this position later.
5. Remove the garter spring from the three catch fingers on the catch plate, being careful not to over stretch the spring.
6. The adjustable spring guide should now be protruding through the top of the catch plate. This protrusion should be as follows:
 - A) With the pig popper in a non-tripped position, and the adjustable spring guide pushed all the way down, the protrusion should be between .080 to .100 inches above the catch plate.



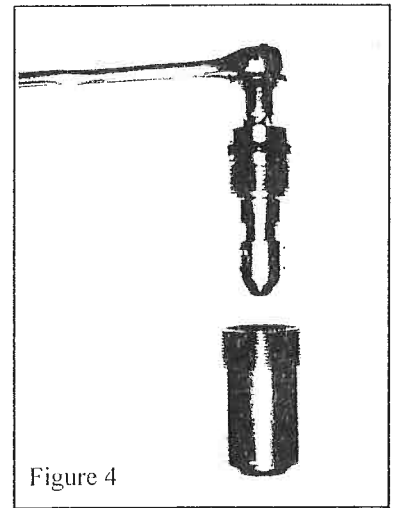
- B) With the pig popper in the tripped position, and the adjustable spring guide all the way up, the protrusion should be .620 to .640 inches above the catch plate.



7. Make any length adjustments to the spring guide by screwing the upper body of the guide up or down. Be sure to secure any adjustment change by tightening the jam nut using a 7/16 inch and 1/2 inch wrench.

Note: *It may take more than one try at adjusting the spring guide; however this measurement is critical for proper operation. Be sure to tighten the cap to the same place every time an adjustment is made.*

8. After the adjustments are made, remove the catch plate/pipe cap assembly.
9. Install the garter spring over the three (3) catch fingers, that are attached to the catch plate, and into the notch in the back of each finger. Be careful not to over stretch the spring.
10. Remove the adjustable spring guide.
11. Remove the pig popper housing and trigger ball assembly from the pipe nipple using a $\frac{1}{2}$ in drive socket wrench and the provided $\frac{1}{2}$ inch to $\frac{3}{4}$ inch adapter. (Figure 4)
12. Mask off the internal and external threads and O-Ring grooves on the pipe nipple to protect against weld splatter.



INSTALLATION OF PIG POPPER®

The pig popper assembly can be installed in any location around the pipe, perpendicular to the centerline.

WELDING CODES

- | | |
|------------|--|
| ASME B31.4 | For liquid transportation systems for hydrocarbon, liquid petroleum gas, anhydrous ammonia, and alcohol. |
| ASME B31.8 | For gas transmission and distribution piping systems. |

WELDING - NEW CONSTRUCTION

ATTACH INDICATOR NIPPLE TO PIPELINE IN ACCORDANCE WITH PIPELINE COMPANY'S WELDING SPECIFICATIONS IN THE FOLLOWING SEQUENCE.

1. At the point of installation, drill pipe for indicator protrusion into the pipeline, by using a 1-7/16 inch diameter drill bit.
2. Remove all drill shavings or slag from edge of the hole.
3. Make certain that all threads and O-Ring surface are protected from weld splatter and other physical damage.

4. Level indicator nipple with line pipe and weld in accordance with the appropriate welding codes.
5. Upon completion of the welding allow base to cool to touch then remove all of the masking materials.

WELDING - PIPELINE IN SERVICE

ATTACH INDICATOR NIPPLE TO PIPELINE IN ACCORDANCE WITH PIPELINE COMPANY'S WELDING SPECIFICATIONS IN THE FOLLOWING SEQUENCE.

1. Make certain that all threads and O-ring surfaces are protected from weld splatter and other physical damage.
2. Level indicator nipple with the line pipe and weld in accordance with the appropriate welding codes.
3. Upon completion of the welding, allow the base to cool to the touch, and then remove all the masking material.

TAPPING PIPELINE

When tapping a line that is in service, refer to the tapping machine manufactures procedure for hot tapping and setting the Pig Popper® housing.

INSTALLATION OF PLUG IN EXISTING NIPPLE

Before installing an Enduro Pig Popper® housing and trigger ball into an existing pipe nipple, verify with the factory that the housing is compatible to use with the nipple.

Refer to the manufacturer of the tapping and plugging machines instructions for proper procedure for removing and installing a new housing.

RE-ASSEMBLY

1. Apply grease to the Pig Popper® housing O-Rings, and thread the housing/trigger ball assembly, into the pipe nipple until it seats, using a tapping machine.

Note: *When using a tapping machine to set the Pig Popper® housing assembly, be sure to following the manufacturers installation instructions.*

2. Apply grease to the top portion of the adjustable spring guide, and place back on top of Pig Popper® housing. Slide the spring back over the adjustable spring guide.
3. Next replace the catch plate/pipe cap assembly, onto the pipe nipple with the adjustable spring guide protruding through the cap and catch plate.

Note: *Some down pressure may have to be applied to catch plate/pipe cap assembly to get it to start onto the pipe nipple.*

4. Tighten catch plate/pipe cap assembly to the same position it was in while adjustments were being made to the adjustable plunger.

Note: *Any more or less tightening to the cap at this point could cause the pig popper to not release, or may cause it to release prematurely and readjustment would be necessary.*

5. Tighten set screw in the side of the pipe cap, thus locking the cap in place.
6. Install the indicator spring on top of the catch plate, then install the dust cover/cap assembly over the indicator spring, using the four (4) 10 x 24 button head allen screws.
7. The unit is now ready to be placed into service. To set unit, push down on the dust cover cap until a click is both heard and felt.

Warranty

Enduro Pipeline Services, Inc. warrants its products for parts and labor for

**5 year Guarantee on all Enduro parts/operation
and
1 year on o-ring seal from manufacturer**

This covers normal use of the equipment only. Any use other than that intended, misuse, abuse, or customer modification will void this warranty. Enduro at its option, will repair or replace equipment failed because of defects in either workmanship or parts. Under no circumstances will Enduro be responsible for any incidental damage or expense resulting from the use of the equipment covered by this warranty.

Specific Exclusions

The following events specifically void the warranty.

1. Immersion in water or other liquids.
2. Service by unauthorized persons.

Enduro Pipeline Services, Inc.
5000 South 45th West Ave.
Tulsa, Oklahoma 74107
(918) 446-1934 (800) 752-1628



J-13 Manufacturers Catalog Data - Coating



ICI Devoe Coatings is a member of the ICI Paints World Group

BAR-RUST™ 235

Multi-Purpose Epoxy Coating

Cat. # 235KXXXX

PRODUCT DESCRIPTION

Generic: Advanced Technology Epoxy

General Description: A high performance, multi-purpose, surface tolerant, two-component chemically-cured epoxy semi-gloss coating.

Typical Uses: For use on properly prepared steel or masonry surfaces including immersion (non-potable water) service. Also for concrete floors, interior primed drywall, plaster, and wood surfaces. Ideal for structural steel, piping, storage tanks, machinery, and equipment in petroleum refineries, pulp and paper mills, chemical and fertilizer plants, and sewage treatment plants. Can also be used in the hard service areas of food processing plants, dairies, schools, restaurants, and general industrial buildings & structures.

Special Qualifications: Performance alternate for Federal Specifications TT-C-550 and TT-C-545, Mil-P-24441-Type I & II, Mil-C-22750D-Type I, and Mil-P-23377E-Type I, Mil-P-23236B-Type I & IV, Class 2, and Mil-P-24647B. Meets AWWA D102.

Suitable for use on structural surfaces or surfaces where there is a possibility of incidental food contact in commercial food preparation establishments, food processing plants and federally inspected meat and poultry plants. USDA no longer requires or furnishes product certification letters.

FEATURES

Advantages:

- Exceptional corrosion protection
- Suitable for salt & fresh water immersion
- Low temperature cure to 0°F (-18°C)
- Surface tolerant – abrasive blasting not required in most applications
- Excellent adhesion to tight rust
- Good adhesion to damp surfaces
- Self-priming for steel & masonry substrates
- Abrasion & chemical resistance is excellent
- High solids – high film build
- Low VOC

Limitations of Use: Exterior exposure will cause a color change, early dulling, and loss of gloss, but this does not affect protective properties. Epoxy coatings may yellow during application and cure if exposed to the combustion by-products of improperly vented fossil fuel burning heaters. Commonly finished with ICI Devoe Coatings DEVTHANE™ Urethane Enamel for maximum exterior color & gloss retention. Do not use for fuel or solvent immersion.

SPECIFICATION DATA

Color: Off White, ready-mixed and custom colors

Finish: Semi-Gloss

Reduction Solvent: T-10 Thinner. For application over aged alkyds use T-5 Thinner or Xylene.

Clean-up Solvent: T-10 Thinner

Weight/Gallon: 11.0 lbs./gal. (1.3 kg/L) – varies with color

VOC (EPA 24): 2.40 lbs./gal. (292 g/L) – varies with color

Solids By Volume (ASTM D 2697 – 7 days): 68%

Theoretical Coverage at 1.0 Mil (25 microns) Dry: 1091 sq. ft./gal. (28.0 m²/L)

Recommended Film Thickness: 4.0-8.0 mils (100-200 microns) dry – 5.9-11.7 mils (147-293 microns) wet. (Make allowances for loss due to overspray & irregular surfaces.)

Systems: Please consult the appropriate system guide, the particular job specification or your ICI Devoe Coatings' Industrial Coatings Specialist for proper systems using this product. Systems must be selected considering the particular environment involved.

Service Temperature Limits: 250°F (121°C) dry

Minimum Dry Time (ASTM D 1640): At 5 mils (125 microns) DFT

Substrate Temperature	20°F (-7°C)	40°F (4°C)	60°F (16°C)	80°F (27°C)
Minimum Recoat	28 Hours	11 Hours	6 Hours	3 Hours
Dry Hard	46 Hours	18 Hours	9 Hours	5 Hours
Maximum Recoat				
Self Devthane Urethane 229H	30 Days 7 Days 7 Days	30 Days 6 Days 6 Days	30 Days 5 Days 5 Days	30 Days 5 Days 5 Days

Warning: The above table provides general guidelines only. Always consult your ICI Devoe Coatings Specialist for appropriate recoat windows since the maximum aged recoat time of this product may be significantly shortened or lengthened by a variety of conditions, including, but not limited to humidity, surface temperature, and the use of additives or thinners. The use of accelerators or force curing may shorten the aged recoat of individual coatings. The above recoat windows may not apply if recoating with a product other than those listed above. If the maximum aged recoat window is exceeded, please consult your ICI Industrial Coatings Specialist for appropriate recommendations to enhance adhesion. Failure to observe these precautions may result in intercoat delamination.

Shelf Life: Over 24 months at 77°F (25°C) – unopened

Hardness (ASTM D 3363, 7 day cure @ 77°F (25°C): 3H

Mix Ratio By Volume: 4(base):1(converter) – see mixing instructions.

Induction: 15 minutes @ 77°F (25°C) – see mixing instructions.

Pot Life: 4.5 hours @ 77°F (25°C) & 50% R.H.

PERFORMANCE DATA

Adhesion: (ASTM D 4541) – Excellent

Salt Spray Resistance: (ASTM B 117) – Excellent

Direct Impact Resistance: (ASTM D 2794) – Very Good

Abrasion Resistance: (ASTM D 4060) – Excellent

Humidity Resistance: (ASTM D 2247) – Excellent

Water Immersion: (ASTM D 1308) – Excellent

Chemical Resistance: (ASTM D 1308 – 24 hr. contact) Excellent. Resists splash and spillage of alkalis, salts, moisture, oils, greases, foodstuffs and detergents, 50% Sodium Hydroxide, 28% Ammonia, 5% Trisodium Phosphate, 25% Citric Acid, 25% Lactic Acid, 10% Sulfuric Acid, Crude Oil, 10% Hydrochloric Acid, 20% Tannic Acid, 5% Sodium Chloride, 10% Ammonium Hydroxide, sewage.

DANGER! COMBUSTIBLE. HARMFUL OR FATAL IF SWALLOWED. Read Label and Material Safety Data Sheet Prior to Use. See other cautions on last page. DSF2-0790

FINISHES
SPECIAL COATINGS (9800)

ICI DEVOE COATINGS
A member of the ICI Paints World Group



A member of the ICI Paints World Group

FINISHES
SPECIAL COATINGS (9800)

GENERAL SURFACE PREPARATION

Surfaces must be dry, clean, free of oil, grease, form release agents, curing compounds, laitance, other foreign matter and be structurally sound. Remove all loose paint, mortar spatter, mill scale, and rust. All direct to metal coatings provide maximum performance over blasted surfaces. There are situations and cost limitations which preclude blasting. BAR-RUST 235 was designed to provide excellent protection over less than ideal surface preparation. The minimum standard for non-immersion service is SSPC-SP2 (SSI-St2); for immersion service the minimum standard is SSPC-SP3 (SSI-St3). **These minimum surface preparation standards apply to steel that has been previously abrasive blasted, coated and deteriorated.** Where very rusty surfaces still remain after cleaning use PRE-PRIME 167™ Sealer before application of BAR-RUST 235 Coating.

New Surfaces: Steel – New steel surfaces should be initially blasted to near-white metal surface cleanliness in accordance with SSPC-SP10 or SSI-Sa2 1/2 for immersion service or commercial blast cleanliness in accordance with SSPC-SP6 or SSI-Sa2 for non-immersion service. Blast profile on steel should be 1 1/2 to 2 1/2 mils (38-63 microns) in depth and be of a sharp, jagged nature as opposed to a "peen" pattern (from shot blasting). **Concrete Block** – Remove loose aggregate and repair

voids. Fill with this product, Tru-Glaze® 4010 or DEVRAN® 265BHF. **Concrete Floors, Poured Concrete** – Cure at least 30 days. Acid etch or abrasive blast slick, glazed concrete or concrete with laitance. Prime with PRE-PRIME 167 or this coating thinned with T-10 Thinner in a 4 to 1 ratio. **Drywall** – Prime with a premium acrylic latex vapor barrier primer sealer. **Interior Wood** – Prime with this product thinned 10% with T-10 Thinner. **Exterior Wood** – Not recommended over this surface. **Galvanized Steel** – Remove dirt and oils by solvent cleaning or with DEVPREP® 88 Cleaner followed by a thorough water rinsing. Prime with DEVRAN 205 Epoxy Primer for non-immersion. For immersion or severe moisture condition, abrasive blasting is recommended before priming with DEVRAN 201 Epoxy Primer.

Previously Painted Surfaces: Old coatings should be tested for lifting. If lifting occurs, remove the lifted coating. Otherwise scuff sand glossy areas and aged epoxy coatings. Clean aged epoxy or urethane coatings with DEVPREP 88 Cleaner. Remove cracked and peeling paint. Prime bare areas with primer specified under **New Surfaces**. If thinning is required, thin with T-5 Thinner or Xylene only when used over aged alkyd coatings.

DIRECTIONS FOR USE

Tinting: Tint only with CHROMA-CHEM 844 colorants. (Do not use water based colorants). Add colorants to only the base portion. Mix thoroughly before adding the Converter portion.

Thinning: Thinning is not normally required or desired. However, at extreme environmental conditions, small amounts (10% or less by volume) of the solvents on the reverse page can be added depending on local VOC and air quality regulations. When using BAR-RUST 235 over aged alkyds, use Devco Coatings T-5 Thinner. Any solvent addition should be made after the two components are thoroughly mixed.

Mixing: BAR-RUST 235 Coating is a two component product supplied in 5 gallon and 1 gallon kits which contain the proper ratio of ingredients. The entire contents of each container must be mixed together. Power mix the base portion first to obtain a smooth, homogeneous condition. After mixing the base portion, add the converter slowly with continued agitation. After the converter add is complete, continue to mix slowly. Allow the mixed material to stand 15 minutes at 60-80°F (16-27°C) before use. Always restir before use. Mixed material is usable for 4.5 hours; if it thickens, do not add thinner, but discard and mix fresh material. Higher temperatures will reduce working life of the coating; as temperatures will increase it. Surfaces coated with this product may become slippery when wet. For additional slip resistance in areas of pedestrian traffic, add one pound per gallon of coarse pumice or other texturing material.

Application: Spray is preferred for appearance and film build control. For air spray application, use a "Mastic" gun, a fluid tip of .070" or larger and an air cap with good break-up. The fluid pressure should be kept low, with just enough air pressure to get good break-up of the coating. Excessive air pressure can cause overspray problems. Where airless equipment is used, an airless

spray pump capable of 3,000 psi (207 bars) and .021" to .025" tip size will provide a good spray pattern. Ideally, fluid hoses should not be less than 3/8" ID and not longer than 50 feet to obtain optimum results. Longer hose length may require an increase in pump capacity, pressure, and/or thinning. Viscosity control best achieved using in-line heaters. BAR-RUST 235 Coating may also be applied by brush or roller. Care should be taken that proper and uniform thicknesses are obtained. For roller work use a clean synthetic roller with 1/4"-1/2" nap. New rollers should be thoroughly wet with the specified thinner and spun vigorously to remove loose fibers. Brushing and rolling may require multiple coats to achieve correct film thickness and/or hiding.

Spreading Rate: Apply at 130-250 sq.ft. per gallon (3-6m²/L) depending on surface texture and porosity. Make allowance for any losses due to overspray or surface irregularities.

Ventilation: It is very important for the safety of the applicator and the proper performance of the BAR-RUST 235 Coating that good ventilation with dry, fresh air be provided in enclosed areas to remove all solvent vapors. Since all solvent vapors are heavier than air, ventilation ducts should reach to the lowest portions of the enclosed areas as well as into any structural pockets. Ventilation should be provided throughout the cure period.

Topcoats: Can be used as a finish for interior areas. Accepts a variety of topcoats. In interior or exterior areas, DEVTHANE™ Urethane Enamels could be used as a finish to enhance performance and/or appearance.

Dry Time: At 70°F (21°C) & 50% R.H., dries to recoat with epoxy or urethane in 5 hours and hard in 7 hours.

Clean-up: Use T-10 Thinner.

PRECAUTIONS

DANGER! COMBUSTIBLE LIQUID AND VAPOR. CAUSES EYE AND SKIN BURNS. HARMFUL OR FATAL IF SWALLOWED. ASPIRATION HAZARD - CAN ENTER LUNGS AND CAUSE DAMAGE. HARMFUL IF INHALED. MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS, INCLUDING DIZZINESS, HEADACHE OR NAUSEA. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN AND RESPIRATORY REACTION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. OVEREXPOSURE MAY CAUSE BLOOD, LIVER, KIDNEY DAMAGE. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE LUNG CANCER AND OTHER LUNG DAMAGE IF INHALED. CONTAINS MICA WHICH MAY CAUSE PNEUMOCONIOSIS. USE ONLY WITH ADEQUATE VENTILATION. KEEP OUT OF THE REACH OF CHILDREN.

NOTICE: Products in this series may contain solvents. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. For emergency information call (800) 545-2643. For additional safety information, refer to the Material Safety Data Sheet for this product. Keep away from heat, sparks and flame. **Do not smoke.** Vapors may ignite. Extinguish all flames, burners, stoves, heaters and pilot lights and disconnect all electrical motors and appliances before use and until all vapors are gone. If sanding is done, wear a dust mask to avoid breathing of sanding dust. Do not breathe vapors or spray mist. If you experience eye watering, headaches, or dizziness, leave the area. If properly used, a respirator may offer additional protection. Obtain professional advice before using. Close container after each use. **FIRST AID:** In case of skin contact, wash off **quickly** with plenty of soap and water, remove contaminated clothing. For eye contact flush **immediately** with large amounts of water, for at least 15 minutes. **Obtain emergency medical treatment.** If swallowed, **obtain medical treatment immediately.** If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs, **get medical help.** **Note: These warnings encompass the product series. Prior to use, read and follow product specific MSDS and label information.**

DS238-0999

SHIPPING

Freight Classification:	Paint		
Flash point:	100°F (38°C)		
Packaging:	1 gallon kit (3.785L)	5 gallon kit (18.925L)	
	0.80 gallon base	4.00 gallon base	
	0.20 gallon converter	1.00 gallon converter	

Shipping Weight:	4 - 1 gallon kits - 45 lbs. (20.4 kg)
	5 gallon kit - 56 lbs. (25.4 kg)

235KXXXX (3/00)
Ad Stock #68637D



Cleveland,
Ohio, U.S.A.
800-654-2616
www.devoecoatings.com

ICI Devco Coatings is a member of the ICI Paints World Group

LIMITATION OF LIABILITY: To the best of our knowledge, the technical data contained herein are true and accurate at the date of issuance but are subject to change without prior notice. We guarantee our product to conform to the specifications contained herein. **WE MAKE NO OTHER WARRANTY OR GUARANTEE OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE.** Liability, if any, is limited to replacement of the product or refund of the purchase price. **LABOR OR COST OF LABOR AND OTHER CONSEQUENTIAL DAMAGES ARE HEREBY EXCLUDED.**



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DEVTHANE™ 379UVA

Aliphatic Urethane Gloss Enamel (White, Ready-Mixed & Custom Colors)

Cat. # 379KXXXX

PRODUCT DESCRIPTION

Generic: Aliphatic Acrylic Urethane

General Description: A high performance, two-component chemically-cured aliphatic urethane gloss enamel for use in areas where maximum gloss & color retention are required.

Typical Uses: For use on properly prepared and primed steel, concrete or steel floors, masonry, drywall, plaster, metal, concrete block, galvanized, aluminum, poured concrete, and glazed brick. Ideal for use on exterior or interior structural steel, piping, metal buildings, control cabinetry, conveyors, pumps, storage tanks, motors, machinery, and transportation vehicles. Can also be used in the hard service areas of food processing plants, dairies, schools, restaurants, hospitals, correctional facilities, factories, stadiums, arenas, and amusement parks.

Special Qualifications: Suitable for use on structural surfaces or surfaces where there is a possibility of incidental food contact in commercial food preparation establishments, food processing plants and federally inspected meat and poultry plants. USDA no longer requires or furnishes product certification letters.

FEATURES

Advantages:

- Exceptional gloss and color retention
- Excellent abrasion and chemical resistance
- Higher solids and higher film build than typical urethane finishes
- VOC Compliant Urethane
- Easily applied by brush, roller or spray
- Wide color selection, including safety colors
- Excellent resistance to marring, chipping, and scratching
- Performance alternate for Devthane 369 and 4708
- Contains ultraviolet light absorber

Graffiti Resistance:

Excellent resistance to most graffiti materials such as spray paint, magic markers and lipstick. Contact your ICI Devoe Coatings representative for more information on Devclean™ 99 Graffiti Cleaner.

Limitations of Use: Color may change as temperature approaches 250°F (121°C) limit, but the film will remain intact.

SPECIFICATION DATA

Color: White (tintable), ready-mixed & custom colors

Finish: Gloss (90 units @ 60°)

Reduction Solvent: T-9 for spray, T-17 for brush or roller

Clean-up Solvent: T-9 Thinner

Weight/Gallon: 11.0 lbs./gal. (1.32 kg/L) – varies with color

VOC (EPA 24): 2.60 lbs./gal. (311 g/L) – varies with color

Solids By Volume (ASTM 2697-7 days): 63%

Theoretical Coverage at 1.0 Mil (25 microns) Dry: 1011 sq. ft./gal. (24.9 m²/L)

Recommended Film Thickness: 2.0-3.0 mils (50-75 microns) dry – 3.2-4.8 mils (80-120 microns) wet

Systems: Please consult the appropriate system guide, the particular job specification or your ICI Devoe Coatings' Industrial Coatings Specialist for proper systems using this product. Systems must be selected considering the particular environment involved.

Service Temperature Limits: 250°F (121°C) dry

Minimum Dry Time (ASTM D 1640): 2 mils (50 microns) DFT

Substrate Temperature	40°F (4°C)	60°F (16°C)	80°F (27°C)
Minimum Recoat	10 Hours	6 Hours	3 Hours
Dry Hard	>32 Hours	24 Hours	16 Hours
Maximum Recoat			
Self	2 Weeks	2 Weeks	2 Weeks

Warning: The above table provides guidelines only. Always consult your ICI Devoe Coatings Specialist for appropriate recoat windows since the maximum aged recoat time of this product may be significantly shortened or lengthened by a variety of conditions, including, but not limited to humidity, surface temperature, and the use of additives or thinners. The use of accelerators or force curing may shorten the aged recoat of individual coatings. The above recoat windows may not apply if recoating with a product other than those listed above. If the maximum aged recoat window is exceeded, please consult your ICI Industrial Coatings Specialist for appropriate recommendations to enhance adhesion. Failure to observe these precautions may result in intercoat delamination.

Shelf Life: Over 12 months at 77°F (25°C) – unopened.

Hardness (ASTM D 3363, 7 day cure @ 77°F (25°C): 4H

Mix Ratio By Volume: 4 (base): 1 (converter) – see mixing instructions.

Induction: None – see mixing instructions.

Pot Life: 4 hours @ 77°F (25°C)

PERFORMANCE DATA

Adhesion: (ASTM D 4541) – Excellent

Salt Spray Resistance: (ASTM B 117) – Excellent

Abrasion Resistance: (ASTM D 4060) – Excellent

Humidity Resistance: (ASTM D 2247) – Excellent

Exterior Exposure: 45° South Florida – Excellent

Chemical Resistance: (ASTM D 1308 – 24 hour contact) resists splash and spillage of alkalis, salts, moisture, oils, greases, foodstuffs and detergents.

Stain Resistance: (ASTM D 1308 – 1 week contact) Excellent. Resists stains such as crayon, lipstick, coffee, soil medium, shoe polish, grape juice, ink pen, marker, and spray paint.

DANGER! FLAMMABLE. HARMFUL OR FATAL IF SWALLOWED. Read Label and Material Safety Data Sheet Prior to Use. See other cautions on last page. DSF3-0696



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FINISHES
SPECIAL COATINGS (9800)

FINISHES
SPECIAL COATINGS (9800)

ICI DEVOE COATINGS
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GENERAL SURFACE PREPARATION

All surfaces must be sound, clean, dry, and free of oil, grease, mildew, form release agents, laitance, and foreign matter. To insure the best appearance, the primer or undercoat should be smooth and free of any surface defects such as runs, dry spray or heavy orange peel.

Surfaces: **Steel** – Clean and prime with DEVTRAN® 205, DEVTRAN® 224HS, BAR-RUST 231™, BAR-RUST 233H™, BAR-RUST 235™, or TRU-GLAZW-WB® 4030 Epoxy. **Concrete Block** – Fill with DEVTRAN 205, DEVTRAN 220, DEVTRAN 224HS, BAR-RUST 231, BAR-RUST 235, BAR-RUST 233H, TRU-GLAZE-WB 4030 Epoxy, or BLOXFIL® 4000. **Fiberglass** – Solvent wipe, scuff sand and solvent wipe again. Prime with DEVTRAN 224HS. **Concrete Floors, Poured Concrete** – Cure at least 30 days. pH must be 10.0 or lower before painting. Acid etch or abrasive blast slick, glazed concrete or concrete with laitance. Prime with

DEVTRAN® 205, DEVTRAN® 220, DEVTRAN® 224HS, BAR-RUST 231™, BAR-RUST 233H™ Epoxy, BAR-RUST 235™, or TRU-GLAZE-WB® 4030 thinned 25% with recommended thinner or use PRE-PRIME 167™ or 168LTC™ Penetrating Sealer. **Drywall** – Prime with a premium acrylic latex vapor barrier primer-sealer. **Galvanized Steel and Aluminum** – Remove dirt and oils by solvent cleaning or with Devco Coatings DEVPREP® 88 Cleaner followed by a thorough water rinsing. Prime with DEVTRAN 205 or 201 Epoxy Primer.

Previously Painted Surfaces: Remove loose and peeling paint. Scuff sand glossy areas. Old coatings should be tested for lifting and bleeding. If they lift or bleed, remove them. Prime bare areas with a primer specified under **New Surfaces**.

DIRECTIONS FOR USE

Tinting: Tint the appropriate base with CHROMA-CHEM 844 colorants. (Do not use water based or other colorants.) Add colorants to only the base portion. Mix thoroughly before adding the converter portion.

Thinning: Thinning is not normally required or desired, and excessive thinning can adversely affect application and appearance properties. However, at lower temperatures, small amounts (5% or less) of the solvents on the reverse page may be added depending on local VOC and air quality regulations. Small amounts (5% or less) of Devco Coatings T-17 Thinner will improve roller or brush applications. For end uses such as transportation vehicles where the smoothest, orange peel-free appearance is desired, additional thinning may be needed.

Mixing: DEVTHANE 379UVA Enamel is a two component product supplied in 5 gallon or 1 gallon kits which contain the proper ratio of ingredients. The entire contents of each container must be mixed together. It is important that all mixing equipment is free of moisture and that moisture does not contaminate the coating. Mix the base portion to obtain a smooth, homogeneous condition. After mixing the base portion, add the converter slowly with continued agitation. Mix thoroughly. The pot life of the mixed material is 4 hours at 77° (25°C). Higher temperatures will reduce working time of the coating; lower temperatures will increase it.

Application: Apply by airless spray, air spray, roller or brush. For airless spray, any air, electric, or gas operated airless sprayer capable of 3,000 psi (207 bars) and able to support a .011" to .017" tip sizes can be used. Multiple guns and long fluid lines require pumps with adequate capacity. For air spray application, use a Graco #800 gun; a .070" or larger fluid tip. Adjust fluid and air pressure to get a good spray pattern.

Note: Be sure all spray equipment and fluid lines are clean, and free of water or solvents. For brush application, use good quality, dry, clean brushes. **For roller application use new, short nap mohair rollers.** Do not apply over wet surfaces or under very humid conditions where condensation or fog could settle on the coating during the cure process. Brushing and rolling may require multiple coats to achieve correct film thickness and/or hiding.

Spreading Rate: For maximum protection in corrosive areas, apply at 335 sq. ft. per gallon (8.2 m²/L) or 3.0 mils (75 microns) dry-4.8 mils (120 microns) wet. In mild to moderate exposures, apply at 500 sq. ft. per gallon (12.25 m²/L) or 2.0 mils (50 microns) dry-3.2 mils (80 microns) wet. Make allowance for any losses due to overspray or surface irregularities.

Dry Time: At 80°F (27°C) & 50% R.H., dries to recoat in 3 hours and dries hard in 16-24 hours.

Clean-up: Use T-9 Thinner.

Cure Acceleration: Devthane Cure Accelerator 070A0000 may be used to accelerate cure of this urethane at or below 40°F (5°C). 070A0000 is prepackaged (5 fluid ounces in a one-half pint container) for field addition. The addition of one to two ounces per gallon of urethane (one to two containers per five gallons of urethane) will decrease the dry hard time approximately one-third to one-half respectively. The pot life will be reduced one-half to three-fourths.

Ultraviolet Light Absorbers (UVA): Contains Devthane Ultraviolet Light Absorber.

PRECAUTIONS

DANGER! FLAMMABLE LIQUID AND VAPOR. HARMFUL OR FATAL IF SWALLOWED. ASPIRATION HAZARD - CAN ENTER LUNGS AND CAUSE DAMAGE. HARMFUL IF INHALED. MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS, INCLUDING DIZZINESS, HEADACHE OR NAUSEA. CAUSES EYE, SKIN AND RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN AND RESPIRATORY REACTION. OVEREXPOSURE MAY CAUSE BLOOD, LIVER, KIDNEY DAMAGE. USE ONLY WITH ADEQUATE VENTILATION. KEEP OUT OF THE REACH OF CHILDREN. NOTICE: Products in this series contain solvents.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. For emergency information call (800) 545-2643. Keep away from heat, sparks and flame. **Do not smoke.** Vapors may ignite. Extinguish all flames, burners, stoves, heaters and pilot lights and disconnect all electrical motors and appliances before use and until all vapors are gone. If sanding is done, wear a dust mask to avoid breathing of sanding dust. Do not breathe vapors or spray mist. If you experience eye watering, headaches, or dizziness, leave the area. If properly used, a respirator may offer additional protection. Obtain professional advice before using. Close container after each use. **FIRST AID:** In case of skin contact, wash off quickly with plenty of soap and water, remove contaminated clothing. For eye contact flush immediately with large amounts of water, for at least 15 minutes. **Obtain emergency medical treatment.** If swallowed, **obtain medical treatment immediately.** If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs, **get medical help.** **Note: These warnings encompass the product series. Prior to use, read and follow product-specific MSDS and label information.**

DS174-0798

SHIPPING

Freight Classification: Paint, 3, PG III, UN1263 (Flammable Liquid)
Flash point: 80°F (27°C)
Packaging: 1 gallon kit (3.785L) 5 gallon kit (18.925L)
 0.80 gallon base 4.00 gallon base
 0.20 gallon converter 1.00 gallon converter

Shipping Weight: 1 gallon kit - 12 lbs. (5.4 kg)
 5 gallon kit - 59 lbs. (26.8 kg)

379KXXX (11/99)
 Ad Stock #68659E



Cleveland,
 Ohio, U.S.A.
 800-654-2616
 www.devcoatings.com

ICI Devco Coatings is a member of the ICI Paints World Group

LIMITATION OF LIABILITY: To the best of our knowledge, the technical data contained herein are true and accurate at the date of issuance but are subject to change without prior notice. We guarantee our product to conform to the specifications contained herein. **WE MAKE NO OTHER WARRANTY OR GUARANTEE OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE.** Liability, if any, is limited to replacement of the product or refund of the purchase price. **LABOR OR COST OF LABOR AND OTHER CONSEQUENTIAL DAMAGES ARE HEREBY EXCLUDED.**

RD-6 COATING PRODUCT DATA SHEET

U.S. PATENT NO. 4,983,449
U.S. PATENT NO. 5,120,381



COATING SYSTEM FOR LINE PIPE

DESCRIPTION:

POLYGUARD RD-6 COATING SYSTEM consists of a fabric strengthened protective pipeline coating that is applied over a companion **LIQUID ADHESIVE**. The primary waterproofing material is a rubberized bitumen coating. Bonded to the outside surface of this coating is a very strong, tightly woven, polyolefin geotextile fabric. The fabric provides exceptional mechanical strength to the coating system permitting tension application, even during hot weather.

As a normal consequence of soil stresses that act upon stretchable or cold flowable coatings, this action will move or pull the coating from the top portions of the pipe surface, in directions down towards the sides of the pipe. The result of this movement can produce a buckle or fold in the coating along the sides of the pipe causing voids in the coating system. The woven geotextile fabric in **RD-6**, with high tensile and low elongation properties, will help resist this soil stress action and assist in the mitigation of the problem.

The geotextile fabric in **RD-6** will also assist in preventing the coating system from sagging or bagging at the bottom of the pipe.

Also, the fabric will not, by itself, retard the flow of protective electrical current that may contribute to a possible cathodic protection shielding condition.

The coating is supplied in roll form for easy application by various commercial, manually or power operated machines. **RD-6** is supplied with a separator sheet between layers. These machines have two spindles, one for the coating unwind and one to take up the separator sheet as the coating is applied.

RD-6 can also be applied manually, without machine. However, it is important to recognize that much more tension can and should be used during its application than that which is normal for other types of products.

An **OUTERWRAP** is recommended for use over the **RD-6 COATING**. Please consult **POLYGUARD PRODUCTS** for suggested materials.

POLYGUARD 600 LIQUID ADHESIVES are fast drying, rubber based materials in a solvent solution. They are available in solvent systems that will conform to most local air pollution requirements.

USES:

Although **RD-6** was designed originally as a reconditioning coating system, it has now achieved significant growth for uses in new construction to coat girth welds on mill coated pipe and in plant work on various pipe configurations. Please consult **POLYGUARD PRODUCTS** for specific recommendations relative to uses.

No other use of these materials is to be made without prior approval of **POLYGUARD PRODUCTS, INC.** as to service and method of application.

TECHNICAL DATA:		
PROPERTY	ASTM TEST	TYPICAL RESULTS
Total Thickness	D-1000	50 MILS (1.27 mm)
Tensile Strength, Warp Direction	D-1000	122 lbf/in (21 kN/m)
Water Vapor Transmission Rate	E-96 Procedure B	.04 grains/heft ² .02 g/h•m ²
Puncture Resistance	E-154	200 PSI (1379 kPa)
Burst Strength	D-751	350 PSI (2413 kPa)
Cathodic Disbondment, 77°F(25°C), 30 days, -1.5v 150°F(66°C), 90 days, -3.0v	G-8 -	Excellent Excellent
Adhesion, to primed surface	D-1000 Meth. "A"	20 lbf/in. (3.5 kN/m)
Impact Resistance	G-14	23.0 in./lb.

The information provided herein is based on our best knowledge, but **POLYGUARD PRODUCTS, INC.** does not warrant the results to be obtained or intend anything herein as a recommendation for any use except as herein described. This document does not constitute an offer to sell, and persons interested in **POLYGUARD PRODUCTS, INC.** are invited to discuss their requirements with **POLYGUARD PRODUCTS, INC.** All specifications are subject to change and all sales of **POLYGUARD** products are subject to **POLYGUARD'S** Conditions of Sale. INCLUDING THOSE LIMITED WARRANTIES AND REMEDIES.

ENNIS, TX 75120-0755
TEL: 972-875-8421
FAX: 972-875-9425
TELEX: 293265 (PTCX UR)

ADVANTAGES:

Following are the advantages of *RD-6* for pipeline coatings:

- Has excellent resistance to cathodic disbondment.
- Helps mitigate soil stress damage.
- The fabric will not, by itself, retard flow of protective electrical current that may contribute to a possible shielding condition.
- Easy to apply.
- Can be backfilled immediately after coating.
- Woven construction of geotextile fabric permits bitumen to bitumen contact at the overlaps. It has excellent ability at the lap to resist infiltration of moisture.
- Has excellent resistance to water or vapor transmission.
- Is not subject to deterioration due to exposure to below ground acids and alkalies that are encountered in normal soil.
- Provides uniform thickness.
- Has bitumen elastomeric properties to accommodate normal expansion and contraction of the substrate.

PRECAUTIONS:

The liquid adhesive is an industrial coating and would be harmful or fatal if swallowed. It is marked as red label from the standpoint of flash point. Prohibit flames, sparks, welding and smoking during application. Solvents could be irritating to the eyes. In case of contact with eyes, flush with water and contact physician.

Avoid prolonged contact with skin and breathing of vapor or spray mist from liquid adhesive. In confined areas, use adequate forced ventilation, fresh air masks, explosion proof equipment, and clean clothing.

Keep out of reach of children.

This material is offered for sale by **POLYGUARD PRODUCTS, INC.** only for the expressed purposes as described

in this literature. Any use of the products described in this literature for purposes other than taught therein by **POLYGUARD PRODUCTS, INC.** shall be the responsibility of the purchaser and **POLYGUARD PRODUCTS, INC.** does not warrant nor will be responsible for any misuse of these products. **POLYGUARD PRODUCTS, INC.** will replace, F.O.B. Ennis, Texas material not meeting our manufacturer's specifications within one year from date of sale.

POLYGUARD products, as described herein, are for industrial use only. The application procedures should be performed by workmen who are skilled in the application of materials described herein in accordance with manufacturer specifications.

MATERIAL SAFETY DATA:

All Material Safety Data Sheets and precautionary labels should be read and understood by all user supervisory personnel and employees before using. Consult **POLYGUARD PRODUCTS, INC.** Material Safety Data Sheets and OSHA regulations for additional safety and health information for the products described herein. Purchaser is responsible for complying with all applicable federal, state or local laws and regulations covering use of the product including waste disposal.

This is not a Material Safety Data Sheet and is not to be used as such. **POLYGUARD** has prepared separate Material Safety Data Sheets on each product.

PATENTS:

RD-6 COATING is protected by U.S. Patent #4,983,449. Patent #5,120,381.

TECHNICAL SERVICES:

Technical assistance and information is available from:

POLYGUARD PRODUCTS, INC.
BOX 755
ENNIS, TX 75120
PHONE: 972-875-8421
FAX: 972-875-9425

LIT/PIPELINE/RD6LINE12/15/98

POLYKEN® YG-III Plant Coating System for the Water Industry

Polyken Pipeline Coatings

System Description

Polyken #1019 (or #1029) **Primer** provides a uniformly smooth contact surface to promote high adhesion of the coating system to the pipe.

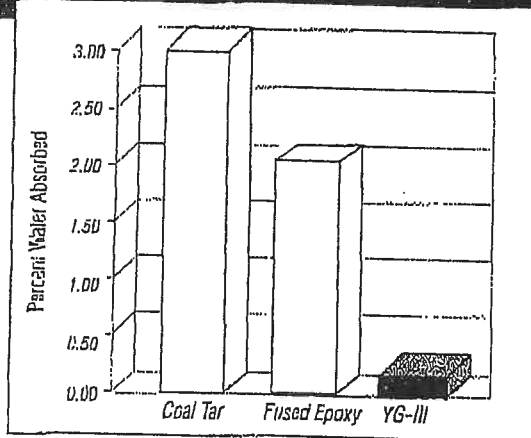
Polyken #989 is an anticorrosion inner layer engineered to assure a high bond with excellent conformability characteristics.

Polyken #955/956, the mechanical protection middle and outer layers, achieve a complete bond to the #989 inner layer, providing maximum handling and in-service protection for the coating system.

Product Advantages

- Proven long-term performance
- Impermeable to oxygen and moisture
- Resistant to soil stress
- Zero VOC coating system available
- Cross-linked butyl alloy adhesive
- Uniform coating thickness
- Low cathodic protection costs
- Exceeds AWWA standards
- Manufactured at ISO 9002 facility

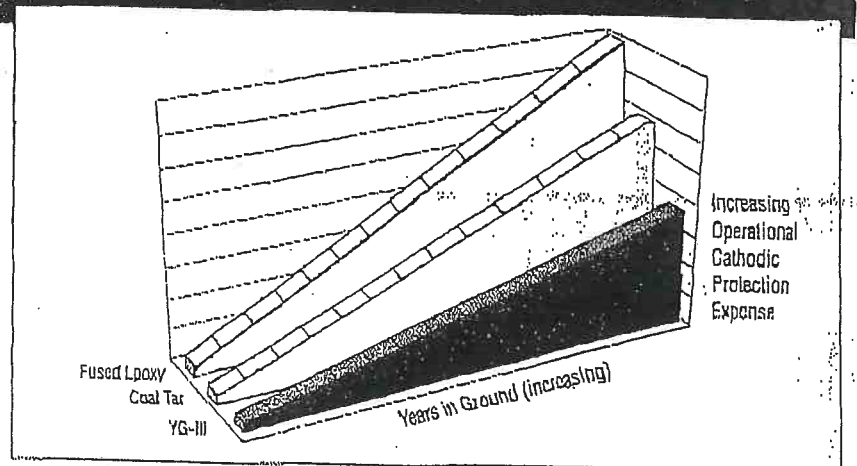
Water Absorption (ASTM G-62)



◀ This data illustrates the superior resistance to water absorption of the YG-III coating system. Less absorption means more stable cathodic protection and results in cost savings over the life of the pipeline.

▶ Polyken's forty years of industry experience and knowledge culminate in the manufacture of high-quality coating systems that are uniquely stable in any soil environment. The result is long-term performance and excellent cathodic protection characteristics, which yield cost savings for the pipeline owner.

Long-Term Operational Costs



Physical Properties

1019 Primer
 Percent solids: 20
 Solvent: Heptane
 Wt/gal: 6.3 lbs/gal
 Flash point: +10° F
Also Available
Zero VOC Primer

989 Inner Layer
 Thickness: 20 mil,
 .51 mm
 Tensile: 30 lbs/in width,
 5.3 kg/cm width
 Elongation: 300%

**955 Middle Layer/
 956 Outer Layer**
 Thickness: 30 mil each,
 total 60 mil
 .76 mm each, total
 1.52 mm
 Tensile: 25-50 lbs/in width,
 4.5-8.9 kg/cm width
 Elongation: 300-400%

System Properties — 80 mil System

	English	Metric
Peel Adhesion to Pipe:		
• ASTM D-1000	300 oz/in width	3.3 kg/cm width
Impact Resistance:		
• ASTM G-14	90 in-lbs	10.2 N-m
• ASTM G-13	1000 lbs, no holidays	450 kg, no holidays
Penetration Resistance:		
• ASTM G-17	11-15%	11-15%
Water Vapor Transmission Rate:		
• ASTM F-1249	0.03 g/100 sq in/24 hr	0.5g/sq m/24 hr
Volume Resistivity:		
• ASTM D-257	10 ¹⁵ ohm-cm	10 ¹⁵ ohm-cm
Dielectric Strength:		
• ASTM D-1000	20-23 kv	20-23 kv
Temperature Range:		
• Normal in-ground service	-30° F to 150° F *	-34° C to 65° C *

* Contact Polyken representative for specific project recommendations.

KENDALL-POLYKEN®

Southwestern Packaging Corp.
 960 Ardmore Houston Tx 77054
 Tel: 713 741 7003 Fax: 713 741 406
 Urban Pgr 713 760 069



ISO 9002
 Certificate Number: 20188

A **tyco** INTERNATIONAL LTD. COMPANY

Disclaimer: The values listed for product properties are averages obtained from Standard Industry Test Procedures, except where noted. All test procedures are performed under controlled laboratory conditions which differ from actual field conditions. Polyken cannot assure that the same product properties are obtainable in a commercially applied environment.

Strict adherence to Polyken Product Application Specifications is the only way to achieve optimum product performance results. Product application is beyond the control of Polyken and is the sole responsibility of the end user. Polyken only warrants its products to be free from defects in manufacturing materials and workmanship. Complete warranty details are provided in Polyken's Terms and Conditions of Sale.

For assistance in establishing engineering and application specifications, please contact Polyken Technologies, 15 Hampshire Street, Mansfield, MA 02048, Telephone (508) 261-6200 or (800) 248-7659, or your local Polyken representative.

RD-6 APPLICATION SPECIFICATION

Manual Operated or Power Machine Application

U.S. PATENT NO. 4,983,449
U.S. PATENT NO. 5,120,381



SPECIFICATION FOR HANDLING AND APPLICATION OF POLYGUARD RD-6 COATING FOR BELOW GROUND PIPING

1. MATERIALS

1.1 COATING THICKNESS

- 1.1.1 *RD-6* is 50 mils (1.27 mm) nominal total thickness, consisting of 10 mils (.25mm) of woven mesh geotextile fabric on the outside which is laminated to 40 mils (1.02 mm) of a rubberized bituminous compound. A release sheet separates layers in a roll.

1.2 ROLL WIDTH

- 1.2.1 Suggested roll widths for various sized pipes as follows:

4 inch (101.6 mm) pipe - 4 inch (101.6 mm) wide roll
6 inch (152.4 mm) pipe and larger - 6 inch (152.4 mm) wide roll

- 1.2.2 Roll widths based upon:

Two-spindle application where one roll of coating and one roll of outerwrap are applied simultaneously, or
One-spindle application where one roll of coating is applied. (When required, another one-spindle machine can be used to apply the outerwrap.)

- 1.2.3 Depending upon pipe diameter, number of rolls applied simultaneously and type of application equipment, wider rolls than 6 inch (152.4 mm) may be utilized. Consult manufacturer.

1.3 OUTERWRAP (if specified)

- 1.3.1 *Bonding type: POLYGUARD 611-B* - This adhering type outerwrap is 11 mils (.28 mm) minimum thickness consisting of 4 mils (.10 mm) of a bi-axial oriented polyethylene film to which is laminated a minimum of 7 mils (.18 mm) of a rubberized bituminous compound. A release sheet separates layers in a roll.

- A. The film described above in solid sheet form, shall have the following typical properties:

Tensile Strength: 4000 PSI (min.) ASTM-D-412 (Die C) Modified
Puncture Resistance: 250 (min. In. Oz. Tear) ASTM-D-781 (Sharp Object)

- 1.3.2 *Unbonded type: POLYGUARD 440 (Perforated or Non-Perforated)*

- 1.3.2.1 *POLYGUARD 440 OUTERWRAP* consists of a 4 mil (.10 mm) bi-axial oriented polyethylene film. Based upon specification, the film can be micro-perforated or non-perforated. The film shall have the same typical properties as described in 1.3.1 A.

The information provided herein is based on our best knowledge, but POLYGUARD PRODUCTS, INC. does not warrant the results to be obtained or intend anything herein as a recommendation for any use except as herein described. This document does not constitute an offer to sell, and persons interested in POLYGUARD PRODUCTS, INC. are invited to discuss their requirements with POLYGUARD PRODUCTS, INC. All specifications are subject to change and all sales of POLYGUARD products are subject to POLYGUARD's Conditions of Sale. INCLUDING THOSE LIMITED WARRANTIES AND REMEDIES.

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1.4 LONGITUDINAL MILL WELD SEAM STRIPPING MATERIAL (where required on DSAW pipe)

1.4.1 Polyguard RD-6 or

1.4.2 **POLYGUARD 606** - A 60 mil (1.52 mm) thick, reinforced coating consisting of a rubberized bituminous compound. It has no backing on either side of the compound. Release sheets separate layers in a roll.

2. HANDLING OF COATING MATERIALS

- 2.1 Coating and wrapping materials shall be hauled and stored in such a manner as to prevent injury to packages. No packages shall be dropped from trucks or handled with hooks.
- 2.2 All coating and wrapping materials shall be protected from the elements. Wrapping materials shall be transported only as needed during application of the coating, conveyed in a covered vehicle and moved directly from the vehicle to the coating or wrapping machines as required.
- 2.3 Coating and liquid adhesive shall be maintained at a temperature of 45° F. (7° C) or higher at time of application.

3. COATING APPLICATION

3.1 PIPE

3.1.1 Surface Preparation

Surface preparation of the pipe shall include:

- A. Removal of all visible oil and grease, by swabbing with a safety solvent that does not leave residue.
- B. Removal of splatter and slag from welds and pipe surface by filing, wire brushing or other methods satisfactory to Company representative.
- C. Minimum requirements: Pipe shall be cleaned to be free of all mill scale, loose rust, knurls, frost, dust, moisture and other deleterious matter. If power brushes are used in the cleaning process, a polished surface shall be avoided.
- D. Blast Cleaning (if specified): It is required to obtain a commercial finish (minimum), as described by NACE No. 3.
- E. Cleaning to the satisfaction of Company representative. Bare pipe shall be considered clean when all foreign matter has been removed, and a surface cleaned to the parent metal is immediately available to the coating operation.
- F. Protection of the cleaned pipe such that it will remain free from contamination and be suitable for immediate coating application. In the event of surface contamination prior to coating application, pipe shall be reprocessed through the necessary cleaning steps outlined above.

3.1.2 Liquid Adhesive Application

All pipe shall be covered with **POLYGUARD 600** or **600 VOC LIQUID ADHESIVES** after cleaning and before coating application. **LIQUID ADHESIVES** shall be applied with a clean brush or roller brush or other acceptable mechanical means to obtain uniform and complete coverage of the pipe surface. Liquid Adhesives shall be applied at a rate of 400 square feet (10.0m²/Liter) per gallon and shall be dry or tacky/dry to touch prior to coating application.

3.1.3 Weld Stripping Material (where required)

Where DSAW pipe is involved, the longitudinal mill weld seam shall be stripped with **POLYGUARD RD-6** preferably or **POLYGUARD 606** - 6" wide stripping material after the liquid adhesive has been applied to the pipe and before application of the coating. In applying the stripping material, position the material over the weld so that when the roll is unwound, half the width will rest on both sides of the weld. As the material is applied to the weld, remove the inner separator sheet next to the weld. When completed, manually press the stripping material into the weld crevices. When the 606 material is used, slowly remove the outer separator sheet from the compound while pressing the material with a piece of the release paper, to conform to the weld and pipe surface.

3.1.4 Coating (by machine)

- A. The primary coating shall be spirally wrapped by an approved machine on pipe suitably cleaned, and with liquid adhesive applied.
- B. The machine used shall be equipped with take-up spindles to remove and wind the separator sheet as the coating roll is applied to the pipe. The machine used shall be capable of applying the primary coating with uniform tension across the width of the roll equal to 15 lbs. (6.8 Kgs/25.4 mm) per inch minimum width (dead weight). The machine shall be equipped with a constant tension brake system that is used in conjunction with the primary brake to assure equalization of tension across the roll width and through out the complete unwind of the roll, regardless of the roll size.
- C. Operators shall make all necessary manual or machine adjustments to accomplish a uniform, tightly adhered coating having a lap of at least 3/4" (19.05 mm) over the preceding spirals. Care shall be taken that no wrinkles, puckers, voids, or breaks are left in the coating as a result of a deficiency in application.
- D. A bonding or unbonded outerwrap (if specified by the Company) shall be spirally applied. Operators shall make necessary adjustments to achieve a uniform, outerwrap having a lap of at least 3/4" (19.05 mm) over preceding spirals.
- E. Coated pipe shall be handled at all times with wide non-abrasive slings, belts or other equipment designed and maintained to prevent damage to the coating. All skid supports shall be padded to protect the coating. Equipment which the Company representative deems to be injurious to the coating shall not be permitted. Walking on the coated pipe shall not be permitted.

4. INSPECTION AND REPAIR

- 4.1 Where the coated pipe is above ground, the coated pipe shall be holiday detected and lowered into the ditch with care. Coated pipe shall not be lowered into the ditch until it has been inspected and approved by the Company representative.
- 4.2 The coating system shall be holiday detected with an adjustable electronic detector as follows:

In a single layer of the applied RD-6, make a hole through the coating to the pipe surface. Starting at a low voltage setting (approx. 3000 V), pass the detector over the hole several times at same rate it will be detected. If necessary, adjust the voltage gradually higher each time to the first setting that will consistently spark the gap at the hole. Do not exceed 5500 volts. Keep in mind the purpose is to find a void (holiday) in the coating. Excessive voltage can stress the coating. If a POLYGUARD OUTERWRAP is to be included with the coating in the detection process, please consult the manufacturer for recommended voltage.
- 4.3 All holidays and defects shall be repaired by the Contractor to the satisfaction of the Company representative. If any coated pipe is damaged upon lowering into the ditch, it shall be repaired in the position deemed most practical by the Company representative.
- 4.4 All holidays and all damaged or defective coating shall be repaired immediately.
 - A. Small or pinhole type holidays can be repaired in the RD-6 by applying liquid adhesive over the holiday area and when dry to touch, a patch of RD-6 shall be firmly pressed over the holiday. The patch and liquid adhesive should extend a minimum of 2" (50.8 mm) in all directions from the holiday. The pipe, to include the patched area, shall be circumferentially wrapped with one of the approved outerwraps. An unbonded outerwrap shall be secured with a Company approved, fiber reinforced adhesive tape.
 - B. For larger holidays or where coating is damaged that exposes pipe, remove damaged coating and smooth edges before repair is made. Finish repair as in A. above. If the damaged area is large enough that it requires a material patch larger than 6" (152.4 mm) x 12" (304.8 mm), then spiral wrap the pipe with RD-6, to include the damaged area. Over this, apply an outerwrap as in A. above.
 - C. If an unbonded outerwrap was used, remove outerwrap and make repair as in A. or B. above.
 - D. If a bonded outerwrap was used, do not attempt to remove outerwrap before making repair. Make repairs over the outerwrap surface in accord with A. or B. above.
- 4.5 All coating repairs shall be reinspected as outlined above.

RD-6 COATING APPLICATION SPECIFICATION GENERAL

U.S. PATENT NO. 4,983,449
U.S. PATENT NO. 5,120,381



COATING SYSTEM FOR GIRTH WELDS, PLANT PIPING, NEW PIPE, AND FOR THE RECONDITIONING OF LINE PIPE

DESCRIPTION:

POLYGUARD RD-6 COATING SYSTEM consists of a fabric strengthened protective pipeline coating that is manual or machine applied over its companion **LIQUID ADHESIVE**. The primary waterproofing material is a rubberized bitumen coating. Bonded to the outside surface of this coating is a very strong, tightly woven polyolefin geotextile fabric. The fabric provides exceptional mechanical strength to the coating system permitting tension application, even during hot weather. The geotextile fabric will help resist deformation of the coating from soil forces and from sagging on the bottom of the pipe. Also, the fabric will not by itself retard the flow of protective electrical current that may contribute to a possible shielding condition.

The coating is supplied in roll form for easy application by various commercial, manually or power operated machines. **RD-6** is supplied with a separator sheet between layers. These machines have two spindles, one for the coating unwind and one to take up the separator sheet as the coating is applied.

RD-6 can also be applied manually, without machine. However, it is important to recognize that much more tension can and should be used during its application than that which is normal for other types of products.

POLYGUARD 600 and **VOC LIQUID ADHESIVES** are fast drying, rubber based material in a solvent solution. They are available in solvent systems that will conform to most local air pollution requirements.

APPLICATION SPECIFICATIONS:

HANDLING MATERIALS: **POLYGUARD COATING** and **LIQUID ADHESIVE** should be hauled and stored in such a manner as to prevent injury to the packages. No pack-

ages should be dropped or thrown from trucks. Packages shall not be handled with hooks. All packages and rolls or wrapping materials should be stored in a dry place and kept from contact with earth and protected from weather at all times. It is recommended that the coating and liquid adhesive be transported in warmed vehicles and stored in heated buildings during cold weather.

Although the coating can be utilized at lower temperatures, to maximize the quality application characteristics of the coating system, it is recommended that the coating and liquid adhesives be maintained at a temperature of 45°F (7°C) or higher at time of application.

SURFACE PREPARATION: As a basic requirement, the pipe shall be cleaned of all paints, oil and grease, mill scale, loose rust, welding residue, knurls, frost, dust, moisture, weeds, and other foreign matter. Where feasible and practical, the surface can be blast cleaned to a commercial finish, such as described in NACE No. 3. Where mill coated pipe is involved, the **LIQUID ADHESIVE** and coating should be applied to the girth weld, starting on top of the mill coating, at least 1" back from the edges of the mill coating.

LIQUID ADHESIVE APPLICATION: **POLYGUARD 600 LIQUID ADHESIVE** should be applied at an average rate of 400 sq.ft. per gallon (10.0mm²/liter). Stir liquid adhesive before using. Apply liquid adhesive with brush or roller to clean and dry substrate. Do not thin **POLYGUARD LIQUID ADHESIVE**.

POLYGUARD RD-6 can be spirally wrapped by hand or power operated machine. Recommended machine to include two spindles. The coating is spirally wrapped with the bitumen side next to the dry or tacky/dry liquid adhesive. As the coating is unwound from its spindle, the separator sheet is rewound simultaneously onto the other spindle and discarded after roll is completely applied. Enough brake tension should be used to obtain good overlap con-

firmation and a smooth, tight, air pocket free condition to the pipe surface. The coating overlap should be no less than 1" (25.4mm), unless otherwise specified. Where DSAW pipe is being coated, prior to coating, **RD-6** material can be used for stripping purposes over the mill weld. The material is applied over the **LIQUID ADHESIVE** surface before the **RD-6** coating is applied. Centering the middle of the product over the weld, the roll is unwound normally, removing the separator sheet as it is unwound. If the coated pipe in hot weather remains in either an open ditch or on skids for an extended period, it is suggested to overwrap the coating with kraft paper or other suitable temporary material.

In most cases, but especially if soil conditions dictate, it is advisable to overwrap the **RD-6** with a permanent type outerwrap. **POLYGUARD** manufactures several types of outerwrap, bonded or unbonded, for use over **RD-6**, if required. Refer to data sheet for **611-B** and **440 OUTERWRAPS** for further information.

LOWERING IN: The pipe should be inspected immediately before lowering-in with a holiday detector. The coating system shall be holiday detected with an adjustable electronic detector as follows:

In a single layer of the applied **RD-6**, make a hole through the coating to the pipe surface. Starting at a low voltage setting (approx. 3000 V), pass the detector over the hole several times at same rate it will be detected. Adjust the voltage gradually higher each time to the first setting that will consistently spark the gap at the hole. Do not exceed 5500 volts. Keep in mind the purpose is to find a void (holiday) in the coating. Excessive voltage can stress the coating. If a Polyguard Outerwrap is to be included with the coating in the detection process, please consult the manufacturer for recommended voltage.

BACKFILLING: Care shall be taken in backfilling to avoid sharp rocks or other ma-

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terial in the backfill that would damage and penetrate the coating. In areas of rough backfill, suitable rock shielding shall be provided to protect the coating from backfill damage.

PRECAUTIONS:

The liquid adhesive is an industrial coating and would be harmful or fatal if swallowed. It is marked as red label from the standpoint of flash point. Prohibit flames, sparks, welding and smoking during application.

Solvents could be irritating to the eyes. In case of contact with eyes, flush with water and contact physician.

A void prolonged contact with skin and breathing of vapor or spray mist from liquid adhesive. In confined areas, use adequate forced ventilation, fresh air masks, explosion proof equipment, and clean clothing.

KEEP OUT OF REACH OF CHILDREN.

This material is offered for sale by POLYGUARD PRODUCTS, INC. only for the purposes as described in this literature. Any

use of the products described in this literature for purposes other than taught therein by POLYGUARD PRODUCTS, INC. shall be the responsibility of the purchaser and POLYGUARD PRODUCTS, INC. does not warrant nor will be responsible for any misuse of these products. POLYGUARD PRODUCTS, INC. will replace, F.O.B. Ennis, Texas material not meeting our manufacturer's specifications within one year from date of sale.

POLYGUARD products as described herein are for industrial use only. The application procedures should be performed by workmen who are skilled in the application of materials described herein in accordance with manufacturer specifications.

MATERIAL SAFETY DATA:

All Material Safety Data Sheets and precautionary labels should be read and understood by all user supervisory personnel and employees before using. Consult POLYGUARD PRODUCTS, INC. Material Safety Data Sheets and OSHA regulations for additional safety and health information for

the products described herein. Purchaser is responsible for complying with all applicable federal, state or local law and regulations covering use of the product including waste disposal.

This is not a Material Safety Data Sheet and is not to be used as such. POLYGUARD has prepared separate Material Safety Data Sheets on each product.

PATENTS:

RD-6 is protected by:

U.S. patent #4,983,449.
U.S. patent #5,120,381

TECHNICAL SERVICES:

Technical assistance and information is available from:

POLYGUARD PRODUCTS, INC.
BOX 755
ENNIS, TX 75120
PHONE: 972-875-8421
FAX: 972-875-9425

LIT/PIPELINE/RD6GIRTH 11/07/96

POLYGUARD "RD" SERIES COATINGS AND SOIL STRESS

Geotextile Fabric vs. Solid HDPE Film

U.S. PATENT NO. 4,983,449
U.S. PATENT NO. 5,120,381



A documented problem with many coating systems is their limited resistance to soil stress. In service, coatings in most areas are placed under stress by backfill soil.

What happens to a coating system as the result of soil stress is here referenced as the effect of backfill settlement, pipe movement, or alternately wet and dry conditions in the soil.

Soil stress occurs regardless of the temperature at which the pipeline is operated. However, the stress can often be accelerated by the higher temperatures reached in operating conditions of the pipeline, since high temperature can soften the coating system and make it vulnerable to deformation and/or elongation.

Relative to tape coating systems, three properties of the **BACKING MATERIAL** of the coating become important considerations if that system is to resist soil stress. These properties are:

BACKING MATERIAL PROPERTY	DESIRABLE FOR SOIL STRESS RESISTANCE
Tensile Strength	High
Elongation	Low
Heat Resistance	High

The solid polyethylene film backing materials used with many laminated type coatings are designed for reasons specifically associated with relatively low tensile strength and high elongation properties. These properties are good for coating such things as short radius bends, tees, and other irregularly shaped objects. However, these same properties in a backing material are much less desirable when considering soil stress **WHERE RESISTANCE TO STRETCH PROVIDES A BIG ADVANTAGE.**

The woven slit film polypropylene fabric used in the **POLYGUARD's "RD"** coating systems have been used since the late 1970's in civil engineering applications. **POLYGUARD** has long been a major supplier of this fabric, for highway reconstruction and bridge deck waterproofing. For this end use, the fabric is laminated with a coating formulated for adhesion to concrete pavements.

For several reasons, one of which is resistance to soil stress, **POLYGUARD** began in 1988 to develop and test a modification of the highway product which would be suitable for pipeline coating as a replacement for cold applied coating systems in certain applications. The **RD-Series** products are the result of this development.

We believe that **POLYGUARD "RD"** coatings offers an appreciable increase in resistance to soil stress deformation in service. Comparative properties include:

TEST COMPARISON "RD" BACKING vs TYPICAL TAPE BACKING			
PROPERTY	"RD" COATING WOVEN SLIT FILM POLYPROPYLENE BACKING	TYPICAL COLD APPLIED COATING SOLID HDPE FILM BACKING	TEST METHOD
Tensile Strength	122 lb/in width	12.1 lb/in. width	ASTM D 882 Method B
Elongation to Break	50% under 136.4 lbs. load	>400% under 12.1 lb. load	ASTM D 882
Thermal Stability for Equivalent Mass of Polymeric Material	200-250	140-190	ASTM D 882 Deflection temp. in deg. F @ 66 lbs/in ² fiber stress

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The advantages of the "RD" coating configuration becomes obvious from the above results. High density polyethylene is a low strength, relatively very stretchable material, and is considered by plastics engineers to have low thermal stability. The woven polypropylene fabric backing used in the "RD" coating was a designed geotextile for applications where high strength and low elongation are required. Additionally, polypropylene polymers do not exhibit thermoplastic behavior until somewhat higher temperatures are reached.

LIT/PIPELINE/RD6SOIL12/15/98



NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
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J-14 Worley Daily Production Reports



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #1

Date:	April 16, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0661D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	0%	0%	0%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Set up lay down area. Obtained necessary permits to allow access on base. Obtained dig permit. Introductory meeting to discuss method to approach modifications to the JP5, DFM, and DFM-s fuel lines. Limiting dates on the JP5 line between April 26 th and May 12 th . Attendance included Terri Regin, Kirsten Glesne, Bill Tull, Sonny Weathers, and Jeanette Edge. It was noted in this meeting that there was no need to follow the rule of digging no closer than 2 feet to the pipe. Some equipment arrived on site and was offloaded.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Kirsten to prepare a list of project "to do's" for tomorrow.
Work Planned Next 24 Hours:	Unload 2 containers of material and some airfreight. Demolish concrete foundation around VP25 DFM-S.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #2**

Date:	April 17, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0662D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	0%	0%	0%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Concrete cover was demolished off VP25 . Waiting on hot work permit to allow rebar to be cut. Obtained picture ID's of contractors on site to allow mobility. Meeting took place in the morning to discuss scheduling for the project. In attendance; Terri Regin, Kirsten Glesne, Jeanette Edge, Bill Tull, and Sonny Weathers. Decided that JP5 line was of highest priority and that all fabrication work should be completed and sent to be sand blasted and primed. The second stage would be to remove the DFM-S line and finally the DFM system. Various valve pits were drained of rainwater by the fuels department. Two cargo containers arrived on site late in the afternoon, but were not unloaded.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Cargo ships were late arriving. Fire department did not arrive on site to give Hot Work Permits, delaying work to commence.
Work Planned Next 24 Hours:	Unload materials, obtain hot work permits, review schedule, drain remaining valve pits of rainwater.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #3**

Date:	April 18, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0663D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	1%	1%	1%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Scheduling meeting took place in the morning to discuss shutdowns. In attendance were Kirsten Glesne, Terri Regin, Jim Rice, Carlos Brown, and Jeanette Edge. JP-5 line is to be split into three sections, one between the air field and VP9 JP-5, VP9 to the pier, and the pump house 1982 for drain up and tee-in purposes. It was approximated that it will take 10-12 days to complete JP-5 line drain up. Jim Rice to give go ahead on which lines to shut down first depending on the ships planned to dock for fuel. More valve pits were drained of rainwater by fuels. Obtained Hot Work permit for one week in lay down area, and permitted to work on VP25 DFM-S between the fuels building and pier 1. Concrete cover was cut, removed and demolished. Excavation around VP25 DFM-S and demolition of concrete walls with hydraulic hammer on a track hoe. While using the hammer jack on the concrete walls, conduit in the valve pit was broken due to falling concrete and wires sparked, creating a fire in the conduit. Fire department and police officers arrived on site to investigate. Continued to remove materials from containers using the forklift.
Problems / Areas of Concern:	While using hammer jack on concrete walls, conduit in VP25 DFM-S that was told



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	to be dead was broken, and wires sparked creating a flame in the conduit. Incident report was filed with Terri Regin. Fire Department and fuels to investigate. JA Jones called out to trace wires to disconnect connection.
Work Planned Next 24 Hours:	Remove remaining materials from container, commence fabrication for JP-5, drain remaining pits of rainwater.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #4

Date:	April 19, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0664D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	8	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	2%	2%	2%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Began fabrication of piping at fabrication yard. Emptied material containers on site, ready for pick up. One container was removed, the other is waiting to be removed. Contacted A+A Waste Management for sub-contractor agreement for the removal and disposal of solid waste. Terri Regin, Kirsten Glesne, and Jeanette Edge investigated each valve pit to ensure that there are no other electrical connections in valve pits that have to be locked out and tagged. Informed that we need special permission to enter the airfield along with radios and training. Continued breaking up concrete at VP25 DFM-S and dug 20 ft back from the pit with approval from the fire department and fuels. Electricity was disconnected from the VP and tested prior to any work commencing. Unbolted and removed a 12" DB&B valve from AV gas line at VP 6C. Traced the electrical wire from VP25 DFM-S as far as possible to determine its location.
General Comments:	One contractor from Cypress Creek (Jose) did not work today due to death in family. Roberto Colon is to bring a map indicating all utilities on base on Monday. Fuels working with JA Jones to get all electrical wires disconnected in VP24 (JP-5, DFM, DFM-S) and VP25 (DFM-S)
Work Planned Next 24 Hours:	Continue fabrication. Remove valves from AV gas line. Excavation around VP24 if electrical issue is resolved.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #5**

Date:	April 20, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0665D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	8	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	3%	3%	3%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Removed two 12" DB&B valves from AV gas line in VP6A and 6B. Bolts were tight and took a long time to loosen. Heard fluid in the line when valve was opened in VP6B. Went through procedure to ensure that it was safe to remove the bolts from the flanges. Opened up the low point drain to determine the contents of the pipe was water. Removed the valve and installed blind flanges. Ground water discharge from VP 6A AV gas line was 800 gallons, and from VP 6A AV gas line was 270 gallons.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Heavy rainfall caused work to slow down as valve pits had to continue to be drained.
Work Planned Next 24 Hours:	Continue fabrication. Excavation of valve pits to be demolished.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #6

Date:	April 22, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0666D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	5%	5%	5%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Removed 6" DB&B valve from Tank 1088. Excavation of VP56 DFM. Received hot work permit for week at home site. Continued fabrication on site. Moved hammer track hoe with Low Boy to VP4 JP-5 and began excavation of the pit. Frank Cortez said that there is no problem to cross the road with the hammer jack as long as two flags people were present.
Agreed Scope Changes:	
Problems / Areas of Concern:	Shut down early on VP56 DFM due to pressure in the line.
General Comments:	
Work Planned Next 24 Hours:	Drain VP56 DFM and VP24 DFM, DFM-S, and JP-5. Pull valves from Tank 1080 and 1082. Demolish VP4 JP-5 and VP56. Continue fabrication



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #7

Date:	April 23, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0668D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	5%	5%	5%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Demolished VP4 JP-5. Hot work permit was obtained and rebar was cut along with supports. Two (2) 12" DB&B valves were pulled from Tank 1080. Some bolts were removed from valves in Tank 1082. New material arrived on site from PRISA including some flanges, pipe, reducing tees, and nuts, bolts and studs. Discussion with Pedro Ruiz indicates that the contaminated soil in VP7 (DFM-S) is to be dug up and put back in place when completed work. VP5 (JP-5) was excavated and demolition was half completed. Continued fabrication on site.
Problems / Areas of Concern:	Jim Rice would prefer that the air eliminators on Pier 1 and 1A were fully contained systems.
General Comments:	Goal to get fabrication work for JP-5 and DFM-S lines completed by Saturday and ready to be x-rayed on Monday, followed by sandblasted, primer, and painted on Tuesday.
Work Planned Next 24 Hours:	Roberto Colon is to meet with Kirsten to discuss issues with power line and poles overhead at VP5, VP23, and VP24. Drain DFM-S by tomorrow. Drain JP-5 up to tank 85 and pull valve. Drain rainwater from VP56, VP23, and VP24. Excavate and demolish VP6 and VP7.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #8

Date:	April 24, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0669D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	5%	5%	5%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Demolished VP7 DFMS. Began work on VP8/9 DFM-S. A CP wire came loose. Removed two 12" DB&B valves from Tank 1080. Continued fabrication on site. Put up a new safety fence around all pits. Updated pipeline diagram to indicate flow of all fuel lines, and location of all pits.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Meeting with Public works tomorrow. Meeting with the Fuels Department.
Work Planned Next 24 Hours:	Hand dig around VP24. Drain VP56 DFM and demolish. VP8/9 DFM-S complete demolition. Demolish VP6 DFMS.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #9**

Date:	April 25, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0670D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	6%	6%	6%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Demolished VP 6 and VP 8. Removed 6" DB&B from Tank 1080. Hand dug conduit in VP24. Drained out VP 56. DFM-S line is drained. QA / QC meeting, minutes will b e included with weekly progress report. Cut rebar and cleaned up VP4, VP5, VP6, VP7, VP8, VP25. Continued fabrication. CP wire was traced back to rectifier by JA Jones, and arrangements are being made for repair.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Demolish VP56. Demolish concrete at VP25.



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NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #10**

Date:	April 26, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0671D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	8%	8%	8%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Cleaned up all concrete in pits. Demolished / cleaned up VP56. Continued working on fabrication. Gained access to the pier. Dug around buried tee and found that the tee did not connect to the 12" vertical pipe, but did connect to a 4" horizontal pipe. One roll off tank full and to be removed on Monday.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Talk to operations on Monday to discuss the buried tee area.
Work Planned Next 24 Hours:	Remove every other bolt in PH 466. Continue fabrication.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #11**

Date:	April 27, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0672D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	10%	10%	10%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Removed every other bolt from Pump House 466. Excavation around VP 24 found that the lines are not as shown on drawing. Unsure where JP5 line run. Dug with high caution. Continued fabrication in preparation to send for sand blasting and primer on Tuesday.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Talk to operations about situation with VP 24.
Work Planned Next 24 Hours:	Vat truck to arrive, DFM-S line to be drained, and equipment unbolted and removed. Continue fabrication. Look at situation with buried tee. Continue excavation around VP24.



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**CONTRACTOR WORK SUMMARY
SITE WORK DAY #12**

Date:	April 29, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0673D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	16%	16%	16%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Vat truck arrived on site @ 7:00 and left at 5:00. Draining DFM-S line at PH 466. Removed some piping and equipment from PH466. Continued excavation and demolishing of VP 24 DFM. X-raying took place from 10-6:30. Roll off tanks were removed from site, and a new tank was placed by VP24 as well as one by building 466 for all steel scraps. Continued fabrication and repairing one weld indicated by x-ray.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Continue fabrication. Dismantling PH 466 piping. Excavating 24 to determine location of pipelines. Demolish VP23. Drain DFM-S at VP 7.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
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**CONTRACTOR WORK SUMMARY
SITE WORK DAY #13**

Date:	April 30, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0677D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	22%	22%	22%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	<p>Vac truck arrived at 8:00 continued drained DFM-S low point drain at VP 7 as well as VP25 at Pier 1. Trunk left site at approx. 4:00.</p> <p>Continued excavation of VP 24 to determine location of pipelines. Demolished VP 23 and part of VP24. Continued fabrication. Steel and Pipe arrived on site to get all above ground piping that is to be sandblasted, primer, and painted. Near VP 23 there was oil seen in the ground near the elbows. Environment indicated that this was a known contaminated area, known as a "plume" in the ground. Jim Rice is to verify how to handle this situation.</p> <p>VP24 was backfilled near the road for safety reasons.</p> <p>Note: On April 30/2002, Vac truck was requested to arrive on site for 10 hours starting at 8:00 am.</p>
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Tie in VP23 DFM-S. Clean up VP24. Continue fabrication. Change out valves on Pier 1 and 1a. Install 4"x8" reducers and valves.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
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CONTRACTOR WORK SUMMARY
SITE WORK DAY #14

Date:	May 1, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0680D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	20%	20%	20%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	<p>Vac truck arrived at 7:30 to continue draining PH 466. Drained DFM-S low point drain at VP 7. Trunk left site at approx. 4:00.</p> <p>Transfer taking place from Tank 83 DFM to Tank 1996. VP 56 is isolated from system. JP-5 was transferred to airfield.</p> <p>Continued dismantling PH 466 piping. Continued excavation of VP 24 to determine location of pipelines. Demolished VP 23. Continued fabrication.</p> <p>On Tuesday April 30, 2002 VP , approx. gallons of rainwater was drained from the pit.</p>
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Above ground material was sent to be sand blasted, primer, and painted. It will take approximately 3-4 days for materials to be delivered back on site.
Work Planned Next 24 Hours:	Drain up at VP 25 DFM. Complete dismantling of PH 466. Continue to dig at VP 24. Continue fabrication.



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NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #15**

Date:	May 2, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0684D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	11.5	11.5	11.5	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	28%	28%	28%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Welded 2" nipple in VP4. Cleaned up VP24 for working conditions, a lot of hand digging was involved. Continued fabrication. Tied-in VP 25. VAC truck worked from 8 – 5:15. QC meeting took place in the public works building. Meeting minutes attached to the weekly report. Ground water discharge out of VP 27 was approximately 710 gallons on Saturday April 27.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Meeting with Roberto Colon about the poles near VP5. Change out valves at head of Pier 1 and 1a. Weld in 2 reducers. Weld in a 4" cap in VP 25. Remove pit cover from VP2 (Air field). Clean up VP25, coating on pipe and backfill the pit.



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CONTRACTOR WORK SUMMARY
SITE WORK DAY #16

Date:	May 3, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0685D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	30%	30%	30%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	<p>Welded 4" cap in VP25. Removed bolts from valves on Pier 1 and 1a. Removed and replaced valve on Pier 1, tightening four machine bolts. Removed valve and reducer on the pier and replaced it with a 4"x6" reducer.</p> <p>Continued fabrication. Talked to Roberto Colon about the communications pole located near VP5. He is going to talk to JA Jones about holding the pole while working, but there is no equipment available on site to do this job. Worley is willing to pay for the equipment, but would prefer public works to supply the personnel. In the case that they have to relocate the line it will take 15 days. The power lines are in close proximity to the communication lines.</p> <p>Removed pit cover from VP 2 (Air Field). A flanged spool piece is going to have to be added to this modification unless significant excavation around the pit is done in order to remove flanges.</p> <p>A+A Waste management picked up one roll off tank and returned another one. VAC truck worked from 8 - 4.</p>
Work Planned Next 24 Hours:	<p>Remove other valve from pier and blind flange openings. Remove second valve and reducer from pier 1 DFM-S and replace with 4"x6" reducer. Drain up VP6 DFM-S.</p>



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #17

Date:	May 4, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0686D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	
General Type of Work:	Project Engineer	Piping	Inspector	
Number of Staff on site:	2	9	1	
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	
Hours Worked Today:	10.0	10.0	10.0	
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	
Lost Time Incident:	YES / NO	YES / NO	YES / NO	
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	32%	32%	32%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Removed valve from pier 1 and covered openings with blind flanges. Waiting until 16" DFM line is out of service to obtain more room to install new valve. Welded 4"x6" reducer on Pier 1 DFM-S, and placed new 4" DB&B on both sides, and installed camlocks. Welded on a thread-o-let for the pressure relief air eliminator. Drain up at VP6. Packing was leaking at VP7 on the 2 1/2" drain valve. Pipeline was secured, cracked flanges on the line, line was found to be clogged, 2" drain valve was removed and installed blind flange. Sonny Weathers and Jeanette Edge visited Steel and Pipe to verify quality of sandblasting, primer and paint. VAC truck worked from 8 - 4:30, offloaded fuel.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Drain DFM-S. Drain JP-5. Welding on caps in VP6, VP7 on DFM-S. Continue fabrication.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #18

Date:	May 6, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0691D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck Operator
Number of Staff on site:	2	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10.0	10.0	10.0	8.0
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	36%	36%	36%	
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Drain DFM-S. VP7 installed a 2" nipple and tapped it. Drain JP-5 at VP6, drain valve clogged moved to VP3 and continued draining by both the fuels department and Worley. Drained approx. 3000 gallons of fuel. Ground water discharge at VP6 was approx. 404 gallons. Cut bolts on Pier 1 and 1A on 16" lines. Replace with new bolts. Continue fabrication.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	X-Ray will be here on Wednesday. Steel and Pipe will drop off pipe tomorrow.
Work Planned Next 24 Hours:	Continue drain up of JP-5 line. Continue to cut bolts on 16" lines on Pier 1 and 1A. Continue fabrication.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT-- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #19

Date:	May 7, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0692D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	2	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10.0	10.0	10.0	8.5
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	38%	38%	38%	38%
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	May 24/2002

Summary of Work Completed:	Installed skillets in Air Field filters. Drain up at VP 3 JP-5 approx. 1609 gallons of fuel. Drained 34 gallons of ground water from VP3. Cut bolts at Pier 1 and 1A, replaced with new bolts. Removed pumps and motors from Pump house 466. Continued excavation of vertical 12" piping near VP27. Steel and Pipe delivered piping. Continue fabrication.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Remove spool at VP 3 and VP 6. Install new spool piece. X-Ray on site tomorrow. Continue fabrication. Break bolts at pump house 1982 and pier 1 and 1A.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #20**

Date:	May 8, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0693D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	2	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12.0	12.0	12.0	9.0
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	40%	40%	40%	40%
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	May 24/2002

Summary of Work Completed:	X-Ray arrived on site at 8 :45 and worked until 7:00. Moved pumps and motors to drum storage on site. Continued fabrication. Began breaking bolts at pump house 1982. Began bolt up in VP3 near the Air Field, installed blinds. Installed skillets and spool piece at VP6.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Finished drain up at pump house and pier. Install spool piece in VP3 AF. Continue fabrication. Continue breaking bolts at pump house 1982. Change out valves at pump house 1982.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #21**

Date:	May 9, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0694D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	2	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10.0	10.0	10.0	9.5
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	42%	42%	42%	42%
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	

Summary of Work Completed:	Continued Fabrication. Applied primer and coating in VP 25. Back fill VP25. Installed 2" nipple in VP24. Continued breaking bolts at Pier 1 and 1A. Installed spool piece at VP 3. Continued breaking bolts at pump house 1982. Removed roof of VP 10 and VP 11. QC meeting at Public Works Office, minutes attached to weekly report. Continued drain up of JP-5 from VP9 to the Pier.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Tie in at VP24. Install valves at pump house 1982.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #22

Date:	May 10, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0695D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	2	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	14.0	14.0	14.0	12
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	44%	44%	44%	44%
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	May 24/2002

Summary of Work Completed:	Finished drain up of JP-5 lines. Continued breaking bolts in pump house 1982, and changed out two 12" valves. Removed one 16" valve and replaced with Blind Flanges. Drain up at VP24 cracked flanges, tie-in piping with one bead and hot pass and installed a 12" DB&B valve.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Finish changing out valves in pump house 1982, finish welding in VP24.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #23

Date:	May 11, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0696D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	2	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10.0	10.0	10.0	8.0
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:	46%	46%	46%	46%
Anticipated Completion Date:	May 24/2002	May 24/2002	May 24/2002	May 24/2002

Summary of Work Completed:	Changed out two 16" DB&B in pump house 1982. Finished welding in VP24.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Tie-in VP9. Change up valves on pier 1 and 1A. Change out valves in VP 10 and VP 11.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #24**

Date:	Monday, May 13, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0697D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	2	8	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10.0	10.0	10.0	8.0
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002	

Summary of Work Completed:	Drained VP 9 for tie-in. Removed valves and dresser couplings. Installed new 8-inch DBB valve. Welded bead and hot pass on 12-inch spool piece. Installed new 12-inch valve.
Agreed Scope Changes:	Saddle connections will be used since 8-inch and 12-inch pipeline so not line up. This will avoid any misalignment with the tee spool pieces.
Problems / Areas of Concern:	12-inch and 8-inch pipeline centers had 3-inch difference in elevation. 12-inch pipeline under dresser couplings were at an angle. In order to keep welding within code, branch connections needed to be used rather than tees on 12x8 and 12x6 connections.
General Comments:	
Work Planned Next 24 Hours:	VP-5 tie-in and completion of welding in JP-5 VP 9



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
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**CONTRACTOR WORK SUMMARY
SITE WORK DAY #25**

Date:	Tuesday, May 14, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0698D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	12	12	8.5
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002	

Summary of Work Completed:	Completed welding on 12-inch line in JP-5 VP-9. Drained up JP5-VP5 and completed tie-in of new pipe with a bead and hot pass on welds. Continued fabrication of DFM VP 24.
Agreed Scope Changes:	
Problems / Areas of Concern:	JA Jones arrived to hold communications pole at 7:45 AM with a crane. They did not have a way to attached strap to the pole. After several phone calls they arrived at 9:00 with a man lift to hold pole. Work began once pole was supported.
General Comments:	
Work Planned Next 24 Hours:	Welding of 8" pipe and flanged in JP5 VP 9. Replacement of JP5 VP10, removal of valves in VP11, installation of pipe spool in PH 1982 meter run.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #26**

Date:	Wednesday, May 15, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0700D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	8.5
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002	

Summary of Work Completed:	Welding of 8" pipe and flanged in JP5 VP 9. Drain-up and removal of 12" valves in VP11. Removal of valve in VP 10. Blind flanges installed. Installation of JP-5 pipe spool in PH 1982 meter run.
Agreed Scope Changes:	
Problems / Areas of Concern:	12-inch valve in VP 10 could not be reinstalled as flanges were 3/4" too close upon removal of valve and in a tremendous bind. Flange will have to be cut out and welded on to allow for fit and eliminate need to demolish pit.
General Comments:	
Work Planned Next 24 Hours:	Installation of 16" valve at head or piers 1 and 1A. Welding of 8" reducing pieces and installation of 4" valves on JP-5 pipeline Pier 1. X-ray to be on-site for tie-in welds at VP 24, VP-5 and fabrications.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #27**

Date:	Thursday, May 16, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0709D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	NDT/X-Ray
Number of Staff on site:	1	9	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	11	11	10	12
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002		

Summary of Work Completed:	Welded and two reducers on JP-5 Pier 1 and installed valves. Tied-in JP-5 VP4, repaired weld on VP 5, installed 16-inch on JP-5 pipeline valve at head of Pier 1. X-ray crew on site shot JP-5 VP 4, 5, 9, and 24.
Agreed Scope Changes:	
Problems / Areas of Concern:	Jim Rice and Fuels changed target date for completion of JP-5 flight line portion. They miscalculated and needed to do a transfer to the airfield prior to Tanker arrival on May 21. We changed plan and tied in VP 4 so airfield portion was complete. Remainder of pier 4" valves may not get done prior to tanker arrival.
General Comments:	
Work Planned Next 24 Hours:	For JP-5 Pipeline, completion of VP 2, completion of pressure relief piping and stripper piping.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #28**

Date:	Friday, May 17, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0710D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	11.5	11.5	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002	

Summary of Work Completed:	On JP-5 Pipeline, removed valve in VP 2, welded spool piece for VP 2, welded 4-inch reducers on Pier 1, installed pressure relief piping on pier. Taped VP4 and VP5
Agreed Scope Changes:	
Problems / Areas of Concern:	Fuels is undecided if they will do airfield transfer to not prior to tanker arrival. It was agreed that we would return the line to fuels for them to refill on Monday, May 20. Worley will not begin anything it cannot complete prior to Monday.
General Comments:	
Work Planned Next 24 Hours:	Welding of flange on JP-5 VP 10, installation of valve. Installation of stripper piping on JP-5, installation of spool piece in VP 2, removal of skillets.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #29**

Date:	Saturday, May 18, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0711D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	14	14	12	13.5
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002	

Summary of Work Completed:	On JP-5 pipeline, welded on flange on VP 10, installed new 12-inch valve. Installed stripper piping on in VP 27, welded 3/4" relief in VP 24, installed spool piece in VP 2, removed skillets at airfield filter banks and VP6. Taped and backfilled VP 24. Backfilled VP 4 and 5.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	JP-5 Pipeline is ready for service. Some relief piping remains, but is piped to valve so line will not need to be taken out of service to complete.
Work Planned Next 24 Hours:	Walk through of pipeline to prepare for refill. Assist Fuels with refilling of pipeline. Fabrication of VP 24 DFM. Installation of piping in PH 466.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #30**

Date:	Monday, May 20, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0714D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9.5
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002	

Summary of Work Completed:	Walked through JP-5 pipeline and tighten all bolts and fittings. Refilled JP-5 from tank to pier. Welded out VP 10. Installed air eliminators on Pier 1. Installed cross connect on Pier 1A. Removed 6-inch valve and installed skillets at VP 11. Removed debris around valve pits for disposal. Continued fabrication on DFM pipeline. Drained up DFM-S.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	JP-5 pipeline filled and tested from tanks to piers.
Work Planned Next 24 Hours:	Installation and tie-in of piping at PH 466. Fabrication of DFM piping and pig traps. Continued drain-up of DFM-S. Installation of stripper piping on JP-5. Installation of pressure relief piping.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #31

Date:	Tuesday, May 21, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0715D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	8
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002	

Summary of Work Completed:	Installed piping at PH 466. Drained DFM-S pipeline. Excavated JP-5 pipeline at VP 9 for installation of pig trap. Installed pressure relief piping on Pier. Located JP-5 pipeline outside PH 1982 to determine location of pig traps. Fabricated DFM valve setting.
Agreed Scope Changes:	
Problems / Areas of Concern:	Hit telephone and conduit at VP9 that were not identified. Will discuss with Jim Rice as to how to repair if necessary.
General Comments:	
Work Planned Next 24 Hours:	Fabrication of pig traps. Removal of valves at DFM-S VP 6, 7 and 8. Welding of caps on pipeline.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #32**

Date:	Wednesday, May 22, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0716D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002	

Summary of Work Completed:	Welded caps on DFM VP 6, 7, and 8. Drained DFM-S pipeline. Excavated pipeline outside VP9 for trap installation. Located pipeline and determined locations of pig traps. Fabrication of traps.
Agreed Scope Changes:	
Problems / Areas of Concern:	JP-5 pipeline at PH 1982 is running down the road. Location of trap was determined to eliminate the need to excavate the road.
General Comments:	
Work Planned Next 24 Hours:	Installation of caps on 12 in VP6. Excavation of PL near PH 1982 for installation of traps. Fabrication of traps.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #33**

Date:	Thursday, May 23, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0717D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 15, 2002	June 15, 2002	June 15, 2002	

Summary of Work Completed:	Drained DFM- S at VP 6. Removed 12-inch valve at Tank 85 and installed blind flanges. Excavated PH 1982 to verify pipeline for installation of pig traps. Continued fabrication of pig traps.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Awaiting approval of funds for additional work at VP 9A, Tank 381, VP 7A DFM and valve setting.
Work Planned Next 24 Hours:	Tie-in of DFM-S VP 8. Fabrication of traps. Drain up of DFM-P pipeline.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #34**

Date:	Friday, May 24, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0718D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	9	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	

Summary of Work Completed:	Tied-in elbow in DFM-S VP 8. Fuels completed draining for DFM-P pipeline and readied for vac truck draining. Changed out insulation gasket on JP-54 VP 9 that was leaking. Assisted in refilling of JP-5 pipeline airfield portion. Excavated near PH 1982 to verify fit of pig traps. On-going fabrication of pig traps.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Location of pig traps has been determined and verified with Jim Rice. Existing utilities required some pipe to be bended to avoid interference.
Work Planned Next 24 Hours:	Completion of drain-up of DFM-P pipeline. X-ray to be on-site Tuesday. Continued fabrication of pig traps. Ready VP 24 and 56 for tie-in.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT– PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #35

Date:	Tuesday, May 28, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0722D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso and Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	NDT/X-Ray
Number of Staff on site:	1	9	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9	10
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Drained DFM-P fuels lines at VP 56 and 24. Cleaned-up VP 24 and 56 for tie-ins. Excavated around DFM-P VP 8 and Valve TFD-141 to determine necessary piping required for mods. Continued fabrication of pig traps. X-ray on -site to shoot fabrication.
Agreed Scope Changes:	
Problems / Areas of Concern:	DFM TFD-141 valve to be installed in VP 8 due to pipe and fittings across the road.
General Comments:	
Work Planned Next 24 Hours:	Verify drain-up of VP 56, Tie-in VP 56. Continue fabrication.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
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NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #36**

Date:	Wednesday, May 29, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0723D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Tied-in 12-inch and 6-inch above ground valve setting in DFM-P VP 56. Removed meter run on DFM-P pipeline. Installation of 10-inch valve on meter run in PH 1982. Fabricated pig traps.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Completion of 12-inch pup piece in VP 56. Installation of 12-inch straight pipe in VP 24 of DFM-P. Installation of meter run spool piece. Installation of valves at head of pier. Continued fabrication of pig traps.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #37

Date:	Thursday, May 30, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0724D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	

Summary of Work Completed:	Completed tie-in of straight piece of pipe in VP 56. Tied-in straight piece of pipe in VP 24. Continued fabrication of pig traps. 8 loads of dirt delivered from CBQ.
Agreed Scope Changes:	
Problems / Areas of Concern:	Rained a great deal throughout the day. VP 24 serves as a drainage point for all drain-off in the area. Continuous pumping of pit and surrounding area was required.
General Comments:	ROICC made an agreement with contractor at CGB to deliver loads of fill to areas that were on the route. Eight loads were delivered to VP 24, 25 and 8 at no additional charge.
Work Planned Next 24 Hours:	Tie-in of above ground valve setting at VP 24. Installation of weld caps at VP 23. Installation of valves and head of piers.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
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NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #38**

Date:	Friday, May 31, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0725D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	

Summary of Work Completed:	Completed welding on VP 56. Tied-in DTM-P valve setting in VP 24.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Pig trap closures and fittings arrived from US today.
Work Planned Next 24 Hours:	Completion of welding on VP 24. Tie-in of 8-inch risers on Pier. Replacement of valves at head of pier.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #39**

Date:	Saturday, June 1, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0726D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	

Summary of Work Completed:	Completed welding on DFM-P VP 24. Removed 16-inch valve and head of pier 1A. Excavated DFM-P VP8 and TFD 141 for valve settings. Removed stripper piping on DFM systems and installed new valves. Continued fabrication of pig traps. Exposed elbow at PH 1982 to determine elevated for trap tie-in.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Continue trap fabrication. Install 16-inch and 12-inch valve at pier on DFM systems. Weld and Install 4-inch valves on risers on DFM-P on Pier 1.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #40**

Date:	Monday, June 3, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0731D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	

Summary of Work Completed:	Installed 12" and 16" valves at head of Pier 1A. Welded on 4x8 reducers on DFM-P Pier 1. Installed 4" valves on DFM-P risers. Continued fabrication of pig traps. Excavated and demolished VP 9A.
Agreed Scope Changes:	Mod 2 notice to proceed received and work begun.
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Completion of installation of 4" camlock fitting on Pier 1. Installation of 12" valves on DFM-P PH 1982. Fabrication of DFM-S VP 8 valve setting. X-Ray to be on-site.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #41**

Date:	Tuesday, June 4, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0732D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	X-Ray/NDT
Number of Staff on site:	1	10	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	10	12	9	12
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Fabricate DFM-S VP 8 valve setting. Installed two 12-inch valves on DFM-P at head of PH 1982. Installed air eliminator on Pier 1. Welded cap on 8-inch in VP 23. Demolished DFM-P VP 8 for valve installation. Demolished JP-5 VP 9A. X-ray on site to shoot VP 24 and 56. Completed fabrication of pig trap barrels.
Agreed Scope Changes:	
Problems / Areas of Concern:	Rained entire day and shut down x-ray. They are schedule to return on Thurs and Friday. Rain is forecasted for entire week.
General Comments:	
Work Planned Next 24 Hours:	Tie-in DFM-S VP 8 valve setting. Weld second cap on VP 23. Install 16-inch valve at head of Pier 1.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #42

Date:	Wednesday, June 5, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0733D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	11	11	11	8
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Tie-in and installed DFM-S VP 8 valve setting. Removed 2-inch valves and installed blinds on DFM PH 1982. Prepared pit for Valve TFD-144 removal.
Agreed Scope Changes:	
Problems / Areas of Concern:	Removed blind flange from abandoned side of VP 23 and it was filled with Navy Special fuel oil. Discussed with Carlos Brown and Jim Rice that we would need assistance to remove fuel as it would contaminate our vac truck and need to be steamed cleaned. Also need a place to dispose of fuel. JA Jones was contacted and vac truck is out of service. They can provide a transport and Oil Response can provide a vac truck if they are given a place to dispose of fuel that is in their vac truck. Mr. Brown and Rice are making arrangements to drain PL. If this is not complete in more than a week it will delay the project clean up. Frank Cortez with ROICC called to request that we put up silt fence at VP 24. Requested why this had changed from the pre-implementation meeting when it was discussed that we do not need silt fence. He commented that environmental and ROICC feel it is necessary. Informed him that we did not have any along and it will take time to get. X-ray will be on-site Thurs to shoot welds and we can then backfill. Frank agreed that if we backfill by Thurs, silt fence was not necessary.
General Comments:	
Work Planned Next 24 Hours:	Remove Valve TFD-144 and weld in pipe pup. Continue fabrication of DFM-P VP 8. X-ray to be on-site.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #43**

Date:	Thursday, June 6, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0734D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	X-Ray/NDT
Number of Staff on site:	1	10	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	11	11	11	9	10
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Removed valve TFD-144 and tied in pipe pup. Fabricated DFM-P VP 8 setting. Coated and backfilled VP-24. X-ray on site to shot VP 56 and traps.
Agreed Scope Changes:	Stainless drip pans will not be fabricated.
Problems / Areas of Concern:	Misunderstanding of necessary pipelines needed for tanker schedule to arrive on June 12 may cause delay in work. VP 8 was scheduled to be tie-in on Monday, but will be needed for transfer prior to tanker arrival. Jim Rice is attempting to delay tanker. If tanker cannot be delayed, we will have to move to the JP-5 PL tie-ins after drain-up of JP-5 PL at the beginning of the week. DFM PL will than need to be drained up again after tanker departure.
General Comments:	Heavy rains continue to fall throughout the week. There is a great deal of mud to contend with and all valve pits and excavations are needed to be drained several times throughout the day.
Work Planned Next 24 Hours:	Ready Pipe pup pit for x-ray. Fabricate VP-8 setting. Install DFM-P valve at head of pier 1. Coat and backfill DFM-S VP8 and excavation. X-ray to be on site to shoot VP 8 and pipe at valve removal.

CONTRACTOR WORK SUMMARY



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NAVSTA ROOSEVELT ROADS, PUERTO RICO

SITE WORK DAY #44

Date:	Friday, June 7, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0735D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	X-Ray/NDT
Number of Staff on site:	1	10	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	10	11	9	10
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Installed DFM-P valve and head of Pier 1. Fabricated DFM-P VP 8 setting. X-ray on-site to shoot valve removal and DFM-S VP 8 vales setting. Traps and valves settings taken to painter sand blasted and primed. Drained JP-5 pipeline for tie-ins.
Agreed Scope Changes:	
Problems / Areas of Concern:	Bends and valves for traps arrived at end of day. (2) 12" valves delivered were reduced port rather than full port. Will call EVSI on Monday to figure out mistake and get correct valves.
General Comments:	Personnel on base had day off for earth day. No assistance was given by fuels for drain-up of JP-5 PL.
Work Planned Next 24 Hours:	Remove and install new valve at tank 83. Prep DFM-P VP 8 for tie-in. Fabricate VP 8 valve setting.



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NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #45

Date:	Saturday, June 8, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0736D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Removed and installed new valve at Tank 83. Prepped DFM-P VP 8 for tie-in. Drain JP-5 pipeline. Installed pressure relief valves on DBB valve on DFM-P and DFM-S new valves. Continued Fabrication of DFM-P VP 8 setting
Agreed Scope Changes:	
Problems / Areas of Concern:	Still awaiting Fuels to drain up N/S line at VP 23 to weld cap and backfill valve pit.
General Comments:	
Work Planned Next 24 Hours:	Tie-in DFM-P VP 8. Prepare DFM-P and DFM-S for refill. Backfill of both VP-8 and VP 56.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
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**CONTRACTOR WORK SUMMARY
SITE WORK DAY #46**

Date:	Monday, June 10, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0739D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Tied-in DFM-P VP 8 12-inch valve setting. Installed pressure relief valves on all new DBB valves on DFM systems. Fabricated pig trap settings. Continued drain up of JP-5 pipeline.
Agreed Scope Changes:	
Problems / Areas of Concern:	Full port 12-inch DBB valves have a 14-16 week lead. Spool piece of reduced port valve will be installed for temporary installation of traps.
General Comments:	Fuels drained up N/S fuel oil out of pipeline in VP 23.
Work Planned Next 24 Hours:	Remove DFM 12-inch vertical pipe at head of pier. Cap N/S fuel oil line in VP 23. Fabrication of pig traps. Verification that DFM-P and DFM-S pipelines are ready for refill in the afternoon.



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NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #47**

Date:	Tuesday, June 11, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0740D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	X-Ray/NDT
Number of Staff on site:	1	10	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	10	12	9	12
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Removed 12-inch vertical piping and capped 4-inch at head of pier, coated and backfilled. Capped 6-inch at PH 466. Capped N/S line at VP 23, coated and backfilled. Installed air eliminators at crossover on pier 1A. Backfilled DFM-S VP8 and valve removal excavation. Verified DFM system ready for refill in morning. X-ray on site to shoot DFM-P VP 8, and traps. Continued fabrication of traps. Continued drain up of JP-5 system. Installed pressure relief valves on DBB valve on DFM and JP-5 system.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Fuels to refill DFM system in morning. Assist in verifying that there are no leaks on DFM system. Begin installation of trap at PH 1982. Continue drain-up of JP-5 system.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #48

Date: Wednesday, June 12, 2002 **Job No:** 065/07074-18
Delivery Order No: 7074-18 **Site Report No:** 707418-G11-0741D
Project Title: Pipeline Repairs and Modifications **Work Location:** Roosevelt Roads, Puerto Rico
COTR: Terri Regin **Contract No:** N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	15	14	14	13
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Cut elbow at PH 1982 for trap installation. Drained up throughout the day. Capped to leave for night. Tighten bolts for DFM refill.
Agreed Scope Changes:	Gate valves removed from work will be used on traps to allow for pigging while awaiting delivery of full port twin seal valves.
Problems / Areas of Concern:	Directions were not followed by Cypress Creek during tie-in at PH 1982. 2-inch tap was to be installed at low point and tapped to allow for drain up prior to cutting pipe. While Worley was on the pier tightening some nipples, a hose was inserted into vertical pipe and through elbow and determined that product was not there. Cold cut was made and the line was 1/3 of product. Product was contained, but vac truck was filling and cut could not be controlled while truck off loaded. Fuels supplied a truck to off-load vac truck to assure to product would get on the ground. Once drain-up got down to a trickle, the elbow was cut off, a plumbers plug installed and a cap welded on for the evening. Discussions will take place with Cypress Creek to assure that this will not happen again and directions are followed.
General Comments:	
Work Planned Next 24 Hours:	Tie-in PH 1982 trap. X-ray to be onsite.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
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CONTRACTOR WORK SUMMARY
SITE WORK DAY #49

Date:	Thursday, June 13, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0742D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	X-Ray/NDT
Number of Staff on site:	14	13	12	10.5	6
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Continued Tie-in of trap at PH 1982. X-Ray on-site. Coated DFM-P VP 8.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Continue tie-in of trap at Ph 1982. Backfill DFM-P VP 8.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #50**

Date:	Friday, June 14, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0743D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	X-Ray/NDT
Number of Staff on site:	1	10	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	11	12	9	10
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Installed 6" kicker line and valve in VP 9 for trap. Continued fabrication on trap. Coated and backfilled trap connection near road at PH 1982 and VP 56. X-ray on site. Continued drain-up at VP 3 of airfield portion. Installed pressure relief on and around valves at head of piers.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Tie-in of remainder of trap at VP 9. Installation of pressure relief piping at head of pier valves.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #51**

Date:	Saturday, June 15, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0744D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	11.5	11	8
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Completed installation of trap at VP 9. Installed pressure relief piping on 4-inch valves along pier 1. Completed backfill at PH 1982 trap. Excavated for tie-in of tee at PH 1982. Continued drain-up of JP5 airfield portion.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	New operator and swamper for Cypress Creek arrived on site to replace two that left on Friday.
Work Planned Next 24 Hours:	Weld TOR and tap 16-inch line on JP5 at PH 1982. Tie-in tee at JP5 VP 9A. Continue pressure relief piping on new valves.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #52**

Date:	Monday, June 17, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0747D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	15	15	11	10
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Installed two 6-inch valves in Tank 381 Pump House. Prepped VP 9A for tie-in. Completed valve pressure relief piping on Pier 1. Continued drain-up of JP-5 pipeline. Cleaned up backfill around VP 8, 24, and 25.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Fuel on the tank side of Tank 84. Needs to be drained to remove valve.
Work Planned Next 24 Hours:	Begin tie-in of VP 9A. Coat and backfill trap at VP 9. Continue drain-up of JP-5 pipeline. Install pressure relief tubing on new valves. Remove 6-inch valve from tank 84.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #53

Date:	Tuesday, June 18, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0748D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	X-Ray/NDT
Number of Staff on site:	1	10	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	12	10	12	10
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Removed 6-inch valve from tank 84. Completed installation of 6-inch valves on tank 381. Coated and backfilled VP 9 trap. Complete pressure relief piping on pier valves, VP 56 and PH 1982. Continued drain-up of JP 5 pipelined. Began welding and fitting of stripper piping in VP 27. X-Ray on-site.
Agreed Scope Changes:	
Problems / Areas of Concern:	JP-5 drain-up has been ongoing for 4 days. Pipeline was previously drained for tie-ins at PH 1982. Fuel is again at this location and still draining.
General Comments:	
Work Planned Next 24 Hours:	Tie-in VP 9A. Complete backfill of VP9 trap. Continued drain-up of JP5 pipeline. Continue installation of pressure relief piping on new DBB valves.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #54**

Date:	Wednesday, June 19, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0749D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	11	10	10	8
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Installed 6-inch tee section of VP 9A. Continued on stripper piping in VP 27. Backfilled and cleaned up trap at VP 9. Cleaned up job site of steel and pipe debris to haul off to DRMO. Completed drain-up of JP 5 pipeline.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Install 16x12 tee at PH 1982 trap. Continue on stripper piping. Bolt up trap at PH 1982. X-ray to be on-site.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #55**

Date:	Thursday, June 20, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0750D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	X-Ray/NDT
Number of Staff on site:	1	10	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	12	10	12	9	10
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002	June 30, 2002

Summary of Work Completed:	Tied-in 16-inch tee on PH 1982 Trap. Welded stripper piping on DFM VP 27. Installed vent down turns on 3/4" valves on above ground settings. Coated and backfilled PH 1982 trap. Painted piping in VP 3. X-ray on-site. Continued drain up on AV-gas line at VP 6. Installed supports at PH 466.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Tie-in 12-inch tee at VP 9A. Bolt up trap barrel on PH 1982 trap. Continue installation of small piping on above ground settings.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #56

Date:	Friday, June 21, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0768D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 28, 2002	June 28, 2002	June 28, 2002	June 26, 2002

Summary of Work Completed:	Tied-in 12-inch tee at VP 9A. Drained 12-inch at VP 6. Bolted on trap at PH 1982. Installed 2-inch and ¾-inch piping on air vents. Painted VP 3.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Complete tie-in of trap at PH 1982. Continue drain-up of 12-inch at VP 6. Fabricated stripper piping. Primer pier valves and pipe.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #57**

Date:	Saturday, June 22, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0769D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 28, 2002	June 28, 2002	June 28, 2002	June 26, 2002

Summary of Work Completed:	Completed tie-in of trap at PH 1982. Continued drain of 12-inch at VP 6. Fabricated stripper piping. Primed pier valves and pipe. Drained JP5 at VP 7A. Installed supports and concrete on trap at VP 9.
Agreed Scope Changes:	
Problems / Areas of Concern:	VP 7A is clogged and drain-up cannot be done. There is not low point in the vicinity to allow for a sufficient drain-up to remove 2-inch valve. 2-inch permanent TOR tap will need to be installed outside the pit to complete the drain-up.
General Comments:	
Work Planned Next 24 Hours:	Weld 12-inch caps on VP 6. Install 2-inch TOR at VP 7A. Install supports at PH 1982. Coat and backfill VP 9A. Clean up of valve sites. Spread gravel. X-ray to be on-site.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #58**

Date:	Monday, June 24, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0772D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4	#5
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering	Alonso & Carus
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck	X-Ray/NDT
Number of Staff on site:	1	10	1	1	3
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	11	10	11	8	6
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4	#5
Percentage of Work Complete:					
Anticipated Completion Date:	June 28, 2002	June 28, 2002	June 28, 2002	June 26, 2002	June 24, 2002

Summary of Work Completed:	Welded 12-inch caps on VP 6. Installed 2-inch TOR at VP 7A fo0r drain-up. Installed supports at PH 1982. Clean up of valve sites. Spread gravel at both VP-8's and VP 9. Primed pier valves. X-ray to be on-site.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Coat and backfill VP 9A. Install barricades at valves settings. Clean-up job site. Installed piping at VP 27. Drain up JP-5 PL. Prime and paint.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #59**

Date:	Tuesday, June 25, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0773D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 28, 2002	June 28, 2002	June 28, 2002	June 26, 2002

Summary of Work Completed:	Continued drain-up of VP 7A. Spread gravel at above ground settings. Primed pier valves. Completed supports. Fabricated 2-inch piping for VP 7A.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Continued painting. Install 2-inch valve and piping on VP 7A. Install bollards. Spread gravel at valve settings. Job walkthrough.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

CONTRACTOR WORK SUMMARY
SITE WORK DAY #60

Date:	Wednesday, June 26, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0774D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	9
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 28, 2002	June 28, 2002	June 28, 2002	June 26, 2002

Summary of Work Completed:	Continued painting. Installed 2-inch valve and piping on VP 7A. Install bollards. Spread gravel at valve settings. Installed concrete below valves at head of pier. Installed 2-inch down comers on Pier 1A air eliminators. Job walkthrough.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Pressure relief to be piped across the twin seal valves. Job completion walkthrough complete.
Work Planned Next 24 Hours:	Continue clean up of site. Prime and paint pump house. Refill JP-5 pipeline.



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DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #61**

Date:	Thursday, June 27, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0775D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3	#4
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom	Riviera Engineering
General Type of Work:	Project Engineer	Piping	Inspector	Vac Truck
Number of Staff on site:	1	10	1	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10	5
Job Safety Meeting:	YES / NO	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3	#4
Percentage of Work Complete:				
Anticipated Completion Date:	June 28, 2002	June 28, 2002	June 28, 2002	June 26, 2002

Summary of Work Completed:	Installed 2-inch valve and riser on VP 7A. Continued painting in PH 1982. Installed pressure relief valves on DBB valve on JP5. Cleaned up site. Spread remainder of gravel.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	
Work Planned Next 24 Hours:	Painting of piping systems. Clean up of site and removal of all equipment.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
DAILY PRODUCTION SITE REPORT- PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

**CONTRACTOR WORK SUMMARY
SITE WORK DAY #62**

Date:	Friday, June 28, 2002	Job No:	065/07074-18
Delivery Order No:	7074-18	Site Report No:	707418-G11-0776D
Project Title:	Pipeline Repairs and Modifications	Work Location:	Roosevelt Roads, Puerto Rico
COTR:	Terri Regin	Contract No:	N47408-99-D-8014

CONTRACTOR / SUBCONTRACTOR DETAILS:

Contractor Number:	#1	#2	#3
Contractor Name:	Worley International Inc	Cypress Creek	DiversiCom
General Type of Work:	Project Engineer	Piping	Inspector
Number of Staff on site:	1	10	1
Work Location:	NAVSTA Fuels Depot	NAVSTA Fuels Depot	NAVSTA Fuels Depot
Hours Worked Today:	10	10	10
Job Safety Meeting:	YES / NO	YES / NO	YES / NO
Lost Time Incident:	YES / NO	YES / NO	YES / NO
Hazardous Material Release:	YES / NO	YES / NO	YES / NO

NOTE: "If yes, attach a copy of safety meeting minutes, a copy of the completed OSHA report, a full report of the incident, and/or a list of materials received."

CONTRACTOR / SUBCONTRACTOR WORK SUMMARY:

Contractor Number:	#1	#2	#3
Percentage of Work Complete:			
Anticipated Completion Date:	June 28, 2002	June 28, 2002	June 28, 2002

Summary of Work Completed:	Completed clean up of job site. Continued to prime and paint valve setting and traps. Refilled JP-5 PL. Leak on 12-inch valve in Tank 381 that was not worked on by Worley. Replaced gasket and refilled pipeline.
Agreed Scope Changes:	
Problems / Areas of Concern:	
General Comments:	Two people will be staying on-site through Tuesday to complete painting. Work to be completed during pressure testing and pigging includes PR tubing and drip pans on pier.
Work Planned Next 24 Hours:	Fly Home.



NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO

J-15 Worley Weekly Production Reports



DATE April 29, 2002

TO Terri Regin

FROM Jeanette Edge

COPY Kirsten Glesne, Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC)

PROJECT 65/07074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending April 27, 2002

DOC NO 0707418_G45_0676D

Work Accomplished This Week:

Day	Date	Activity Description
Tuesday	04/16/02	<ul style="list-style-type: none">• Set up lay down area for fabrication• Obtained permits for access on site• Obtained dig permit• Introductory meeting to discuss modifications to be completed, and order of completion• Some equipment arrived on site and was off loaded
Wednesday	04/17/02	<ul style="list-style-type: none">• Concrete cover demolished in VP25• Scheduling Meeting• Various pits were drained of rainwater.• Two cargo containers arrived late in the day.
Thursday	04/18/02	<ul style="list-style-type: none">• Revised Schedule Meeting• Various pits were drained of rainwater.• Unloaded cargo containers.• VP25 was demolished. Construction halted due to hot electrical wire in VP• Fire Department called out to investigate
Friday	04/19/02	<ul style="list-style-type: none">• On site fabrication began.• Given okay from fire Department to continue demolition of VP 25 after JA Jones disconnected power at transformer. Continued demolishing VP25.• Removed 12" DB&B valve from AV gas line, VP 6C.
Saturday	04/20/02	<ul style="list-style-type: none">• Removed valves from AV gas line, VP 6A, VP 6B• Continued fabrication



Day	Date	Activity Description
Monday	04/22/02	<ul style="list-style-type: none"> Removed 6" DB&B valve from Tank 1088 Excavated around VP 56 DFM. Continued fabrication Began excavation of VP 4 on JP-5 pipeline.
Tuesday	04/23/02	<ul style="list-style-type: none"> Completed demolition of VP 4 JP-5 Pulled (2) 12" DB&B Valves from Tank 1080. Some bolts were removed off valves in Tank 1082. Began excavation of VP 5. Entire pit was not demolished because a power pole in near the excavation. Contacted Roberto Colon to discuss options for power pole. Continued fabrication.
Wednesday	04/24/02	<ul style="list-style-type: none"> Demolished VP 7 DFM-S. Began demolishing VP 8/9 DFM-S, hit a CP line. JA Jones will investigate the CP connection and line did not break. Removed (2) 12" DB&B valves from Tank 1082. Continued fabrication
Thursday	04/25/02	<ul style="list-style-type: none"> Demolished VP 6 and VP 8/9 DFM-S Removed 6" DB&B from Tank 1080 Hand dug VP 24 to find conduit buried in the area. Conduit was found to be buried in concrete and marked for excavation. Drained out VP 56 and DFM-S line (by fuels) Cleaned up VP 4, 5, 6, 7, 8, 25 and loaded concrete into roll of tanks for disposal. Continued fabrication.
Friday	04/26/02	<ul style="list-style-type: none"> Demolished and cleaned up VP 56 Continued fabrication. Dug around buried tee determined that is was not part of the DFM line as previous thought. Discussed with fuels to understand were 12-inch vertical pipe and 4" pipeline connected.
Saturday	04/27/02	<ul style="list-style-type: none"> Continued fabrication Continued excavation and demolition around VP 24. Pipeline locations were not as discussed. Broke concrete on top to help investigate location of existing pipelines. Loosened every other bolt at PH 466.

Note:

Weather - unless noted otherwise, weather is hot and dry.

Planned Work for Next Period

- Begin drain-up of DFM-Secondary pipeline with vac truck at PH 466, VP 25 and VP 7.
- Begin dismantling of PH 466 and installing new pipe and valves.
- Install valves and piping on DFM-Secondary Pier 1 and 1A pipelines.
- Remove valves and tie-in new piping at VP 25



- Begin drain up of JP-5 pipeline from VP 9 to airfield after completion of tank transfer on May 3.
- On going fabrication of pipe and fittings outside Fuels building.
- On-going demolition of VP 23 and VP 24.
- Clean up of excavation and pit demolition areas to remove concrete and rebar.
- X-ray of fabrication piping on Monday and Wednesday near Fuels building.

Concerns/Issues/Comments

- Attached is a copy of the percentage progress update by task.
- Ran into problem in VP 25 when hammer hoe hit a live wire in a conduit. JA Jones traced out conduit and disconnected power to VP 24, 25 and PH 466 pumps. Worley will test all wire prior to any excavation or demolition.
- Problem discovered when digging around buried tee. 12-inch blind is attached to a vertical piece of 12-inch pipe with a 4-inch flange connection on each sided. Vertical component is more than 8-feet deep. This will be investigated when the DFM line is drained.
- When digging DFM-S VP 8/9 the track hoe hit a CP wire in the ground.
- Upon investigation of VP 24, the flow diagram is not correct. Pipelines will be traced out by pigging pipelines. Once routing of pipelines is determined, a design for the valves settings will be finalized.
- Still awaiting access to airfield to investigate JP-5 VP 2. LT Bergado will is verifying if class is necessary.

Safety Statistics:

- No safety incidents recorded to date.
- Cypress Creek safety meetings held every morning at 7:00 am.
- QC meeting took place at the Public Works Building on April 25, 2002
- QC meeting took place at the Fuels Depot Building April 26, 2002



DATE May 4, 2002

TO Terri Regin

FROM Jeanette Edge

COPY Kirsten Glesne, Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC)

PROJECT 065/07074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending May 4, 2002

DOC NO 0707418_G45_0688D

Work Accomplished This Week:

Day	Date	Activity Description
Monday	04/29/02	<ul style="list-style-type: none">• Vac truck began draining DFM-S line at PH 466.• Removed some piping and equipment at PH 466.• Excavation and demolition of VP 24.• X-Ray above ground materials for JP-5 and DFM-S lines.• Continued fabrication and repair one weld as indicated by X-ray.
Tuesday	04/30/02	<ul style="list-style-type: none">• Vac truck continued draining PH 466 and began draining low point on DFM-S line at VP7, as well as VP25 Pier 1.• Demolition of VP23, and part of VP24• All above ground piping for JP-5 and DFM-S were sent to Steel and Pipe for sandblasting, primer, and paint.• Backfill of VP24 for safety reasons.• Continued fabrication.
Wednesday	05/01/02	<ul style="list-style-type: none">• Vac truck continued to drain at PH 466 and VP7.• Transfer of fuel between Tank 83 and Tank 1996.• Isolation of VP56 DFM-S• Dismantling of PH 466 piping• Excavation of VP24.• Continued fabrication.
Thursday	05/02/02	<ul style="list-style-type: none">• Welded 2" nipple in VP4.• Cleaned up VP24 for working conditions.• Remove valves and tie-in new piping at VP 25• QC meeting at Public Works Building, ROICC Office.



Day	Date	Activity Description
Friday	05/03/02	<ul style="list-style-type: none"> Welded 4" cap in VP25. Meeting with public works regarding pole that is near VP 5. Will notify us with procedures to follow. Removed valve pit cover from VP2 (Air Field) Removed bolts from valves on Pier 1 and 1a. Welded in 4"x6" reducer on Pier 1. Vac truck draining DFM-S line at VP27. Continued fabrication.
Saturday	05/04/02	<ul style="list-style-type: none"> Continued to remove bolts from Pier 1, removed valve and blind flanged opening. Welded second 4"x6" reducer, installed camlocks, and welded thread-o-let for air eliminator. Vac truck draining DFM-S line at VP 6. Packing was leaking at VP7 on the 2 1/2" drain valve. Pipeline was secured, cracked flanges on the line, line was found to be clogged, 2" drain valve was removed and installed blind flange. Visit to Steel and Pipe to verify quality.

Note:

Weather - unless noted otherwise, weather is hot and dry.

Planned Work for Next Period

- Complete drain-up of DFM-S pipeline at VP 6, 7, and 8.
- Remove tee at VP 8 to secure VP 6 and 7 and DFM-S and install blind flanges at valves.
- Cold cut pipeline and weld on caps at VP 6 and 7 on DFM-S pipeline
- Fuels to drain JP-5 pipeline and hand over to Worley.
- Complete drain-up with vacuum truck of JP-5 pipeline from flight line to VP-9.
- Secure JP-5 pipeline form VP9 to flight lines by removing ball valve and installing blind flanges at VP 9.
- Begin tie-in of VP 2, 3, 4, 5 and 6 on JP-5 after completion of drain-up.
- Installation of pressure relief piping and air eliminators on piers 1 and 1A.
- X-ray of fabricated and tie-in, VP 25 and Pier 1.

Concerns/Issues/Comments

- Attached is a copy of the percentage progress update by task.
- Concern regarding location of power line and communication poles located near VP5. Worley is awaiting resolution from Public Works regarding this issue.



- Located in the pit was a valve and a flanged elbow. A flanged spool piece is going to have to be added to this modification unless significant excavation around the pit is done in order to remove the flanges.

Safety Statistics:

- No safety incidents recorded to date.
- Cypress Creek safety meetings held every morning at 7:00 am.
- QC meeting took place at the Public Works Building on May 2, 2002



DATE May 11, 2002

TO Terri Regin

FROM Jeanette Edge

COPY Kirsten Glesne, Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC)

PROJECT 065/07074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending May 11, 2002

DOC NO 0707418_G45_0681D

Work Accomplished This Week:

Day	Date	Activity Description
Monday	05/06/02	<ul style="list-style-type: none">• Continue to drain DFM-S line. VP7 installed a 2" nipple and tapped it.• Began draining JP-5 line at VP6 and found that the drain was clogged, so moved to VP3. Approximately 3000 gallons of fuel was removed.• Cut bolts on pier 1 and 1A and replace with new bolts on the 16" lines.• Continue fabrication.
Tuesday	05/07/02	<ul style="list-style-type: none">• Installed skillets in AF filters.• Continued drain up at VP3 JP-5, approx. 1690 gallons of fuel.• Continued to cut bolts on Pier 1 and 1A and replace with new bolts on the 16" lines.• Removed pumps and motors from pump house 466.• Continued excavation of vertical 12" line near VP27.• Steel and Pipe delivered piping that was primed and painted.
Wednesday	05/08/02	<ul style="list-style-type: none">• X-Ray on site.• Moved pumps and motors from pump house 466 to the drum storage.• Breaking bolts at pump house 1982.• Continued fabrication.• Removed existing valves and piping, and installed blind flanges in VP 3.• Installed skillets and spool piece in VP 6.



Day	Date	Activity Description
Thursday	05/09/02	<ul style="list-style-type: none">Continued fabrication.Applied primer and coating in VP 25 and back filled pit.Installed a 2" nipple in VP24.Continued breaking bolts at pump house 1982.Removed roof from VP 10 and VP 11 near tank farm.Continued drain up of JP-5 from VP 9 to Pier 1.QC meeting at ROICC Office.
Friday	05/10/02	<ul style="list-style-type: none">Finished draining JP-5 line.Breaking bolts at pump house 1982, changed out two 12" DB&B valves and removed a 16" DB&B and replaced it with blind flanges.Tie-in at VP24, welded piping with one bead and a hot pass, installed new 12" DB&B valve JP-5 line
Saturday	05/11/02	<ul style="list-style-type: none">Changed out two 16" DB&B valves in pump house 1982.Finished welding piping in VP24, JP-5 line.

Note:

Weather - unless noted otherwise, weather is hot and dry.

Planned Work for Next Period

- Tie in at VP 9 and install valves.
- Tie in pipe in VP 5.
- Replace valves at pier 1 and 1A.
- Replace valves in VP 10.
- Remove valves in VP 11 and install blinds.
- Install new valves and spool piece at meter run in pump house 1982
- Tie in at VP 4.
- Tie in valves and reducers on pier 1 and 1A.
- Install cross connect piece on pier 1A.
- X-ray fabricated and tied in pieces.
- Fabrication of pig traps.

Concerns/Issues/Comments

- Attached is a copy of the percentage progress update by task.

Safety Statistics:

- No safety incidents recorded to date.
- Cypress Creek safety meetings held every morning at 7:00 am.
- QC meeting took place at the Public Works Building on May 9, 2002



DATE May 19, 2002

TO Terri Regin

FROM Kirsten Glesne

COPY LT. Feliz (Fuels), Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC),

PROJECT 065/7074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending May 19, 2002

DOC NO 0707418_G45_0712D

Work Accomplished This Week:

This week saw the completion of the necessary modifications of the JP-5 Pipe line that will allow it

Day	Date	Activity Description
Monday	05/13/02	<ul style="list-style-type: none">• JP-5 VP9 - Drained VP 9 for tie-in, removed valves and dresser couplings, installed new 8-inch DBB valve, welded bead and hot pass on 12-inch spool piece, installed new 12-inch valve.
Tuesday	05/14/02	<ul style="list-style-type: none">• Completed welding on 12-inch line in JP-5 VP9.• Drained up JP5-VP5 and completed tie-in of new pipe with a bead and hot pass on welds. Waited on JA Jones till 9:30 am to have sufficient equipment to support communication pole.• Continued fabrication of DFM VP 24.
Wednesday	5/15/02	<ul style="list-style-type: none">• Welded on 8-inch pipe and flange in J-5 VP9.• Drained-up and removed 12-inch valve in JP-5 VP11.• Removed valve in VP10. Pipe was under stress and could not be separated to install new valve. Flange will have to be cut and new one installed. Blind flanges were installed until flange arrives.• Installed pipe spool in PH 1982 meter run on JP-5 pipeline.



Day	Date	Activity Description
Thursday	5/16/02	<ul style="list-style-type: none">• Welded two reducers on JP-5 Pier 1 and installed valves.• Tied-in JP-5 VP4 because of change in schedule and need for transfer of product to airfield prior to tank arrival.• Repaired weld on VP 5• Installed 16-inch valve on JP-5 pipeline valve at head of Pier 1.• X-ray crew on site shot JP-5 VP 4, 5, 9, and 24.
Friday	5/17/02	<ul style="list-style-type: none">• Removed valve in VP2 JP-5 Pipeline and welded spool piece• Welded 4-inch reducers on Pier 1 and installed 4-inch valve on 4 risers• Installed pressure relief piping on pier around 16-inch valves.• Tape coated VP4 and VP5 on JP-5 pipeline
Saturday	5/18/02	<ul style="list-style-type: none">• Welded on flange on JP-5, VP 10 and installed new 12-inch valve.• Installed stripper piping in VP 27 JP-5 Pipeline• Welded ¾" relief in JP-5 VP 24• Installed spool piece in VP 2 JP-5• Removed skillets at airfield filter banks and VP6 to allow for JP-5 pipeline to be put back in service• Taped and backfilled VP 24. Backfilled VP 4 and 5.• JP-5 pipeline ready for refill and return to service.

Note: Weather - unless noted otherwise, weather is 85 and sunny.

Planned Work for Next Week

- Re-commissioning of JP-5 pipelines on Monday for tanker arrival on Tuesday.
- Completion of pressure relief piping on JP-5 pipeline
- Drain-up of remainder DFM-S Pipeline
- Drain-up of DFM pipeline be Fuels and Worley
- Installation of piping in DFM PH 466
- Tie in of DFM VP 9
- Installation of 16-inch and 12-inch valves at head of pier
- Re-commissioning of DFM-S Pipeline.
- Installation of valves and piping in DFM PH 1982.



- Tie-in of DFM VP 56 and or VP 24.
- Fabrication of pig trap piping

Concerns/Issues/Comments

- Attached is a copy of the percentage progress update by task.
- Additional welder will be brought in on May 20 to expedite the fabrication of the pig traps and eliminate the need to stand-by time of the remainder of the construction crew.

Safety Statistics:

- No safety incidents recorded to date.
- Cypress Creek safety meeting held daily at 7:00 am



DATE May 27, 2002

TO Terri Regin

FROM Kirsten Glesne

COPY LT. Feliz (Fuels), Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC),

PROJECT 065/7074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending May 26, 2002

DOC NO 0707418_G45_0719D

Work Accomplished This Week:

Day	Date	Activity Description
Monday	05/20/02	<ul style="list-style-type: none">• Walked through JP-5 pipeline and tighten all bolts and fittings. Refilled JP-5 from tank to pier.• Welded out VP 10.• Installed air eliminators on Pier 1.• Installed cross connect on Pier 1A.• Removed 6-inch valve and installed skillets at VP 11.• Removed debris around valve pits for disposal.• Continued fabrication on DFM pipeline.• Drained up DFM-S.
Tuesday	05/21/02	<ul style="list-style-type: none">• Installed piping at PH 466.• Drained DFM-S pipeline.• Excavated JP-5 pipeline at VP 9 for installation of pig trap.• Installed pressure relief piping on Pier.• Located JP-5 pipeline outside PH 1982 to determine location of pig traps.• Fabricated DFM valve setting. Additional welder arrived on site to assist in fabrication of pig traps and tie-ins.



Day	Date	Activity Description
Wednesday	5/22/02	<ul style="list-style-type: none">• Welded caps on DFM VP 6, 7, and 8.• Drained DFM-S pipeline.• Excavated pipeline outside VP9 for trap installation. Located pipeline and determined locations of pig traps.• Fabrication of traps.
Thursday	5/23/02	<ul style="list-style-type: none">• Drained DFM-S at VP 6.• Removed 12-inch valve at Tank 85 and installed blind flanges.• Excavated PH 1982 to verify pipeline for installation of pig traps.• Continued fabrication of pig traps.
Friday	5/24/02	<ul style="list-style-type: none">• Tied-in elbow in DFM-S VP 8. Added additional piping to eliminate corrosion that existed on pipeline.• Fuels completed draining for DFM-P pipeline and readied for vac truck draining.• Changed out insulation gasket on JP-54 VP 9 that was leaking. Assisted in refilling of JP-5 pipeline airfield portion.• Excavated near PH 1982 to verify fit of pig traps. On-going fabrication of pig traps.

Note: Weather - unless noted otherwise, weather is 85 and sunny.

Planned Work for Next Week

- Drain-up of DFM-P Pipeline
- Tie-in of VP 24 and 56 on DFM Pipeline
- Installation of 12-inch and 16-inch valves and head of pier.
- Re-commissioning of DFM-S pipeline
- Installation of (2) 12-inch valves inside PH 1982 on DFM pipeline
- Installation of 10-inch valves and piping at meter run inside PH 1982.
- Continued fabrication of pig traps.

Concerns/Issues/Comments

- Attached is a copy of the percentage progress update by task.



- Additional work to be approved at tank 381, valve settings and removal of VP 9A. Anticipated to add two weeks to construction time. Current completion date is anticipated around June 30, 2002.

Safety Statistics:

- No safety incidents recorded to date.
- Cypress Creek safety meeting held daily at 7:00 am



DATE June 2, 2002

TO Terri Regin

FROM Kirsten Glesne

COPY LT. Feliz (Fuels), Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC),

PROJECT 065/7074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending June 2, 2002

DOC NO 0707418_G45_0727D

Work Accomplished This Week:

Day	Date	Activity Description
Monday	05/27/02	<ul style="list-style-type: none">• Holiday – No Work
Tuesday	05/28/02	<ul style="list-style-type: none">• Drained DFM-P fuels lines at VP 56 and 24.• Cleaned-up VP 24 and 56 for tie-ins.• Excavated around DFM-P VP 8 and Valve TFD-141 to determine necessary piping required for mods.• Continued fabrication of pig traps.• X-ray on –site to shoot fabrication.
Wednesday	5/29/02	<ul style="list-style-type: none">• Tied-in 12-inch and 6-inch above ground valve setting in DFM-P VP 56.• Removed meter run on DFM-P pipeline. Installed 10-inch valve on meter run in PH 1982.• Fabricated pig traps.



Day	Date	Activity Description
Thursday	5/30/02	<ul style="list-style-type: none">• Completed tie-in of straight piece of pipe in VP 56.• Tied-in straight piece of pipe in VP 24.• Continued fabrication of pig traps. 8 loads of dirt delivered from CBQ.• Rained a great deal throughout the day. VP 24 serves as a drainage point for all drain-off in the area. Continuous pumping of pit and surrounding area was required.• ROICC made an agreement with contractor at CGB to deliver loads of fill to areas that were on the route. Eight loads were delivered to VP 24, 25 and 8 at no additional charge.
Friday	5/31/02	<ul style="list-style-type: none">• Completed welding on VP 56.• Tied-in DTM-P valve setting in VP 24.
Saturday	6/1/02	<ul style="list-style-type: none">• Completed welding on DFM-P VP 24.• Removed 16-inch valve and head of pier 1A.• Excavated DFM-P VP8 and TFD 141 for valve settings.• Removed stripper piping on DFM systems and installed new valves.• Continued fabrication of pig traps.• Exposed elbow at PH 1982 to determine elevated for trap tie-in.

Note: Weather - unless noted otherwise, weather is 85 and sunny.

Planned Work for Next Week

- Installation of 16-inch and 12-inch valves at head of Piers 1 and 1A.
- Installation of 4x8 reducers and 4-inch valves on Pier 1.
- Installation of air eliminators and relief piping on DFM system on Piers.
- Installation two 12-inch valves and head of PH 1982.
- Removal of 12-inch vertical piping at head of pier and welding of caps on 4-inch lines.
- Installation of valve setting on DFM-S VP 8.
- Installation of caps on VP 23.
- Refilling of DFM-S pipeline to be done on Thursday for ship arrival on Friday.
- Continued fabrication of pig traps and valve settings.



Concerns/Issues/Comments

- Attached is a copy of the percentage progress update by task.

Safety Statistics:

- No safety incidents recorded to date.
- Cypress Creek safety meeting held daily at 7:00 am



DATE June 9, 2002

TO Terri Regin

FROM Kirsten Glesne

COPY Lt. Feliz (Fuels), Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC),

PROJECT 065/7074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending June 9, 2002

DOC NO 0707418_G45_0737D

Work Accomplished This Week:

Day	Date	Activity Description
Monday	06/03/02	<ul style="list-style-type: none">• Installed 12" and 16" valves at head of Pier 1A.• Welded on 4x8 reducers on DFM-P Pier 1. Installed 4" valves on DFM-P risers.• Continued fabrication of pig traps.• Excavated and demolished VP 9A.• Mod 2 notice to proceed received and work begun.
Tuesday	06/04/02	<ul style="list-style-type: none">• Fabricated DFM-S VP 8 valve setting.• Installed two 12-inch valves on DFM-P at head of PH 1982.• Installed air eliminator on Pier 1.• Welded cap on 8-inch in VP 23 on DFM side.• Demolished DFM-P VP 8 for valve installation.• Demolished JP-5 VP 9A.• X-ray on site to shoot VP 24 and 56.• Completed fabrication of pig trap barrels.• Rained entire day and shut down x-ray.



Day	Date	Activity Description
Wednesday	06/05/02	<ul style="list-style-type: none"> • Tie-in and installed DFM-S VP 8 valve setting. • Removed 2-inch valves and installed blinds on DFM PH 1982. • Prepared pit for Valve TFD-144 removal. • Removed blind flange from abandoned side of VP 23 and it was filled with Navy Special fuel oil. Discussed with Carlos Brown and Jim Rice that we would need assistance to remove fuel, as it would contaminate our vac truck and need to be steamed cleaned. Also need a place to dispose of fuel. JA Jones was contacted and vac truck is out of service. They can provide a transport and Oil Response can provide a vac truck if they are given a place to dispose of fuel that is in their vac truck. Mr. Brown and Rice are making arrangements to drain PL. If this is not complete in more than a week it will delay the project clean up. • Frank Cortez with ROICC called to request that we put up silt fence at VP 24. Requested why this had changed from the pre-implementation meeting when it was discussed that we do not need silt fence. He commented that environmental and ROICC feel it is necessary. Informed him that we did not have any along and it will take time to get. X-ray will be on-site Thurs to shoot welds and we can then backfill. Frank agreed that if we backfill by Thurs, silt fence was not necessary.
Thursday	06/06/02	<ul style="list-style-type: none"> • Removed valve TFD-144 and tied in pipe pup. • Fabricated DFM-P VP 8 setting. • Coated and backfilled VP-24. • X-ray on site to shot VP 56 and traps. • Heavy rains continue to fall throughout the week. There is a great deal of mud to contend with and all valve pits and excavations are needed to be drained several times throughout the day.
Friday	06/07/02	<ul style="list-style-type: none"> • Installed DFM-P valve and head of Pier 1. • Fabricated DFM-P VP 8 setting. • X-ray on-site to shoot valve removal and DFM-S VP 8 vales setting. • Traps and valves settings taken to painter sand blasted and primed. • Drained JP-5 pipeline for tie-ins



Day	Date	Activity Description
Saturday	06/08/02	<ul style="list-style-type: none"> • Removed and installed new valve at Tank 83. • Prepped DFM-P VP 8 for tie-in. • Drain JP-5 pipeline. • Installed pressure relief valves on DBB valve on DFM-P and DFM-S new valves. • Continued fabrication of DFM-P VP 8 setting

Note: Weather rainy throughout the entire week and slowed up production. Valve pits had to be drained throughout the day and at the beginning of each day to enable work and x-ray to continue.

Planned Work for Next Week

- Tie-in and install valve setting at DFM-P VP.
- Installation of cap on VP 23.
- Preparation of DFM-P and DFM-S pipelines for refill.
- Removal of 12-inch vertical piping and capping of 4-inch pipelines near head of pier.
- Drain-up of JP-5 pipeline for tie-ins.
- Installation of pig trap at PH 1982.
- Installation of (2) 6-inch valve at Tank 381.
- Coating and backfilling of DFM-P and DFM-S VP 8 and valve removal.

Concerns/Issues/Comments

- Attached is a copy of the percentage progress update by task.
- Bends and valves for traps arrived. (2) 12" valves delivered were reduced port rather than full port. Will call EVSI on Monday to figure out mistake and get correct valves.
- Blind flange at VP 23 contains Naval Special Fuel oil. This needs to be drained by Fuels in order to weld on cap.
- Tanker scheduled to arrive on Thurs. This may require and additional drain-up of DFM pipelines to complete the work.
- Discussion of silt fencing has been brought up by ROICC. Worley's understanding is that if there is not a large amount of dirt piled, silt fence will not be required. VP-24 with greatest amount of backfill has been eliminated.
- Severe rain continued throughout the week. Rain slowed progress as pits and excavations were muddy and continual needed to be drained.
- Mod 2 was approved at the beginning of the week.

Safety Statistics:

- No safety incidents recorded to date.
- Cypress Creek safety meeting held daily at 7:00 am



DATE June 16, 2002

TO Terri Regin

FROM Kirsten Glesne

COPY Lt. Feliz (Fuels), Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC),

PROJECT 065/7074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending June 16, 2002

DOC NO 0707418_G45_0745D

Work Accomplished This Week:

Day	Date	Activity Description
Monday	06/10/02	<ul style="list-style-type: none">• Tied-in DFM-P VP 8 12-inch valve setting.• Installed pressure relief valves on all new DBB valves on DFM systems.• Fabricated pig trap settings.• Continued drain up of JP-5 pipeline.
Tuesday	06/11/02	<ul style="list-style-type: none">• Removed 12-inch vertical piping and capped 4-inch at head of pier, coated and backfilled.• Capped 6-inch at PH 466.• Capped N/S line at VP 23, coated and backfilled.• Installed air eliminators at crossover on pier 1A.• Backfilled DFM-S VP8 and valve removal excavation.• Verified DFM system ready for refill in morning.• X-ray on site to shoot DFM-P VP 8, and traps.• Continued fabrication of traps.• Continued drain up of JP-5 system.• Installed pressure relief valves on DBB valve on DFM and JP-5 system.



Day	Date	Activity Description
Wednesday	06/12/02	<ul style="list-style-type: none">• Cut elbow at PH 1982 for trap installation. Drained up throughout the day. Capped to leave for night.• Tighten bolts for DFM refill.• Directions were not followed by Cypress Creek during tie-in at PH 1982. 2-inch tap was to be installed at low point and tapped to allow for drain up prior to cutting pipe. While Worley was on the pier tightening some nipples, a hose was inserted into vertical pipe and through elbow and determined that product was not there. Cold cut was made and the line was 1/3 of product. Product was contained, but vac truck was filling and cut could not be controlled while truck off loaded. Fuels supplied a truck to off-load vac truck to assure to product would get on the ground. Once drain-up got down to a trickle, the elbow was cut off, a plumbers plug installed and a cap welded on for the evening. Discussions will take place with Cypress Creek to assure that this will not happen again and directions are followed.
Thursday	06/13/02	<ul style="list-style-type: none">• Continued Tie-in of trap at PH 1982.• X-Ray on-site.• Coated DFM-P VP 8.
Friday	06/14/02	<ul style="list-style-type: none">• Installed 6" kicker line and valve in VP 9 for trap.• Continued fabrication on trap.• Coated and backfilled trap connection near road at PH 1982 and VP 56.• X-ray on site.• Continued drain-up at VP 3 of airfield portion.• Installed pressure relief on and around valves at head of piers.
Saturday	06/15/02	<ul style="list-style-type: none">• Completed installation of trap at VP 9.• Installed pressure relief piping on 4-inch valves along pier 1.• Completed backfill at PH 1982 trap.• Excavated for tie-in of tee at PH 1982.• Continued drain up of JP5 airfield portion.

Note: Unless otherwise noted weather was calm and sunny.

Planned Work for Next Week

- Removal of valves and tie-in of piping at JP-5 VP 9A
- Complete tie-in of trap at PH 1982.
- Installation of 6-inch valves at Tank 381.
- Removal of air eliminator near VP 8



- Installation of new drain valve at VP 7A
- Cap of 12-inch blinds on Av-gas line.
- Install support at PH 466 and traps.
- Coat and backfill remaining excavations after x-ray.

Concerns/Issues/Comments

- Attached is a copy of the percentage progress update by task.
- Construction is anticipated to be complete on July 28, 2002.

Safety Statistics:

- No safety incidents recorded to date.
- Cypress Creek safety meeting held daily at 7:00 am



DATE June 23, 2002

TO Terri Regin

FROM Kirsten Glesne

COPY Lt. Feliz (Fuels), Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC),

PROJECT 065/7074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending June 23, 2002

DOC NO 0707418_G45_0770D

Work Accomplished This Week:

Day	Date	Activity Description
Monday	06/17/02	<ul style="list-style-type: none">• Installed two 6-inch valves in Tank 381 Pump House.• Prepped VP 9A for tie-in.• Completed valve pressure relief piping on Pier 1.• Continued drain-up of JP-5 pipeline.• Cleaned up backfill around VP 8, 24, and 25.• Fuel on the tank side of Tank 84. Needed to be drained to remove valve.
Tuesday	06/18/02	<ul style="list-style-type: none">• Removed 6-inch valve from tank 84.• Completed installation of 6-inch valves on tank 381.• Coated and backfilled VP 9 trap.• Complete pressure relief piping on pier valves, VP 56 and PH 1982.• Continued drain-up of JP 5 pipelined.• Began welding and fitting of stripper piping in VP 27.• X-Ray on-site.• JP-5 drain-up has been ongoing for 4 days. Pipeline was previously drained for tie-ins at PH 1982. Fuel is again at this location and still draining.
Wednesday	06/19/02	<ul style="list-style-type: none">• Installed 6-inch tee section of VP 9A.• Continued on stripper piping in VP 27.• Backfilled and cleaned up trap at VP 9.• Cleaned up job site of steel and pipe debris to haul off to DRMO.• Completed drain-up of JP 5 pipeline.



Day	Date	Activity Description
Thursday	06/20/02	<ul style="list-style-type: none">• Tied-in 16-inch tee on PH 1982 Trap.• Welded stripper piping on DFM VP 27.• Installed vent down turns on ¾" valves on above ground settings.• Coated and backfilled PH 1982 trap.• Painted piping in VP 3.• X-ray on-site.• Continued drain up on AV-gas line at VP 6.• Installed supports at PH 466.
Friday	06/21/02	<ul style="list-style-type: none">• Tied-in 12-inch tee at VP 9A.• Drained 12-inch at VP 6.• Bolted on trap at PH 1982.• Installed 2-inch and ¾-inch piping on air vents.• Painted VP 3.
Saturday	06/22/02	<ul style="list-style-type: none">• Completed tie-in of trap at PH 1982.• Continued drain of 12-inch at VP 6.• Fabricated stripper piping.• Primed pier valves and pipe.• Drained JP5 at VP 7A.• Installed supports and concrete on trap at VP 9.• VP 7A is clogged and drain-up cannot be done. There is not low point in the vicinity to allow for a sufficient drain-up to remove 2-inch valve. 2-inch permanent TOR tap will need to be installed outside the pit to complete the drain-up.

Note: Unless otherwise noted weather was calm and sunny.

Planned Work for Next Week

- Weld caps on 12-inch av-gas pipeline at VP 6.
- Install support at PH 1982.
- Install new 2-inch at VP 7A.
- Remove air eliminators at pit near VP 8.
- Complete stripper piping at VP 27.
- Spread gravel at all above ground valves sites.
- Install barricades at all above ground valves settings.
- Coat and backfill VP 9A
- Prime and paint all above ground valve settings and traps.
- Remove all steel debris from construction site.



- Clean-up construction site and prepare tools for shipping.

Concerns/Issues/Comments

- Attached is a copy of the percentage progress update by task.
- Construction is anticipated to be complete on July 28, 2002.
- Job completion walk through is planned for Wed AM. Each site will be visited to assure it is left as required.

Safety Statistics:

- No safety incidents recorded to date.
- Cypress Creek safety meeting held daily at 7:00 am



DATE June 28, 2002

TO Terri Regin

FROM Kirsten Glesne

COPY Lt. Feliz (Fuels), Jim Rice (Fuels), Lt. Bergado (ROICC), Frank Cortez (ROICC),

PROJECT 065/7074-18

SUBJECT Contract N47408-99-D-8014, D.O. 0018,
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Weekly Report for Week Ending June 30, 2002

DOC NO 0707418_G45_0777D

Work Accomplished This Week:

Day	Date	Activity Description
Monday	06/24/02	<ul style="list-style-type: none">• Welded 12-inch caps on VP 6.• Installed 2-inch TOR at VP 7A for drain-up.• Installed supports at PH 1982.• Clean up of valve sites.• Spread gravel at both VP-8's and VP 9.• Primed pier valves.• X-ray on-site.
Tuesday	06/25/02	<ul style="list-style-type: none">• Continued drain-up of VP 7A.• Spread gravel at above ground settings.• Primed pier valves.• Completed supports.• Fabricated 2-inch piping for VP 7A.
Wednesday	06/26/02	<ul style="list-style-type: none">• Continued painting.• Installed 2-inch valve and piping on VP 7A.• Install bollards.• Spread gravel at valve settings.• Installed concrete below valves at head of pier.• Installed 2-inch down comers on Pier 1A air eliminators.• Pressure relief to be piped across the twin seal valves.• Job completion walkthrough complete.



Day	Date	Activity Description
Thursday	06/27/02	<ul style="list-style-type: none">• Installed 2-inch valve and riser on VP 7A.• Continued painting in PH 1982.• Installed pressure relief valves on DBB valve on JP5.• Cleaned up site.• Spread remainder of gravel.
Friday	06/28/02	<ul style="list-style-type: none">• Completed clean up of job site.• Continued to prime and paint valve setting and traps.• Refilled JP-5 PL. Leak on 12-inch valve in Tank 381 that was not worked on by Worley. Replaced gasket and refilled pipeline.

Note: Unless otherwise noted weather was calm and sunny.

Planned Work for Next Week

- Two people to remain on-site to complete painting.

Concerns/Issues/Comments

- Final job walkthrough with Jim Rice, Lt. Feliz, Carlos Brown and Terri Regin completed prior to demobilization. Remaining items include installation of pressure relief tubing on new valve setting and installation of drip pan on Pier 1A.

Safety Statistics:

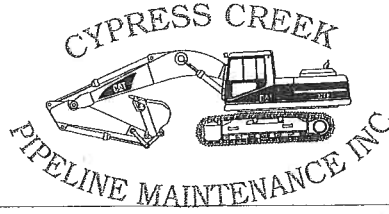
- No safety incidents recorded to date.
- Cypress Creek safety meeting held daily at 7:00 am



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

J-16 Contractor Project Daily Time Sheets

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-16-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <u>WITH BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
D5M Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
<u>DAILY RATE CHARGES FOR CREW + EQUIPMENT</u>									<u>7845.0</u>
Materials & Tools									
Materials & Tools									
Per diem									
Job Description								SUB TOTAL	<u>7845.0</u>
<u>ROOSEVELT ROADS</u>								SALES TAX	
								TOTAL	

Signature K. Glesne

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

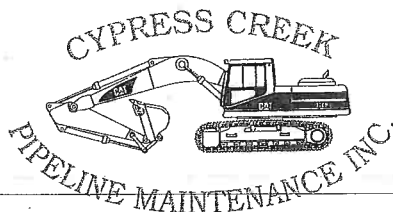
W.O. NO. _____ BILL TO: WORLEY DAY TUE.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-16-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Name									
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
Mobilization Charges									15,000.00
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL	15,000.00
<u>ROOSEVELT ROADS</u>	SALES TAX	
	TOTAL	

Signature [Handwritten Signature]

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 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



20111

DAILY TIME REPORT

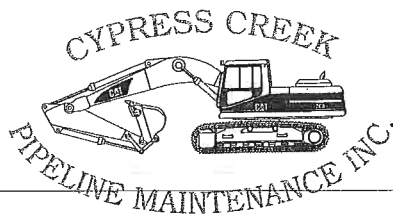
W.O. NO. _____ BILL TO: WORLEY DAY WED.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-17-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>WITH BREAKER</i>	<i>1</i>							<i>EXTRA</i>	
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Name									
eld perintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
<i>DAILY RATE CHARGES FOR CREW & EQUIPMENT</i>									<i>7845.00</i>
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL	<i>7845.00</i>
<i>ROOSEVELT ROADS</i>	SALES TAX	
	TOTAL	

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
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DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.

JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-18-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>WITH BREAKER</i>	<i>1</i>							<i>EXTRA</i>	
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

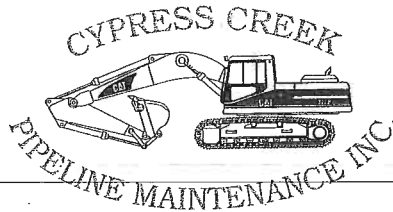
DAILY RATE CHARGES FOR CREW + EQUIPMENT *7845.00*

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>7845.00</i>
	SALES TAX
	TOTAL

Signature *Kirsten Glesne*

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 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
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DAILY TIME REPORT

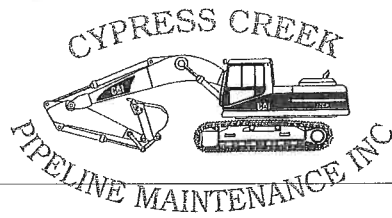
W.O. NO. _____ BILL TO: WORLEY DAY FRI.
 JOB NO. 7074-16 ATTN: KIRSTEN GLESNE DATE 4-19-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>WITH BREAKER</i>	<i>1</i>							<i>EXTRA</i>	
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
eld perintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
<i>DAILY RATE CHARGES FOR CREW + EQUIPMENT</i>									<i>7845.00</i>
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL	7845.00
<i>ROOSEVELT ROADS</i>	SALES TAX	
	TOTAL	

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



26714

DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-20-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <u>WITH BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

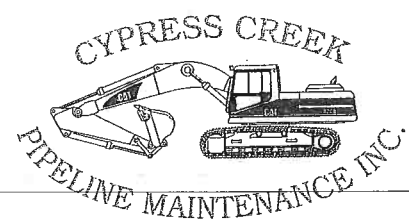
DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>7845.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. 7074-18 BILL TO: WORLEY DAY MON
 JOB NO. ~~7074-18~~ ATTN: KIRSTEN GLESNE DATE 4-22-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>WITH/BREAKER</i>	1							EXTRA	
D5M-Dozer									
580 case Backhoe <i>WITH/BREAKER</i>	1							EXTRA	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW + EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
	7845.00
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

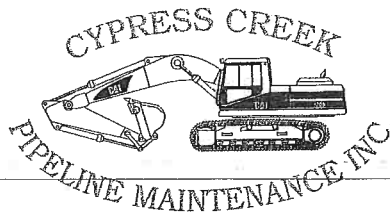
W.O. NO. _____ BILL TO: WORLEY DAY TUE.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-23-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Supervisor									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
<u>DAILY RATE CHARGES FOR CREW + EQUIPMENT</u>									<u>7845.00</u>
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>7845.00</u>
	SALES TAX
	TOTAL

Signature: [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY WED.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-24-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe w/BREAKER	1							EXTRA	
D5M-Dozer									
580 case Backhoe w/BREAKER	1							EXTRA	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

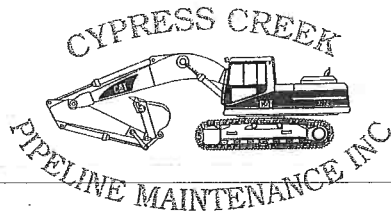
DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
ROOSEVELT ROADS	7845.00
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-25-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

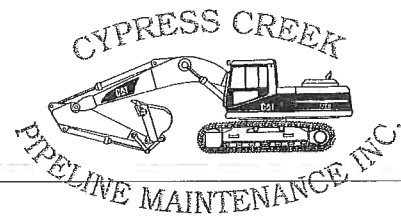
DAILY RATE CHARGES FOR CREW + EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>7845.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-26-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>W/BREAKER</i>	1							EXTRA	
D5M-Dozer									
580 case Backhoe <i>W/BREAKER</i>	1							EXTRA	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

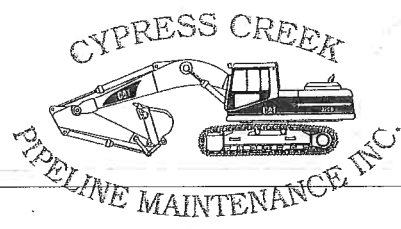
DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>POOSEVELT ROADS</i>	7845.00
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT.
 JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 4-27-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

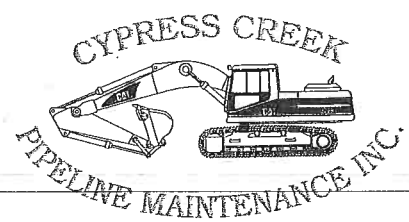
DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>7845.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2121



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY MON.
 JOB NO. 7074-18 ATTN: KIRSTEN SLESNE DATE 4-29-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

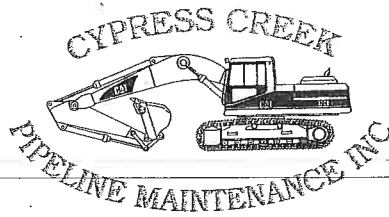
DAILY RATE CHARGES FOR CREW - EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>7845.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE,
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 4-30-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Supervisor									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

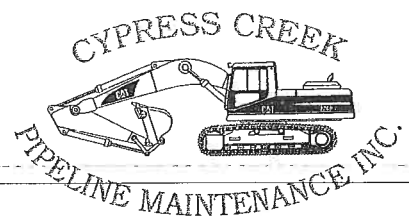
DAILY RATE CHARGES FOR CREW + EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>7845.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY WED.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-1-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe W/BREAKER	1							EXTRA	
D5M-Dozer									
580 case Backhoe W/BREAKER	1							EXTRA	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
ROOSEVELT ROADS	7845.00
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-2-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>w/BREAKER</i>	1							EXTRA	
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	1							EXTRA	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

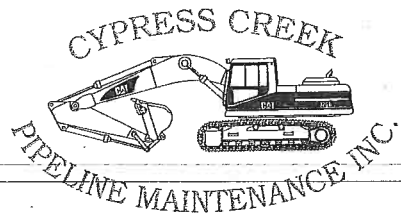
(2) HOURS OVERTIME RATE @ 605.00 PER HR 1210.00
 DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
ROOSEVELT ROADS, 12" PIPE T/E IN @	9055.00
VALUE PIT = 25,	SALES TAX
	TOTAL

Signature *Kirsten Glesne*

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-3-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>w/BREAKER</i>	<i>1</i>							<i>EXTRA</i>	
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	<i>1</i>							<i>EXTRA</i>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

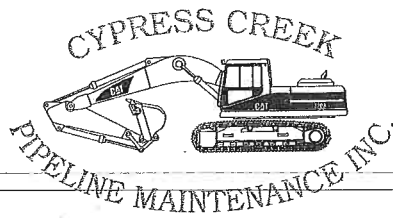
DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>7845.00</i>
	SALES TAX
	TOTAL

Signature *K. Glesne*

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



26730

DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT
 JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 5-4-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
D5M-D ozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

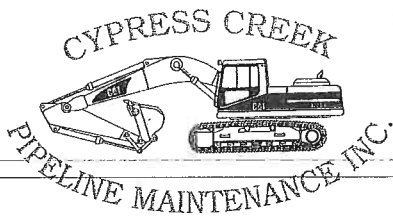
DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>7845.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY MON.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-6-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>w/BREAKER</i>	1							EXTRA	
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	1							EXTRA	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Supervisor									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

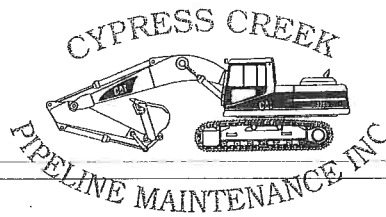
DAILY RATE CHARGES FOR CREW + EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
RESURFECT ROADS	7845.00
	SALES TAX
	TOTAL

Signature [Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-7-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>w/BREAKER</i>	1							EXTRA	
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	1							EXTRA	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

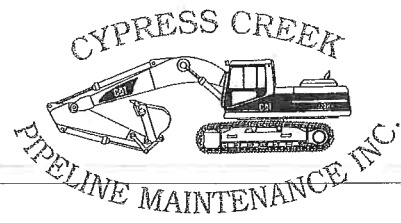
DAILY RATE CHARGES FOR CREW + EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	7845.00
	SALES TAX
	TOTAL

Signature _____

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY WED.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-8-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <i>w/BREAKER</i>	1							EXTRA	
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	1							EXTRA	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

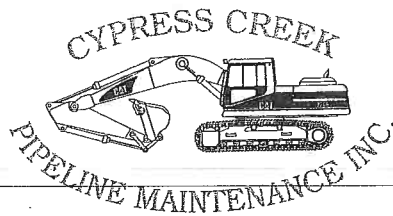
DAILY RATE CHARGES FOR CREW + EQUIPMENT 7245.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL	7245.00
<i>ROOSEVELT ROADS</i>	SALES TAX	
	TOTAL	

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
 JOB NO. 7074-18 ATTN: NIRSTEN GLESNE DATE 5-9-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>GRADALL</u> <u>44 CHAIN</u>	<u>1</u>							<u>EXTRA</u>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Old Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

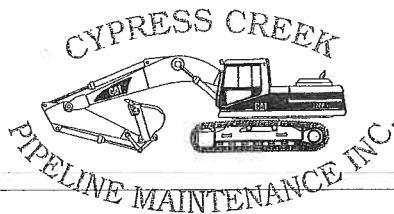
(2) HOURS OVERTIME @ 605.00 PER HR.
DAILY RATE CHARGES FOR CREW + EQUIPMENT
1210.00
7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>9055.00</u>
	SALES TAX
	TOTAL

Signature [Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI.
 JOB NO. 7074-19 ATTN: KIRSTEN GLENE DATE 5-10-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe ^{W/BREAKER}	1								EXTRA
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck ^{GRADALL SUN CABIN}	1								EXTRA
1/2 Ton Truck									
Welding Rig w/ Supplies									

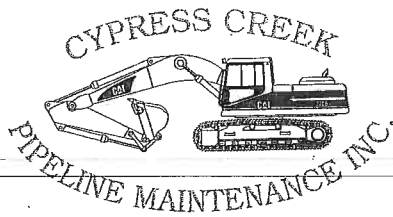
Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
14) HOURS OVERTIME @ 605.00 PER HR.									2420.00
DAILY RATE CHARGES FOR CREW & EQUIPMENT									7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	10265.00
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT.
 JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 5-11-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>W/BREAKER</i>	<i>1</i>							<i>EXTRA</i>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL</i> <i>500 CRAIN</i>	<i>1</i>							<i>EXTRA</i>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

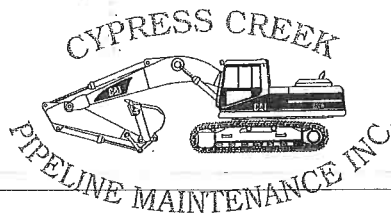
DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>RIDGEVIEW ROAD</i>	<i>7845.00</i>
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY MON.

JOB NO. 7074-18 ATTN: KIRSTEN GLENE DATE 5-13-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/ BREAKER</i>	<i>1</i>							<i>EXTRA</i>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 5411 CRAIN</i>	<i>1</i>							<i>EXTRA</i>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

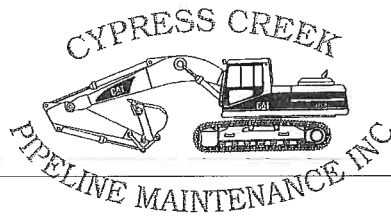
DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>7845.00</i>
	SALES TAX
	TOTAL

Signature *Kirsten Glene*

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE
 JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 5-14-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/BREKNER</i>	<i>1</i>							<i>EXTRA</i>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul-Truck <i>GRADALL 5421</i>	<i>1</i>							<i>EXTRA</i>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Id									
Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

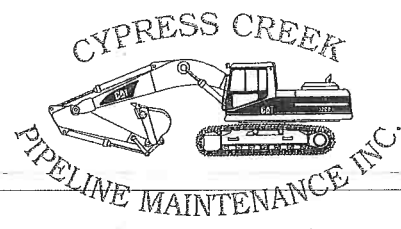
DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>7845.00</i>
	SALES TAX
	TOTAL

[Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY WED.
 JOB NO. 7074-18 ATTN: KIRSTEN GLENE DATE 5-15-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>GRADALL 544 CRAIN</u>	<u>1</u>							<u>EXTRA</u>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>7845.00</u>
	SALES TAX
	TOTAL

Signature [Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-16-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/ BREASER</i>	<i>1</i>							<i>EXTRA</i>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 541 CRAIN</i>	<i>1</i>							<i>EXTRA</i>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Old Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Weider									
Weider's Helper									

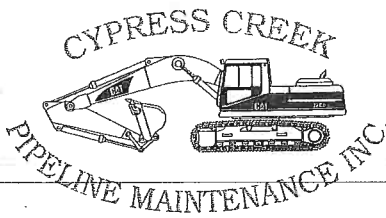
(2) HOURS OVERTIME @ 605.00 PER HR 1210.00
DAILY RATE CHARGES FOR CREW + EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>9055.00</i>
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-17-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 ca se Backhoe <i>w/ BREAKER</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 244</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

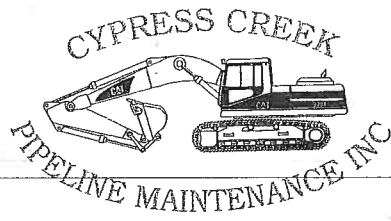
DAILY RATE CHARGES FOR CREW + EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>7845.00</i>
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT.
 JOB NO. 7774-18 ATTN: KIRSTEN GLESNF DATE 5-18-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/ BPE OPER</i>	1								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 544</i>	1								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

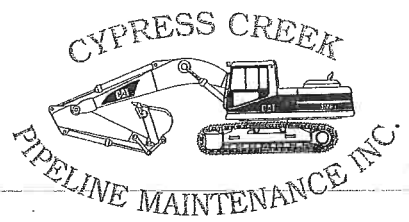
(2) HOURS OVERTIME @ 605.00 PER HR 1210.00
DEVI RATE CHARGE FOR CREW & EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>9055.00</u>
	SALES TAX
	TOTAL

Signature: *[Handwritten Signature]*

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



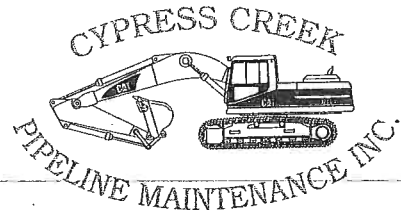
DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE.
JOB NO. 7074-19 ATTN: KIRSTEN CLESNE DATE 5-21-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
	MORTALIZATION CHARGES FOR (1) EMPLOYEE								750.00
Materials & Tools									
Materials & Tools									
Per diem									
Job Description							SUB TOTAL	750.00	
ROOSEVELT ROADS							SALES TAX		
							TOTAL		

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY MON.
JOB NO. 7074-12 ATTN: KIRSTEN GLENE DATE 5-20-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe ^{W/BREAKER}	1							EXTRA	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck ^{GRADALL} _{CRAIN 544}	1							EXTRA	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

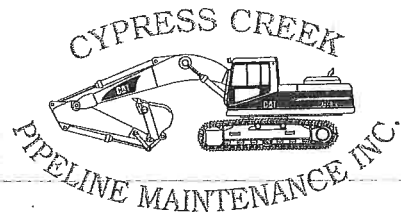
DAILY RATE CHARGES FOR CREW + EQUIPMENT 7845.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	7845.00
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE.
 JOB NO. 7074-18 ATTN: KIRSTEN GLEFNE DATE 5-21-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Half Truck ^{LINK BELT} 3400 TRACK HOE WITH CONCRETE BREAKER									10,000.00
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Job Description	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper	AMERICAN EQUIPMENT CO. (CAGUAS P.R.)								
Materials & Tools									
Materials & Tools	1 MONTH RENTAL PLUS 25%								2500.00
Materials & Tools									
Per diem									
Job Description							SUB TOTAL	12,500.00	
ROOSEVELT ROADS							SALES TAX		
							TOTAL		

Signature [Handwritten Signature]

AMERICAN EQUIPMENT CO., INC.
 P.O. BOX 5358
 CAGUAS, PR 00726
 787-747-9650

Ship To:
 CYPRESS CREEK PIPELINE
 BILL TUEL
 ROOSEVELT ROAD
 CEIBA, PUERTO RICO
 PEARLAND, TX 77588

Branch #: 4500

INVOICE

Customer: 017218
 CYPRESS CREEK PIPELINE
 MAINTENANCE, INC.
 P.O. BOX 3099
 PEARLAND, TX 77588

Invoice #:	062597R
Invoice Date:	05/03/2002
Order Taken By:	CLA
Mrent #:	007396

Ordered By MARY BROWNKOWSK	Customer PO WORLEY INT'L0402	Shipped Via AMECO CARIBBEAN TRUCK
Job Site ROOSEVELT ROADS, CEIBA	Salesperson HOUSE ACCOUNT	Shipped From CAGUAS, PR

Stock #	Model.Serial#	Description	Mfg	Shift	On RentDate	Off RentDate	Current Rental
HDH0045	MES3500HD.544455	HAMMER DEMOLITION H	IND	167	04/16/02		4,500.00
Rental Order#	007396	Each	Current Billing		Each Extende		
Hours out	0	Day 500	Start Date: 04/16/02				
		Week 1500	End Date: 05/15/02				
		Month 4500 1	Days 30				4,500.00

SHIPPED WITH POINT.

PSC0813	3400QEX.A80234	SHOVEL PULL BACKHOE	LKE	167	04/16/02		5,500.00
Rental Order#	007396	Each	Current Billing		Each Extende		
Hours out	2767	Day 611	Start Date: 04/16/02				
		Week 1833	End Date: 05/15/02				
		Month 5500 1	Days 30				5,500.00

SHIPPED WITH KEY, FULL OF DIESEL, FIRE EXT.

DATE REC'D MAY 13 2002 JOB NO. PR
 REPAIRS SUPPLIES
 Equipment Rental
 APP'D FOR PAYMENT
 BILLED TO TKT NO.
 DATE PAID CHECK NO.

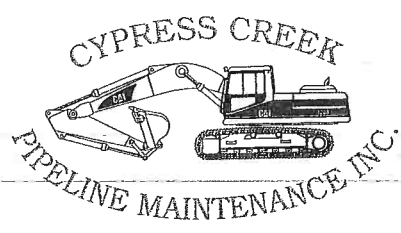
Rates based on 8 hours/day, 40 hours/week, 176 hours/month.

CUSTOMER ORIGINAL

Total Rentals	10,000.00	Freight	0.00	Subtotal	10,000.00
		Additional Charges	0.00	Tax	
		Damage Waiver	0.00	Total	10,000.00

26744

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE.
JOB NO. 7074-18 ATTN: RIRSTEN GLESNE DATE 5-21-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/ BREAKER</i>	<i>1</i>							<i>EXTRA</i>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul-Truck <i>(GRAVEL CRAIN 541)</i>	<i>1</i>							<i>EXTRA</i>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

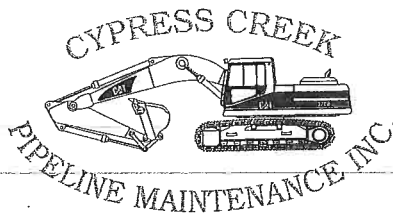
DAILY RATE CHARGES FOR CREW + EQUIPMENT *8679.00*

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>8679.00</i>
	SALES TAX
	TOTAL

Signature *[Signature]*

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY WED.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-22-22

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/ BREAKER</i>	<i>1</i>							<i>EXTRA</i>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL CHAIN 5441</i>	<i>1</i>							<i>EXTRA</i>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Old Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAIY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

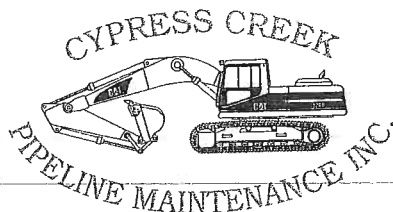
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>RYNISEBELT ROADS</i>	<i>8679.00</i>
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

26746

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
JOB NO. 7074-18 ATTN: KIRSTEN GIESWE DATE 5-23-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/ LBPAKER</i>	<i>1</i>							<i>EXTRA</i>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 544 CRAIN</i>	<i>1</i>							<i>EXTRA</i>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Old Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

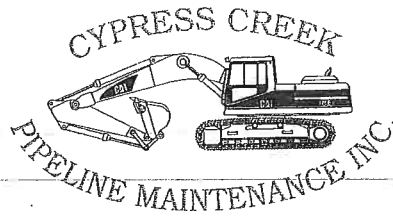
DAILY RATE CHARGES FOR CREW & EQUIPMENT *8679.00*

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>8679.00</i>
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI.
JOB NO. 7074-18 ATTN: RIRSTEN GLESNE DATE 5-24-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <u>w/BREAKER</u>	<u>1</u>							<u>EXTRA</u>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>GRADALL CRAN</u> <u>541</u>	<u>1</u>							<u>EXTRA</u>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Supervisor									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>8679.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT.
JOB NO. 7074-1R ATTN: KIRSTEN GIESNE DATE 5-25-22

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
eld									
uperintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY STAND BY RATE

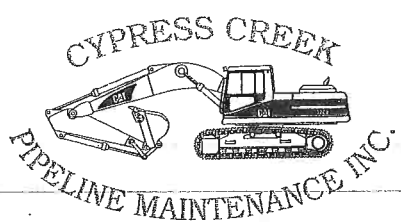
6446.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
ROOSEVELT ROADS	6446.00
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE.
 JOB NO. 7074-18 ATTN: KIRSTEN GLENE DATE 5-28-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/BREAFER</i>	<i>1</i>							<i>EXTRA</i>	
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRANALL 544</i>	<i>1</i>							<i>EXTRA</i>	
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
old perintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

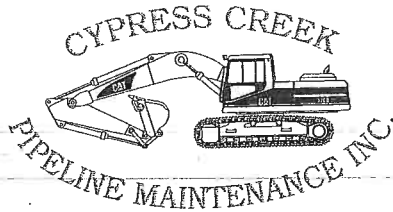
DAILY RATE CHARGES FOR CREW & EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT R.O.A.S</i>	<i>8679.00</i>
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

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Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

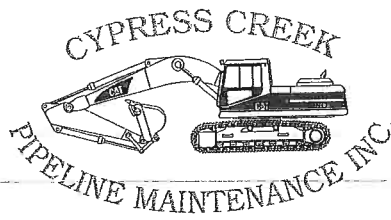
W.O. NO. _____ BILL TO: WORLEY DAY WED.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 5-29-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>W/BREAKER</i>	1								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 5400</i>	1								
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Name									
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
<i>DAILY RATE CUSPERS FOR CREW + EQUIPMENT</i>									8679.00
Materials & Tools									
Materials & Tools									
Per diem									
Job Description								SUB TOTAL	8679.00
<i>ROADS/FLY ROADS</i>								SALES TAX	
								TOTAL	

Signature *[Handwritten Signature]*

28420

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
JOB NO. 7074-18 ATTN: KIRSTEN GIESME DATE 5-30-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u> 1									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>GRADALL 544</u> 1									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

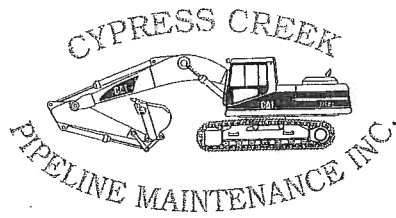
DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>PROSEVELT ROADS</u>	<u>8679.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

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 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLDY DAY FRT
 JOB NO. 7074-12 ATTN: KIRSTEN GLEDIE DATE 5-31-02

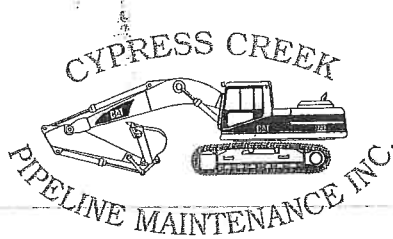
DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe w/BREAKER	1								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck GRADALL 544	1								
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Id	Name								
Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
DAILY RATE CHARGES FOR CREW + EQUIPMENT									8679.00

Materials & Tools									
Materials & Tools									
Per diem									
Job Description							SUB TOTAL	8679.00	
ROOSEVELT RDOS							SALES TAX		
							TOTAL		

Signature _____

28422

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
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Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT.

JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 6-1-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 544</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

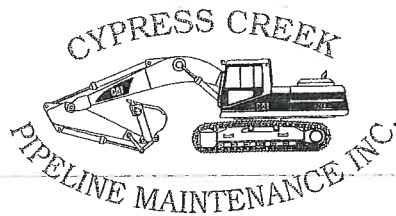
DAILY RATE CHARGES FOR CREW & EQUIPMENT *8679.00*

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>8679.00</i>
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

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 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY MON.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 6-3-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 544</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

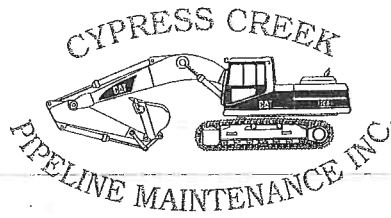
DAILY RATE CHARGES FOR OPER. & EQUIPMENT *2679.00*

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL	<i>2679.00</i>
<i>ROOSEVELT ROLDS</i>	SALES TAX	
	TOTAL	

Signature *[Handwritten Signature]*

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 Location: 5625 W. Orange St.
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DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE.
 JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 6-4-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 544</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Supervisor									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

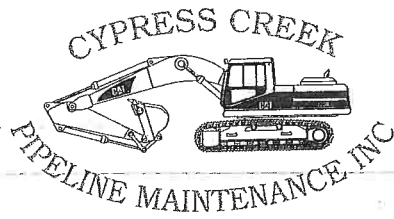
DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>8679.00</i>
	SALES TAX
	TOTAL

Signature *[Handwritten Signature]*

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



28430

DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY WED.
JOB NO. 7074-18 ATTN: RIRSTEN GLESNE DATE 6-5-02

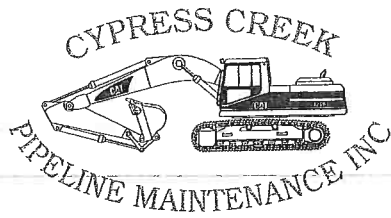
DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>W/BREAKER</i>	1								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul-TRUCK <i>GRADALL 544</i>	1								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
id									
Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
		(1) HOUR OVERTIME @ 685.00 PER HR.							685.00
		DAILY RATE CHARGES FOR CREW & EQUIPMENT							8679.00

Materials & Tools									
Materials & Tools									
Per diem									
	Job Description							SUB TOTAL	9364.00
	ROOSEVELT ROADS							SALES TAX	
								TOTAL	

Signature _____

Mailing: P.O. Box 3099
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 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
 JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 6-6-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>G. RADALL 544</u>	<u>1</u>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

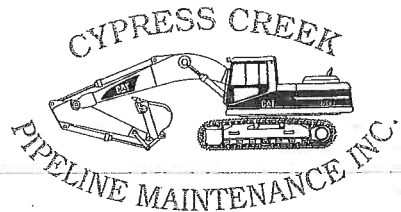
(1) HOUR OVERTIME @ 685.00 PER HR 685.00
DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>9364.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

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Location: 5625 W. Orange St.
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DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 6-7-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
haul Truck <i>GRADALL 544</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW + EQUIPMENT *8679.00*

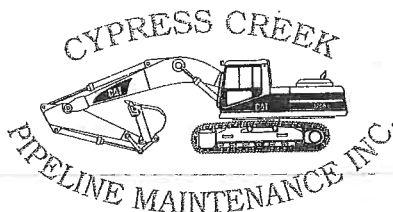
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>8679.00</i>
	SALES TAX
	TOTAL

Signature _____

28434

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT.
JOB NO. 7074-12 ATTN: RIRSTEN GIESNE DATE 6-8-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <u>W/BREAKER</u>	<u>1</u>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>GRADALL 544</u>	<u>1</u>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

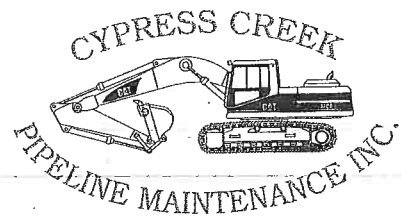
DAILY RATE CHARGES FOR CREW & EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROAD</u>	<u>8679.00</u>
	SALES TAX
	TOTAL

Signature _____

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY MON.
 JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 6-10-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-D ozer									
580 case Backhoe <i>w/BREAKER</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 544</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

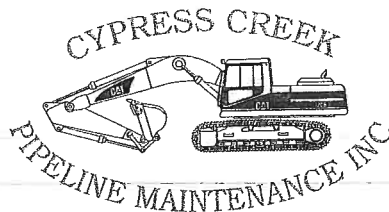
DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description		SUB TOTAL
<i>ROOSEVELT RIGGS</i>		SALES TAX
		TOTAL

Signature _____

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE.
JOB NO. 7074-1R ATTN: KIRSTEN GLESNE DATE 6-11-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <u>w/ BREAKER</u>	<u>1</u>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>GRADALL 544</u>	<u>1</u>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

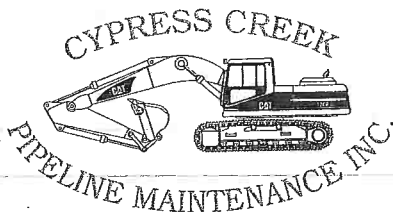
DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	
	SALES TAX
	TOTAL

Signature: _____

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORIFY DAY WED.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 6-12-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Half Truck <i>GRADALL 544</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Supervisor									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

(2) HOURS OVERTIME @ 685.00 PER HR 1370.00
DAILY RATE CHARGES FOR CREW + EQUIPMENT 96.79.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>10049.00</i>
	SALES TAX
	TOTAL

Signature _____

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
 JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 6-13-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>W/BREKED</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 544</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

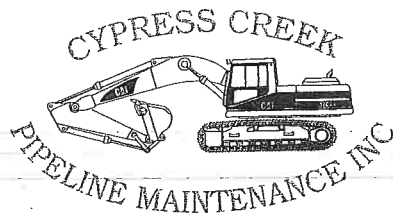
Labor	Name								
Supervisor									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
									<i>(2) HOURS OVERTIME @ 685.00 PER HR.</i>
									<i>DAILY RATE CHARGES FOR CREW + EQUIPMENT</i>

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>10049.00</u>
	SALES TAX
	TOTAL

Signature _____

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 6-14-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>w/BREAKER</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>GRADALL 544</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

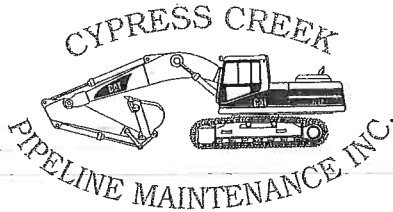
Labor	Name								
Supervisor									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
(1) HOUR OVERTIME @ 685.00 PER HR									685.00
DAILY RATE CHARGES FOR CREW & EQUIPMENT									8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	9364.00
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT.
 JOB NO. 7074-1R ATTN: KIRSTEN GLESNE DATE 6-15-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <i>W/BREAKER</i>	<i>1</i>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <i>SPADALL 544</i>	<i>1</i>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

(1) HOUR OVERTIME @ 6.85.00 PER HR. 685.00
DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<i>ROOSEVELT ROADS</i>	<i>9364.00</i>
	SALES TAX
	TOTAL

Signature _____

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



28441

DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY MON.

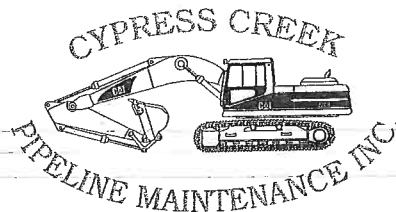
JOB NO. 7074-18 ATTN: KIRSTEN GRESNE DATE 6-17-07

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M Dozer									
580 case Backhoe W/BREWER	1								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Half Truck GRADALL 544	1								
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Name									
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
	(3) HOURS OVERTIME @ 685.00 PER HR.								2055.00
	DAILY RATE CHARGES FOR CRANE + EQUIPMENT								8679.00
Materials & Tools									
Materials & Tools									
Per diem									
Job Description								SUB TOTAL	10734.00
ROOSEVELT ROADS								SALES TAX	
								TOTAL	

Signature [Signature]

28442

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WDRLEY DAY TUE.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 6-18-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <u>w/ BREAKER</u>	<u>1</u>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>GRADALL 544</u>	<u>1</u>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Old Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>8679.00</u>
	SALES TAX
	TOTAL

Signature _____

28443

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY WED.
JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 6-19-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe <u>w/ BREAKER</u>	<u>1</u>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>SPADALL 544</u>	<u>1</u>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Old Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW & EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>8679.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
 JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 6-20-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe w/ BREAKER	1								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck SPADAY 344	1								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Old Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
ROOSEVELT ROADS	8679.00
	SALES TAX
	TOTAL

Signature _____

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI
JOB NO. 7074-18 ATTN: HIRSTEN GLENE DATE 6-21-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-D ozer									
580 case Backhoe <u>w/ BREAKER</u>	<u>1</u>								
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck <u>GRADALL 344</u>	<u>1</u>								
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
old Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

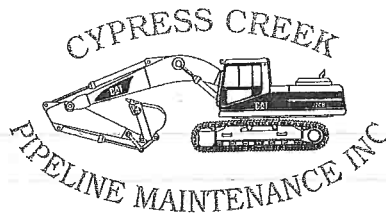
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>8679.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

28446

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



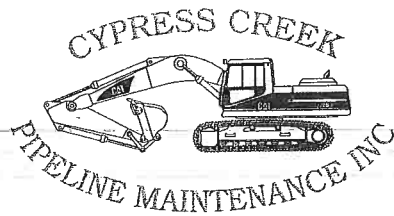
DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY SAT.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 6-22-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
	<i>DAILY RATE CHARGES FOR CREW + EQUIPMENT</i>								<i>8679.00</i>
Materials & Tools									
Materials & Tools									
Per diem									
Job Description							SUB TOTAL	8679.00	
<i>ROOSEVELT ROADS</i>							SALES TAX		
							TOTAL		

Signature _____

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY MON.
JOB NO. 7074-18 ATTN: KIRSTEN GLEISNE DATE 6-24-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW + EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>8679.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY TUE.
 JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 6-25-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Tractorhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

DAILY RATE CHARGES FOR CREW & EQUIPMENT 8679.00

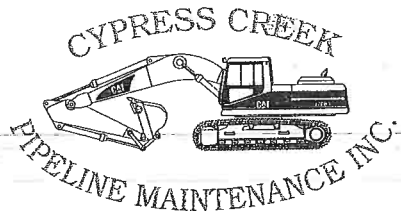
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>8679.00</u>
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

25692

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

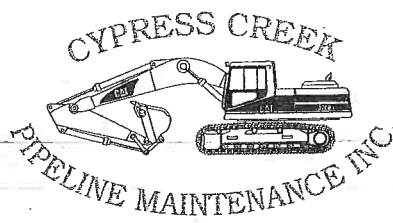
W.O. NO. _____ BILL TO: WORLEY DAY WED.
JOB NO. 7074-18 ATTN: KIRSTEN GLESNE DATE 6-26-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Name									
Old perintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
DAILY RATE CHARGES FOR CREW & EQUIPMENT									8677.00
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL	8677.00
<u>ROOSEVELT ROADS</u>	SALES TAX	
	TOTAL	

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY THUR.
 JOB NO. 7074-18 ATTN: KIRSTEN GLENE DATE 6-27-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 ca.se Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Name									
eld perintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
DAILY RATE CHARGES FOR CREW & EQUIPMENT									8679.00
Materials & Tools									
Materials & Tools									
Per diem									

Job Description <u>RESURFECT ROADS</u>	SUB TOTAL	8679.00
	SALES TAX	
	TOTAL	

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI
 JOB NO. 2074-18 ATTN: KIRSTEN GILSON DATE 6-28-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-D ozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

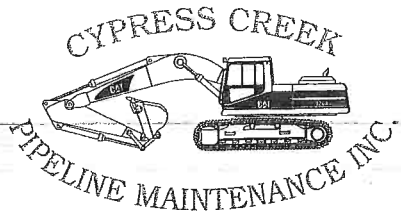
Labor	Name								
Id									
perintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand	(2) 2" FULL PORT BALL VALVES				(P.S.S)				530.43
Gang Hand	(1) 5/8" TUBING BENDER				(REFRICENTRO)				105.00
Operator	(4) METERS GRAVEL				(FERRETERIA SAN.)				120.00
Operator	(30) METERS GRAVEL				(FERR. SAN.)				780.00
Welder	PLASTIC - ANCHOR BOLTS - CONCRETE				(PASCUAL)				152.00
Welder's Helper	WIRE - CEMENT				(PASCUAL)				29.43
	ANCHOR BOLTS - DRILL - PLASTIC				(PASCUAL)				186.81
	LUMBER - CONCRETE				(PASCUAL)				143.62

Materials & Tools									2047.29
Materials & Tools									THIRD PARTY 15% 307.09
Per diem									

Job Description	SUB TOTAL
ROOSEVELT ROADS	2354.38
	SALES TAX
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099
Pearland, TX 77588
Location: 5625 W. Orange St.
Pearland, TX 77581
Phone: 281-412-2400
Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY FRI
JOB NO. 7074-18 ATTN: KIRSTEN GIESNE DATE 6-28-02

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									

Labor	Name								
Field Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									

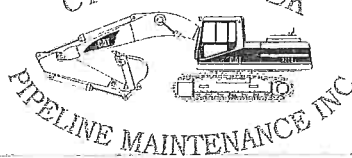
(2) HOURS OVERTIME @ 685.00 PER HR. 1370.00
DAILY RATE CHARGES FOR CREW & EQUIPMENT 8679.00

Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>8679.00</u>
	<u>SALES TAX 10 049.00</u>
	TOTAL

Signature [Handwritten Signature]

Mailing: P.O. Box 3099 Pearland, TX 77588
 5625 W. Orange St. Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



W.O. No.: _____
 Job No.: 7074-18
 Day: TUE.
 Date: 7-2-02

DAILY TIME REPORT

ILL TO: WORLEY

ATTN: KIRSTEN GLENE

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 Case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Equipment Operator's Truck									

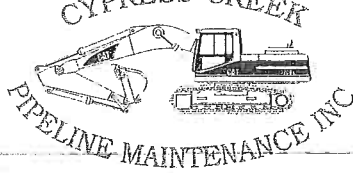
Labor	Name								
Superintendent									
Foreman									
Gang Hand	(2) 12" POLY PIGS								50.75
Gang Hand	(2) 8" POLY PIGS								26.00
Gang Hand	(2) 16" POLY PIGS								96.25
Gang Hand	(1) 8"-12" MULTI SIZE BALL								351.75
Operator	OIL ABSORBENT PADS								25.38
Operator	1-8" POLY GRID								203.05
Welder									
Welder's Helper									
Truck Driver									

Materials & Tools	P.S.S.							11.7	253.00
Materials & Tools	THIRD PARTY 25%							-1.7	112.73
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>262.76</u>
	SALES TAX
	TOTAL <u>267.01</u>

Accepted: _____ Submitted: _____

Mailing: P.O. Box 3099 Pearland, TX 77588
 5625 W. Orange St. Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



W.O. No.: _____
 Job No.: 7074-18
 Day: TUE.
 Date: 7-2-02

DAILY TIME REPORT

ALL TO: WARRLEY

ATTN: KIRSTEN GLEENE

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 Case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Equipment Operator's Truck									

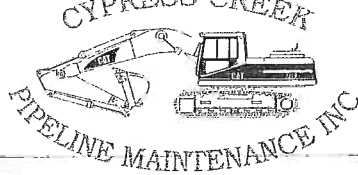
Labor	Name								
Superintendent									
Foreman									
Gang Hand									
Gang Hand	(1) 544 D GRADALL	(1) MONTH RENTAL	(RIMCO)						4320.00
Gang Hand	(1) RUBBER TIRE WITH BREAKER	RENTAL	(CGS)						3250.00
Gang Hand									
Operator	544 DELIVERY								540.00
Operator	LINK BELT 3400 DELIVERY								250.00
Welder									
Welder's Helper									
Truck Driver									

Materials & Tools									(1) 5360.00
Materials & Tools									THIRD PARTY 25% 2170 = 542.50
Per diem									

Job Description	SUB TOTAL
ROOSEVELT ROADS	10450.00
	SALES TAX
	TOTAL 10757.50

Prepared by: [Signature] Submitted: _____

Mailing: P.O. Box 3099 Pearland, TX 77588
 5625 W. Orange St. Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



W.O. No.: _____
 Job No.: 7074-18
 Day: TUE.
 Date: 7-2-02

DAILY TIME REPORT

ILL TO: WOLFEY

ATTN: KIRSTEN GLENE

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 Case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Equipment Operator's Truck									

Labor	Name								
Superintendent									
Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
Truck Driver	(1) RUBBER TIRE HOE WITH CONCRETE BREAKER								3350.00
	ONE MONTH RENTAL (CG'S EQUIPMENT)								
	DELIVERY CHARGE								150.00
Materials & Tools									3500.00
Materials & Tools								THIRD PARTY 25 %	875.00
Per diem									

Job Description	SUB TOTAL
ROADWELT ROADS	4375.00
	SALES TAX
	TOTAL

Accepted [Signature]

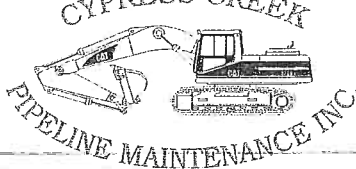
Submitted _____

Mailing: P.O. Box 3099 Pearland, TX 77588

5625 W. Orange St. Pearland, TX 77581

Phone: 281-412-2400

Fax: 281-412-2727



W.O. No.: _____

Job No.: 7074-19

Day: TUE.

Date: 7-2-02

DAILY TIME REPORT

ILL TO: WORLEY

ATTN: KIRSTEN GLESNE

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 Case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Equipment Operator's Truck									

Labor	Name								
Superintendent									
Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
Truck Driver									

DEMOLITIONAL CHARGES FOR CREW & EQUIPMENT 15,000.00

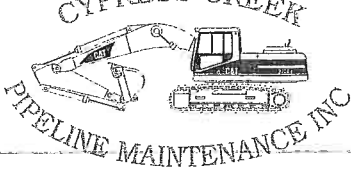
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>15,000.00</u>
	TOTAL

Accepted [Signature]

Submitted _____

Mailing: P.O. Box 3099 Pearland, TX 77588
 5625 W. Orange St. Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



W.O. No.: _____
 Job No.: 7074-18
 Day: TUE.
 Date: 7-2-02

DAILY TIME REPORT

TO: WORLEY

ATTN: KIRSTEN GIESNE

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 Case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Equipment Operator's Truck									

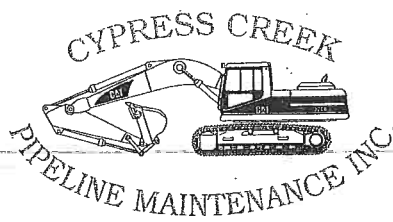
Labor	Name								
Superintendent									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator									
Operator									
Welder									
Welder's Helper									
Truck Driver									
DEMORALIZATION CHARGES FOR (1) EMPLOYEE									750.00
Materials & Tools									
Materials & Tools									
Per diem									

Job Description	SUB TOTAL
<u>ROOSEVELT ROADS</u>	<u>750.00</u>
	SALES TAX
	TOTAL

Accepted [Signature]

Submitted _____

Mailing: P.O. Box 3099
 Pearland, TX 77588
 Location: 5625 W. Orange St.
 Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



DAILY TIME REPORT

W.O. NO. _____ BILL TO: WORLEY DAY WED.
 JOB NO. 70741-1R ATTN: KIRSTEN GLESNE DATE 7-10-02

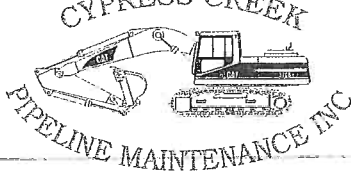
DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M-Dozer									
580 case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Labor									
Job	Name								
Job Superintendent									
Gang Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand									
Operator	LIGHT TOWER RENTAL				(CGS)				650.00
Operator	ROTARY HAMMER RENTAL				(CGS)				120.00
Welder									
Welder's Helper									
									770.00

Materials & Tools									
Materials & Tools					15 th THIRD PARTY				115.50
Per diem									

Job Description	SUB TOTAL	985.50
Roosevelt Roads	SALES TAX	
ROTARY HAMMER USED FOR PIPE SUPPORT BARRIERS	TOTAL	
BURTS...		

Signature [Signature]

Mailing: P.O. Box 3099 Pearland, TX 77588
 5625 W. Orange St. Pearland, TX 77581
 Phone: 281-412-2400
 Fax: 281-412-2727



W.O. No.: _____
 Job No.: 7074-12
 Day: MON
 Date: 7-15-02

DAILY TIME REPORT

TO: WOPLEY

ATTN: KIRSTEN RIESE

DESCRIPTION	NO. OF	TIME START	MEAL BREAK	TIME STOP	REG. HOURS	OVERTIME HOURS	PER DAY	PER HOUR	AMOUNT
Equipment									
320 Trackhoe									
D5M- Dozer									
580 Case Backhoe									
1 Ton Truck									
Gang Truck w/ Tools									
Maintenance Truck w/ Tools									
Haul Truck									
1/2 Ton Truck									
Welding Rig w/ Supplies									
Equipment Operator's Truck									

Labor	Name								
Superintendent									
Foreman									
Gang Hand									
Gang Hand									
Gang Hand									
Gang Hand	BRADLEY S440	(RIMCO)							4320.00
Operator									
Operator									
Welder									
Welder's Helper									
Truck Driver									

Materials & Tools									
Materials & Tools						THIRD PARTY DISK			1080.00
Per diem									

Job Description	SUB TOTAL
RIG BELT ROAD	5400.00
	SALES TAX
	TOTAL

Accepted _____ Submitted _____



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DAILY TIME & DISTRIBUTION RECORD

RX- 08809

To: World 4 Int'l Date: 4/29/02

Job No.: _____
Crew: J. Ruiz / J. Hernandez / K. Krause

Att.: Mrs. Kristen Glaust Location: Cuba

P.O. No.: _____ Test Performed: X-Rays

Travel:	To Job	<u>2</u>	S.T. Hours	From Job	<u>2</u>	S.T. Hours
			O.T. Hours			O.T. Hours

Work Time:	From	<u>10:00</u>	<u>(a.m.)</u> - p.m.	To	<u>12:00</u>	a.m. - <u>(p.m.)</u>
	From	<u>1:00</u>	a.m. - <u>(p.m.)</u>	To	<u>8:00</u>	a.m. - <u>(p.m.)</u>
	From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
	From	_____	a.m. - p.m.	To	_____	a.m. - p.m.

Stand by or Delay Time:	From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
	From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
	From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
	From	_____	a.m. - p.m.	To	_____	a.m. - p.m.

Material used: X-Ray film

Film Size: <u>4 1/2 x 10</u>	Type	<u>AGKV</u>	<u>D²</u>	No. Used	<u>36</u>
<u>4 1/2 x 17</u>	Type	"	"	No. Used	<u>48</u>
	Type	_____	_____	No. Used	_____

Test or Damaged Film:

REMARKS: Perform X-rays to 28 welds various sizes as per request. Will take (6) cold welds for developing at N&C shop (2hr) work time

A & C Iron Works _____ Client Approved [Signature]
Signature _____ Signature _____



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DAILY TIME & DISTRIBUTION RECORD

RX- 08814

To: Worley Tu-16 Date: 5/08/02

Job No.: _____
Crew: J. Ruiz / F. Cruz / J. Hernandez

Att.: Mrs: Kirsten Glesne Location: Navy Base Ceiba

P.O. No.: _____ Test Performed: X-Rays

Travel: To Job 2 S.T. Hours _____ From Job _____ S.T. Hours _____
O.T. Hours _____ O.T. Hours 2

Work Time: From 8:10 a.m. - p.m. To 12:10 a.m. - p.m.

From 12:30 a.m. - p.m. To 7:00 a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

Stand by or Delay Time: From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

Material used: _____

Film Size: 4 1/2 x 17 Type ALOKA D7 No. Used 60

Type " No. Used 3

Type _____ No. Used _____

Test or Damaged Film: Type _____ No. Used _____

REMARKS: Perform X-rays to prep NAB Pipe line
welds As per Customer Request. 6" & 8" 12"

A & C Iron Works [Signature]
Signature

Client Approved [Signature]
Signature



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DAILY TIME & DISTRIBUTION RECORD

RX- 08820

To: Worley Intl. Date: 5/16/02

Job No.: _____
Crew: J. Ruiz / J. Hernandez / R. Korman

Att.: Sup. K. Glensue Location: Ceiba Navy Base

P.O. No.: _____ Test Performed: X-Ray

Travel:	To Job	<u>2</u>	S.T. Hours	From Job		S.T. Hours
			O.T. Hours		<u>2</u>	O.T. Hours

Work Time: From 9:00 a.m. - p.m. To 1:00 a.m. - p.m.

From 1:30 a.m. - p.m. To 7:30 a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

Stand by or Delay Time: From 6:00 a.m. - p.m. To 7:00 a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

Material used: X-Ray

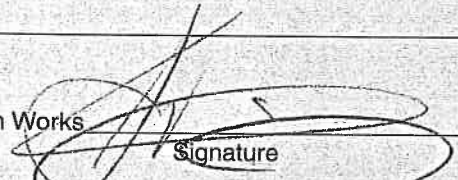
Film Size: 4 1/2 x 17 Type AGRD No. Used 49

Type _____ No. Used _____

Type _____ No. Used _____

Test or Damaged Film: Type _____ No. Used _____

REMARKS: Per 162 (1) 12"φ (5) 8"φ
(1) 8"φ Repair As per request

A & C Iron Works

Signature

Client Approved J. E. Weather Jr.
Signature



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DAILY TIME & DISTRIBUTION RECORD

RX- 08823

To: Worley-Intl. Date: 5/28/02
 Job No.: _____
 Crew: J. Ruiz / F. Hernandez / J. Hernandez
 Att.: Prop. Man. Kersten Glensur Location: Ceiba Army Base
 P.O. No.: Deposit Test Performed: X-RAYS

Travel: To Job 1 1/2 S.T. Hours _____ From Job _____ S.T. Hours _____
 O.T. Hours _____ O.T. Hours _____

Work Time: From 10:00 a.m. - p.m. To 3:00 a.m. - p.m.
 From 3:30 a.m. - p.m. To 6:30 a.m. - p.m.
 From _____ a.m. - p.m. To _____ a.m. - p.m.
 From _____ a.m. - p.m. To _____ a.m. - p.m.
 Stand by or Delay Time: From _____ a.m. - p.m. To _____ a.m. - p.m.
 From _____ a.m. - p.m. To _____ a.m. - p.m.
 From _____ a.m. - p.m. To _____ a.m. - p.m.
 From _____ a.m. - p.m. To _____ a.m. - p.m.

Material used: X-RAY FILM
 Film Size: 4 1/2 X 17 Type AGFA D7 No. Used _____
 Type _____ No. Used _____
 Type _____ No. Used _____

Test or Damaged Film: Type _____ No. Used _____

REMARKS: Perform X-Rays to Pro. Kab. Pipeline
XN-66- + h/w. 1/18 3

A & C Iron Works _____ Signature _____ Client Approved F. Weather Signature _____



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DAILY TIME & DISTRIBUTION RECORD

RX- 08830

To: Worley Intl.

Date: 06/04/02

Job No.:

Crew: J. Ruiz / F. Krane / H. Delgado

Att.: Sup: Kersten Glensne

Location: Ceiba Navy Base

P.O. No.: COD

Test Performed: X-Rays / P.T.

Travel:	To Job	<u>1 1/2</u>	S.T. Hours	From Job		S.T. Hours
			O.T. Hours		<u>1 1/2</u>	O.T. Hours

Work Time:	From	<u>9:30</u>	a.m. - p.m.	To	<u>12:00</u>	a.m. (p.m.)
	From	<u>12:30</u>	a.m. (p.m.)	To	<u>7:30</u>	a.m. (p.m.)
	From		a.m. - p.m.	To		a.m. - p.m.
	From		a.m. - p.m.	To		a.m. - p.m.
Stand by or Delay Time:	From	<u>7:00</u>	(a.m.) - p.m.	To	<u>8:00</u>	(a.m.) - p.m.
	From		a.m. - p.m.	To		a.m. - p.m.
	From		a.m. - p.m.	To		a.m. - p.m.
	From		a.m. - p.m.	To		a.m. - p.m.

Prep Equip for mobilization

Material used:				
Film Size: <u>4 1/2 X 10</u>	Type	<u>ABP2</u>	<u>D7</u>	No. Used <u>9</u>
<u>4 1/2 X 17</u>	Type	<u>"</u>	<u>"</u>	No. Used <u>27</u>
	Type			No. Used

Test or Damaged Film: Type No. Used

REMARKS: Per form x-rays to 12 welds various locations. Lost time at Main Gate with permit 1 1/2 hr. Lost time due to rain and/or weather conditions.

A & C Iron Works	<u>[Signature]</u>	Client Approved	<u>[Signature]</u>
	Signature		Signature



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DAILY TIME & DISTRIBUTION RECORD

RX- 08833

To: Worley Intl. Date: 6/07/02

Job No.: _____

Crew: J. Ruiz / F. Kranz / H. Delgado

Att.: Sup. Kirsten Glensne Location: Ceiba Navy Base

P.O. No.: _____ Test Performed: X-RAYS

Travel:	To Job	S.T. Hours	From Job	S.T. Hours
		<u>1 1/2</u>		<u>1 1/2</u>
		O.T. Hours		O.T. Hours

Work Time:	From	<u>2:00</u>	a.m. (p.m.)	To	<u>9:30</u>	a.m. (p.m.)
------------------	------	-------------	-------------	----	-------------	-------------

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

Stand by or Delay Time:

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

From _____ a.m. - p.m. To _____ a.m. - p.m.

Material used: XIRAY film

Film Size: Type _____ No. Used _____

Type _____ No. Used _____

Type _____ No. Used _____

Test or Damaged Film: Type _____ No. Used _____

REMARKS: Perform x-rays to (4) 12" welds
As per request

A & C Iron Works [Signature]
Signature

Client Approved [Signature]
Signature



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DAILY TIME & DISTRIBUTION RECORD

RX- 08834

To: Worley Intl. Date: 6/11/02

Job No.: _____

Crew: J. Ruiz / F. Krantz / H. Polanco

Att.: Sup. Kirsten Glesne Location: Geiba Navy Base

P.O. No.: _____ Test Performed: X-RAYS

Travel:	To Job: <u>1 1/2</u>	S.T. Hours	From Job	S.T. Hours
		O.T. Hours	<u>1 1/2</u>	O.T. Hours

Work Time: From 9:30 a.m. - p.m. To 2:30 a.m. (p.m)

From 3:00 a.m. - (p.m.) To 7:30 a.m. (p.m)

From _____ a.m. - p.m. To _____ a.m - p.m.

From _____ a.m. - p.m. To _____ a.m - p.m.

Stand by or Delay Time: From 7:00 a.m. - p.m. To 8:00 (a.m - p.m)

From _____ a.m. - p.m. To _____ a.m - p.m.

From _____ a.m. - p.m. To _____ a.m - p.m.

From _____ a.m. - p.m. To _____ a.m - p.m.

Material used: X-Ray film

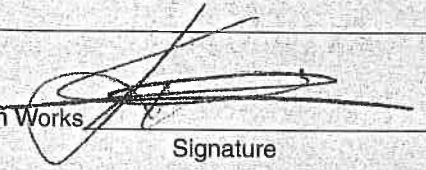
Film Size: 4 1/2 X 17 Type AGFID. No. Used 52

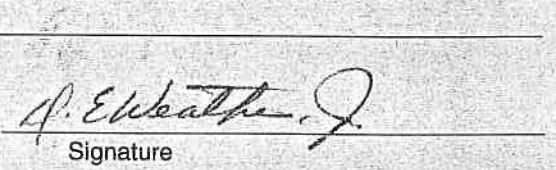
Type _____ No. Used _____

Type _____ No. Used _____

Test or Damaged Film: Type _____ No. Used _____

REMARKS: Perform X-rays to (16) 12" Ø welds and (2) 16" Ø welds as per request

A & C Iron Works  Signature

Client Approved  Signature



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DAILY TIME & DISTRIBUTION RECORD

RX- 08835

To: Worldly Intl. Date: 6/13/02

Job No.: _____

Crew: J. Ruiz / R. Kraus / H. Delgado

Att.: Sup. Kirsten Location: Geiba Base Navy

P.O. No.: _____ Test Performed: X-ray / P.T.

Travel:	To Job	<u>1 1/2</u>	S.T. Hours	From Job	_____	S.T. Hours
			O.T. Hours		<u>1 1/2</u>	O.T. Hours

Work Time:	From	<u>10:00</u>	a.m. - p.m.	To	<u>4:00</u>	a.m. - p.m.
------------------	------	--------------	-------------	----	-------------	-------------

From	<u>4:30</u>	a.m. - p.m.	To	<u>6:30</u>	a.m. - p.m.
------	-------------	-------------	----	-------------	-------------

From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
------	-------	-------------	----	-------	-------------

From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
------	-------	-------------	----	-------	-------------

Stand by or Delay Time:	From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
-------------------------------	------	-------	-------------	----	-------	-------------

From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
------	-------	-------------	----	-------	-------------

From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
------	-------	-------------	----	-------	-------------

From	_____	a.m. - p.m.	To	_____	a.m. - p.m.
------	-------	-------------	----	-------	-------------

Material used: X-ray Film

Film Size:	Type	<u>AGFA</u>	<u>D7</u>	No. Used	<u>23</u>
------------------	------	-------------	-----------	----------	-----------

Type	<u>11</u>	<u>9</u>	No. Used	<u>9</u>
------	-----------	----------	----------	----------

Type	_____	No. Used	_____
------	-------	----------	-------

Test or Damaged Film:	Type	_____	No. Used	_____
-----------------------------	------	-------	----------	-------

REMARKS: For Kern x-ray to (5) 12"φ (2) 16"φ
(3) 8"φ P.T. Various 2"φ 1"φ Nozzles

A & C Iron Works [Signature] Client Approved H. Elbeath Jr.
 Signature Signature



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DAILY TIME & DISTRIBUTION RECORD

RX- 08842

To: Worley Int'l. Date: 6/20/02
 Job No.: 02
 Crew: J. Ruiz / H. Delgado / F. Kranz
 Att.: Sup. Kristen Glensne Location: Navy Base Ceiba
 P.O. No.: _____ Test Performed: X-Rays

Travel: To Job 1 1/2 S.T. Hours From Job S.T. Hours
 O.T. Hours 1 1/2 O.T. Hours

Work Time: From 9:30 (a.m.) - p.m. To 3:30 a.m. - (p.m.)
 From 4:00 a.m. (p.m.) To a.m. - p.m.
 From a.m. - p.m. To a.m. - p.m.
 From a.m. - p.m. To a.m. - p.m.
 Stand by or Delay Time: From 7:00 (a.m.) - p.m. To 8:00 (a.m.) - p.m.
 From a.m. - p.m. To a.m. - p.m.
 From a.m. - p.m. To a.m. - p.m.
 From a.m. - p.m. To a.m. - p.m.

Material used: X-ray film
 Film Size: 4 1/2 x 17 Type AGFA DS No. Used 35
4 1/2 x 10 Type " D7 No. Used 21
 Type _____ No. Used _____

Test or Damaged Film: Type _____ No. Used _____
 REMARKS: Perform X-rays to Tie in Welds As per Customer request in various locations
(7) 4" (7) 5" (1) 10" (5) 16"

A & C Iron Works _____ Client Approved K. Glensne
 Signature _____ Signature _____



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DAILY TIME & DISTRIBUTION RECORD

RX- 08844

To: Worley Intl. Date: 6/24/02
 Job No.: 02-
 Crew: J. Ruiz / F. Krauz / M. Delgado
 Att.: Sup. Kriston Glesne Location: Ceiba Navy Base
 P.O. No.: COD Test Performed: X-RAYS

Travel: To Job 1 1/2 S.T. Hours From Job S.T. Hours
 O.T. Hours 1 1/2 O.T. Hours

Work Time: From 1:30 a.m. - p.m. To 7:00 a.m. p.m.

From a.m. - p.m. To a.m. - p.m.

From a.m. - p.m. To a.m. - p.m.

From a.m. - p.m. To a.m. - p.m.

Stand by or Delay Time: From a.m. - p.m. To a.m. - p.m.

From a.m. - p.m. To a.m. - p.m.

From a.m. - p.m. To a.m. - p.m.

From a.m. - p.m. To a.m. - p.m.

Material used: _____

Film Size: Type _____ No. Used _____

Type _____ No. Used _____

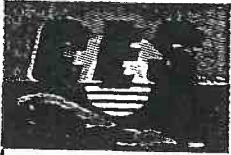
Type _____ No. Used _____

Test or Damaged Film: Type _____ No. Used _____

REMARKS: Per Request x-rays to (4) 6'Ø (6) 12'Ø
11/8"Ø A-1 Various location.

A & C Iron Works _____ Client Approved _____
 Signature _____ Signature _____

OK



CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT

SHORT FORM

Page 1 of 1

CUSTOMER: Rivera Engineering

DATE: April 29/02

CESI JOB NUMBER _____

LOCATION: Roosevelt Road s Ciba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:00^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:00</u>	<u>8 HRS</u>	<u>1 HR</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>VAC. TRUCK</u>		<u>1</u>	<u>7:00^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:00</u>	

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

I certify that this report is a true and complete record of the labor, equipment, services and materials, provided by the contractor on the date listed above for the project number cited above.

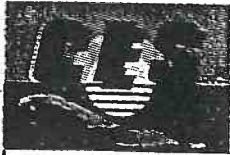
[Signature]
Contractor's Authorized Representative

CUSTOMER AUTHORIZED REPRESENTATIVE REVIEW

I certify that inspection and acceptance of the listed items has been made by me or under my supervision, except as noted herein or in supporting documents.

[Signature]
Customer Authorized Representative

8:00
5:15



CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT

SHORT FORM
Page 1 of 1

CUSTOMER: Rivera Engineering

DATE: MAY 2 2002

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads Ceiba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:00^{AM}</u>	<u>5:30^{PM}</u>			<u>8 HRS</u>	<u>2.5 HRS</u>
<u>Conduct by PERAL</u>	<u>No. JUDGE</u>	<u>8:00</u>	<u>5:15</u>			<u>8 HRS</u>	<u>1.15 HRS</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>Spec. Truck</u>		<u>1</u>	<u>7:00^{AM}</u>	<u>5:30^{PM}</u>			

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

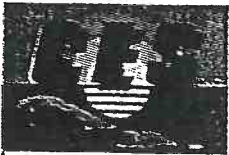
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[Signature]
Contractor's Authorized Representative

CUSTOMER AUTHORIZED REPRESENTATIVE REVIEW

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[Signature]
Customer Authorized Representative



CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT

SHORT FORM

Page 1 of 1

CUSTOMER: Riviera Engineering

DATE: May 9/02

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads Ceiba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:00^{PM}</u>	<u>8</u>	<u>.30</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>1/2 TRUCK</u>		<u>1</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:00^{PM}</u>	

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

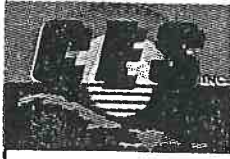
I certify that this report is a true and complete record of the labor, equipment, services and materials, provided by the contractor on the date listed above for the project number cited above.

[Signature]
Contractor's Authorized Representative

CUSTOMER AUTHORIZED REPRESENTATIVE REVIEW

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[Signature]
Customer Authorized representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM
Page 1 of 1

CUSTOMER: Rivera Engineering

DATE: May 10/02

CESI JOB NUMBER _____

LOCATION: Roosevelt Road cc/ha

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>7:30^{PM}</u>	<u>8</u>	<u>3.0</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>WAC. Truck</u>		<u>1</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>7:30^{PM}</u>	

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

I certify that this report is a true and complete record of the labor, equipment, services and materials, provided by the contractor on the date listed above for the project number cited above.

Edmund Schmidt
Contractor's Authorized Representative

CUSTOMER/AUTHORIZED REPRESENTATIVE REVIEW

I certify that inspection and acceptance of the listed items has been made by me or under my supervision, except as noted herein or in supporting documents.

K. J. [Signature]
Customer Authorized Representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM

Page 1 of 1

CUSTOMER: Rupper Engineering

DATE: May 13 / 02

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads Ceiba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>7:30^{PM}</u>	<u>8</u>	<u>3.0</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>VAC. Truck</u>		<u>1</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>7:30^{PM}</u>	

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

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[Signature]
Contractor's Authorized Representative

CUSTOMER/AUTHORIZED REPRESENTATIVE REVIEW

I certify that inspection and acceptance of the listed items has been made by me or under my supervision, except as noted herein or in supporting documents.

[Signature]
Customer Authorized representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM

Page 1 of 1

CUSTOMER: Rivera Engineering

DATE: May 14/02

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads, PR

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{AM}</u>	<u>6:00^{PM}</u>			<u>8</u>	<u>2.30</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>1/2 AC TRUCK</u>		<u>1</u>	<u>7:30^{AM}</u>	<u>6:00^{PM}</u>			

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

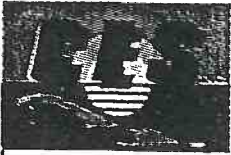
I certify that this report is a true and complete record of the labor, equipment, services and materials, provided by the contractor on the date listed above for the project number cited above.

[Signature]
Contractor's Authorized Representative

CUSTOMER/AUTHORIZED REPRESENTATIVE REVIEW

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[Signature]
Customer Authorized representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM

Page 1 of 1

CUSTOMER: Riviera Engineering

DATE: MAY 15/07

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads Ceiba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:00^{PM}</u>	<u>8</u>	<u>.30</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>Wre. Truck</u>		<u>1</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:00^{PM}</u>	

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

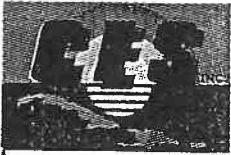
I certify that this report is a true and complete record of the labor, equipment, services and materials, provided by the contractor on the date listed above for the project number cited above.

[Signature]
Contractor's Authorized Representative

CUSTOMER/AUTHORIZED REPRESENTATIVE REVIEW

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[Signature]
Customer Authorized representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM

Page 1 of 1

CUSTOMER: Riviera Engineering

DATE: Mayo 16/02

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads Ceiba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:30</u>	<u>8</u>	<u>1.0</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>1/pc. Truss</u>		<u>1</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:30</u>	

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

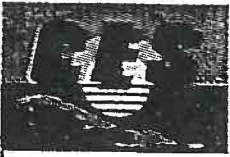
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Edwin Schmidt
Contractor's Authorized Representative

CUSTOMER/AUTHORIZED REPRESENTATIVE REVIEW

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K. H. Smith
Customer Authorized representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM

Page 1 of 1

CUSTOMER: Rivera Engineering

DATE: May 18/02

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads PR

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{am}</u>	<u>12:00</u>	<u>1:00</u>	<u>9:00^{pm}</u>	<u>8</u>	<u>4.30</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>1/AC Truck</u>		<u>1</u>	<u>7:30^{am}</u>	<u>12:00</u>	<u>1:00</u>	<u>9:00^{pm}</u>	

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

I certify that this report is a true and complete record of the labor, equipment, services and materials provided by the contractor on the date listed above for the project number cited above.

[Signature]
Contractor's Authorized Representative

CUSTOMER AUTHORIZED REPRESENTATIVE REVIEW

I certify that inspection and acceptance of the listed items has been made by me or under my supervision, except as noted herein or in supporting documents.

[Signature]
Customer Authorized representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM

Page 1 of 1

CUSTOMER: Riviera Engineering

DATE: MAY 20, 02

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads Ceiba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{am}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:00</u>	<u>8</u>	<u>.30</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>W.C. Truck</u>		<u>1</u>	<u>7:30^{am}</u>	<u>12:00</u>	<u>1:00</u>	<u>5:00</u>	

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

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E. Schmidt
Contractor's Authorized Representative

CUSTOMER/AUTHORIZED REPRESENTATIVE REVIEW

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[Signature]
Customer's Authorized representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM

Page 1 of 1

CUSTOMER: Riviera Engineering

DATE: May 22/02

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads Ceiba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{AM}</u>	<u>4:30</u>			<u>8</u>	<u>1.0</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>VAC. Truck</u>		<u>1</u>	<u>7:30^{AM}</u>	<u>4:30</u>			

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

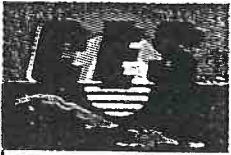
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John Schmidt
Contractor's Authorized Representative

CUSTOMER/AUTHORIZED REPRESENTATIVE REVIEW

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A. J. [Signature]
Customer Authorized Representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM

Page 1 of 1

CUSTOMER: Riviera Engineering

DATE: May 23 / 07

CESI JOB NUMBER _____

LOCATION: Roosevelt Road Ceiba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>E. Schmidt</u>	<u>Operator</u>	<u>7:30^{AM}</u>	<u>5:00^{PM}</u>			<u>8</u>	<u>1.30</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>Van Truck</u>		<u>1</u>	<u>7:30^{AM}</u>	<u>5:00^{PM}</u>			

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

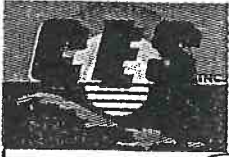
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[Signature]
Contractor's Authorized Representative

CUSTOMER AUTHORIZED REPRESENTATIVE REVIEW

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[Signature]
Customer Authorized Representative



**CARIBBEAN ENVIRORESPONSE SERVICES, INC.
DAILY RESOURCE REPORT**

SHORT FORM

Page 1 of 1

CUSTOMER: Riviera Engineering

DATE: Mayo 28/02

CESI JOB NUMBER _____

LOCATION: Roosevelt Roads Ceiba

PERSONNEL

NAME	JOB DESCRIPTION	FROM	TO	FROM	TO	REGULAR HOURS	OVERTIME HOURS
<u>L. Schmidt</u>	<u>Operator</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>12:30</u>	<u>5:00^{PM}</u>	<u>8</u>	<u>.30</u>

EQUIPMENT

DESCRIPTION	RATE BASIS	NO. OF UNITS	FROM	TO	FROM	TO	COMMENTS
<u>VAC. TRUCK</u>		<u>1</u>	<u>7:30^{AM}</u>	<u>12:00</u>	<u>12:30</u>	<u>5:00^{PM}</u>	

SERVICES

DESCRIPTION	SUB-CONTRACTOR	QUANTITY	COMMENTS

MATERIALS USED/OTHER EXPENSES

DESCRIPTION	RATE BASIS	NO. OF UNITS	COMMENTS

CONTRACTOR'S CERTIFICATION

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Robert Schmidt
Contractor's Authorized Representative

CUSTOMER/AUTHORIZED REPRESENTATIVE REVIEW

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J. Weather
Customer/Authorized representative



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

J-17 Pre-Implementation Meeting Minutes



MEETING RECORD



PROJECT NO: 065/7074-18

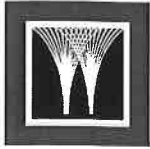
PROJECT: ENGINEERING SERVICES FOR PIPELINES AT ROOSEVELT ROADS PUERTO RICO

Pre-Implementation Meeting

Table with meeting details including Participant Name & Organization, Meeting Date (March 12-14, 2002), Client (Terri Regin, James Rice, etc.), Worley (Kirsten Glesne, Dale England, etc.), Doc No (0707418/G41-0242D), Location (Roosevelt Roads, Puerto Rico), File Loc, Recorder (Kirsten Glesne), Signature Originator, Date Signed, Copies, and Purpose of Meeting.

RECORD OF DISCUSSIONS

Table with 3 columns: ITEM, ITEM DETAILS, and CONTACT PERSONNEL. It contains three items: a note about the meeting, a meeting agenda reference, and a project description with contact TR.



MEETING RECORD



ITEM	ITEM DETAILS	CONTACT PERSONNEL
4.	Security clearances – All on-site personnel will have to obtain security clearance from security office. Letter of good conduct will be required. A certain number of electronic keys will be issued to gain access to the tank farms. Security will also handle the distribution. Additional training and passes will need to be obtained for flight line access. TR and Worley to verify with security any additional requirements.	Base Security
5.	Medical Treatment – Medical treatment on base will only be handled if it is an emergency. All other treatment needs to be handled off base. Emergency number is 787-865-4144	
6.	Fire – Emergency number for fire x4333	
7.	ROICC will coordinate if any utilities are required. Cypress Creek and Worley indicated that none should be needed.	FC
8.	Working Hours – Fuels hours are M-F 7:00-17:30. Worley requested to work six tens. This will be worked out with fuels if overtime of personnel is not greatly affected. Fuels understand that in a tie-in situation overtime may be necessary to get pipeline back into service.	JR/KG
9.	Vacuum Truck – JA Jones has contract for base vacuum truck. They are difficult to schedule. Worley will acquire outside services during tie-in to assure availability of vac trucks.	KG
10.	Ground Water/Valve Pit Water Discharge – Fuels will empty pits of initial water. Any additional ground or rainwater that is introduced can be discharged to the ground if there is not sheen present. A record of the discharge amount is to be kept. Water with sheen will be pumped to an oil water separator.	JR/KG/PR
11.	Hot Work Permits – Fire Department will issue hot work permits. One-day notice is required. Fire Department will require calibration log of gas detector. Contact at X3253. Weekly hot work permit will be approved for fabrication yard. Daily permit will be required for tie-in locations.	A. Ramirez – Fire Chief Inspector
12.	Building Permit – Worley to submit a building permit for entire project at least 15 days prior to construction to Public Works. This will get the approval of all interested parties.	Pedro Calderon
13.	Digging Permits– Worley to submit a digging permit application at least 15 days prior to construction to help identify location of underground utilities.	Luis Colon/KG
14.	Progress Schedule – A daily production report and bi-weekly production reports will be submitted to TR.	KG
15.	Solid wastes need to be disposed of off base. If amount is less than 15 CY per week over the duration of the project, no permitting is required. Worley will obtain necessary paperwork to assure waste is disposed of by proper means.	Madeline Rivera
16.	Contaminated Soil - If any contaminated soil is found, Worley will place it on plastic and contact the environmental group as to how to handle. Base will assume the costs associated with previously contaminated soil that in encountered.	PR/ Madeline Rivera
17.	Disposal of pipe and valves will be handled through DRMO and not taken off base. DRMO contact Julio Ocasio at 865-4903. Form 1348-1A must accompany any materials for disposal.	KG



MEETING RECORD



ITEM	ITEM DETAILS	CONTACT PERSONNEL
18.	Sand and dirt for additional backfill will be brought from off base.	KG/BT
19.	If any trees need to be removed, environmental will need to be notified. None are anticipated at this time.	PR/KG
20.	Fuels will make radios available to Worley as needed for tie-ins and construction work.	KG/JR
21.	Fuels will turn rectifiers off prior to any welding.	JR
22.	Painting – Fabricated fittings will be taken off base for sand blasting and permitting by an outside contractor in a controlled atmosphere. Valves and field welds will be wire brushed and hand painted. Permitting will not be required.	Madeline Rivera/KG
23.	An Air Emissions Permit will not be required if excavation is less than 900 sq mtrs.	Madeline Rivera/KG
24.	A letter stating the type of work being conducted will be drafted up by Worley and submitted to environmental for the file to identify that no EQB permits are required.	Madeline Rivera/KG
25.	Valve pit 1 on the flight line does not contain any valves and will be removed from the scope.	TR/KG
26.	VP 7A - 2" drain valve will be replaced during drain-up.	JR/KG
27.	VP6 - valve will be removed, but 2" drain and vent will remain and pit will not be demolished.	TR/KG
28.	PH 466 – Install two 12" DB valves in place of existing valves.	TR/KG
29.	Nitrogen can be obtained on base, but cylinders will need to be obtained off base. JR will set up an account and LOCS plant.	KG/JR/BT
30.	Construction start-up date has been delay to April 15, 2002 due to base operations.	KG/TR

END OF RECORDS



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS**

NAVSTA ROOSEVELT ROADS, PUERTO RICO

J-18 QC Meeting Minutes



QC MEETING RECORD

Project No : 7074-18

To: Terri Regin

CC: Attendees

From: Jeanette Edge

Date: April 25, 2002

Location: Public Works Building 30

Re: QC Meeting

Site meeting Minutes

Attendees: Kirsten Glesne; Worley International, Inc.
Jeanette Edge; Worley International Inc
Lt. Greg Bergado; ROICC
Frank Cortez; ROICC
Bill Tull; Cypress Creek
Sonny Weathers; DiversiCom

The following issues regarding safety on site was brought to attention:

- i) Requested warning signs to be placed near each pit
- ii) Fences are to be placed at least 3ft from pit
- iii) Rebar present in pits is to be cut to a short length, or bent at an angle to ensure public safety
- iv) Need to refer to on site US Corp of Engineers Health and Safety Manual. Copy is available on the Internet. Many items similar to OSHA
- v) OSHA safety must be enforced
- vi) Life jackets do not have to be worn near the piers for locations of Worley's work.



QA MEETING RECORD

- vii) Lt. Greg Bergado will inform us with the details for work taking place on the Piers as well as on the Air Field.
- viii) Pier access letter will be given to Worley by end of day.
- ix) LT indicated that the driving class was not necessary for the location of work inside airfield. He will set up a meeting and verify.
- x) It was requested that a weekly schedule be e-mailed detailing the locations of work to be taking place for that week.
- xi) LT requested copy of Worley/Cypress Health and Safety Plan. Kirsten to deliver the next day.
- xii) On-site QC for welding was identified as Sonny; general QC for the project will be Kirsten. All personnel are responsible for safety.



QA MEETING RECORD

Project No : 7074-18
To: Terri Regin
CC: Attendees
From: Jeanette Edge
Date: April 26/02
Location: Fuels Depot Lunchroom
Re: QC Meeting

Site meeting Minutes

Attendees: Kirsten Glesne; Worley International, Inc.
Jeanette Edge; Worley International Inc.
Jim Rice; Deputy Fuels Officer
Carlos Brown; Operations Forman
Bill Tull; Cypress Creek
Sonny Weathers; DiversiCom

The purpose of this meeting was to discuss scheduling of the project. Attached schedule gives detail of project work. The following are dates that are of importance and will affect the schedule if changed:

- i) May 23 - 26, 2002; Tanker requesting JP5.
- ii) April 25 - 30, 2002; Transfer JP5 to airfield.
- iii) May 1-2, 2002; Transfer JP-5 from tank 2270.
- iv) May 3, 2002; Drain JP5 line by fuels.
- v) May 3-15, 2002; JP5 line will be out of service.
- vi) April 29, 2002; DFM-S will be out of service to begin tie-ins. Fuels to begin drain-up prior to this.



QA MEETING RECORD

- vii) May 15, 2002; DFM drain up.
- viii) May 15 – 18, 2002; both DFM lines will be out of service.
- ix) Tie-in of JP-5 launcher and receiver will require a second drain-up of JP-5 pipelines, as funds will not be approved soon enough.

It was also mentioned that there is a 6" valve that needs to be removed from tank 1080 and place in tank 83. Also near VP9-S need to look at vent line to see what kind of condition it is in.

Location of lock out valves and isolation valves was determined for each pipeline. DFM and DFM-S lines will be required to be out of service at the same time to enable proper isolation for work on DFM-S VP-9. Tie-in and lock out procedures will be developed prior to work commencing on the JP-5 pipeline.



QC MEETING RECORD

Project Number: 7074-18

To: Terri Regin

CC: Attendees

From: Jeanette Edge

Date: May 2, 2002

Location: Public Works Building ROICC Office

RE: QC Meeting

Attendees:

LTJG Greg Bergado	AROICC
James Rice	Dep. Dir. Fuels
Frank Cortez	ROICC Office
CW02 Claye	Air Ops / Field Sys.
ABE (AW) Johnson	Air Ops / Field Sys.
Kirsten Glesne	Worley International Inc
Jeanette Edge	Worley International Inc

Near hanger 200 there is a valve pit (VP2) JP-5 line covered with a cement lid. It is requested that contractors with Worley International Inc. have permission to remove this cement lid with a rubber tire backhoe to determine what exactly is in the pit. It was stated that this is a shallow pit, and that removal of the lid should be successful using a backhoe.

Modifications that are to be made to the pit include removing one valve and replacing it with another DB& B valve. This procedure includes one weld, depending on how close the valve is to the pit walls.



QC MEETING RECORD

It was noted that there is a ditch near the valve pit that is know to be soggy due to a broken water line near the area. Contractors are to proceed with caution.

Kirsten requested to remove the lid by the end of the week, whenever it was convient for the Air Ops to escort the backhoe and personnel on site. The drain up for the JP-5 line will be completed on Wednesday or Thursday next week.

In order to complete this section of the project the following are to take place:

- 1st: Move the cement lid. This will take approximately 1 hour.
- 2nd: Drain the line of fuel using the Vac Truck. This will take approximately 1 day.
- 3rd: Remove old valve and replace it with new. This will take approximately 1 day.

The following issues were brought up regarding safety and procedure to be followed:

- Track hoe, welding truck, and personnel vehicles allowed on Air Field
- Minimum number of personnel at all times
- Fuels will have a representative occasionally on site
- Air Field representative will escort contractors on site for the initial set up and show the optimal route to travel to the pit with the equipment. Worley is to contact Air Ops representatives when work is complete for escort off site.
- Worley does not need air field training to obtain access to the pit
- A radio connected to the tower radio is recommended for emergency purposes
- Worley is to coordinate leaving the vac truck on the taxiway with airfield personnel.
- There is no need to put up warning fencing around the pit, the hanger near by is out of commission therefore there will be minimal traffic in this area.
- Hard hats are not permitted in this area.



QC MEETING RECORD

Issues regarding communication pole located near VP5 which is in the way of demolishing the pit. Roberto Colon, public works, and Calab, Main Controls Division, are to give the go ahead for excavation near this pit.

It was recommended that Exit 5, near Air Field and Fire Dept, is to be used for the removal of filters and installation of skillets in VP .



QC MEETING RECORD

Project Number: 7074-18

To: Terri Regin

CC: Attendees

From: Jeanette Edge

Date: May 9, 2002

Location: Public Works Building ROICC Office

RE: QC Meeting

Attendees:

LTJG Greg Bergado	AROICC
Pablo Assairo	Public Works
Kirsten Glesne	Worley International Inc
Jeanette Edge	Worley International Inc

Arrangements have been made for JA Jones to hold the communications line located near VP 5, JP-5 line on Tuesday, May 12, 2002 at 7:30 for the day. It was stressed in this meeting that all work will be completed on this day, and could possibly take longer than a regular 8 hour working day.

The urgency of the completion of this task is due to the arrival of a tank full of JP-5 fuel on May 19th. All work on the JP-5 line must be completed at this time.

Contact names:

Tony Hernadiáz	Electrical Supervisor	787-502-9503 (Cell)
Navy Base	Work Control	787-865-4057



MEMORANDUM

DATE August 24, 2002

TO Terri Regin - NFESC ECDET

FROM Kirsten Glesne

COPY Lt. Feliz (Fuels)

PROJECT 065/7074-18

SUBJECT Contract N47408-99-D-8014, D. O. 0018
NAVSTA Roosevelt Roads, Ceiba, Puerto Rico
Incident Report

DOC NO 0707418_G11_0792D

Incident:

Spill of JP-5 fuel inside Pier 3 Pump House during injection of SF₆ gas to be used for leak detection on pipeline on Thursday, August 22, 2002 at approximately 15:00.

Background of Incident:

The JP-5 pipeline from VP 24 to Pier 3 PH has a potential leak. Alpha Leak Detection was brought on-site to assist in finding the potential leak. Prior to arrival of Worley and Alpha on site, the Fuels Depot removed the 12-inch DBB valve at Pier 3 PH and drained as much fuel as possible through a 1 ½" hose that was inserted in the 90-degree elbows. It was understood that some residual product would still be present in the pipeline. Blind flanges were installed on the Pier 3 PH where the valve was removed.

Description of Incident:

The 1-inch ball valve at Pier 3 PH was opened to vent the SF₆ gas and verify when it has reached the Pier. The blind flange remained on the valve, but was loosened. SF₆ was injected at a low pressure (<15 psi) at VP 24. Once injection began, Alpha and Worley personnel proceeded to Pier 3 PH to verify if SF₆ gas had arrived. Upon arrival, fuel was spraying out of the 1-inch vent. The 1-inch valve was closed and a call was made to shut down the injection of the SF₆ gas. All fuel was contained inside the concrete of the Pier 3 PH. The blind flange prevented the fuel from spraying up and aided in keeping the fuel in the containment. Fuels personnel were notified and a vac truck was brought to the site for clean up and fuel drain-up. Once the fuel was cleaned-up the pipeline was drained from a low-pint valve inside Pier 3 PH into a pan and vac truck. Nitrogen was injected to move the fuel to the Pier 3 end and verify that the pipeline was completely drained.

Prevention of Incident:

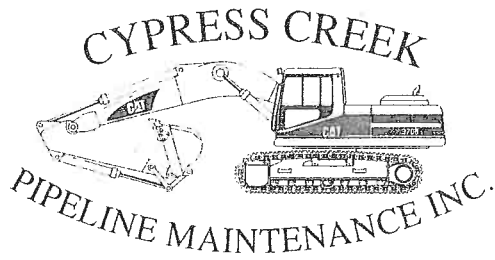
- Vent valve should be manned at all times to assure it is closed if fuel is present.
- The pipeline should be pigged under a controlled environment to assure pipeline is evacuated prior to injected SF₆ gas.
- If pigging is not practical, nitrogen should be injected at a higher pressure to push fuel to the end and drained under a controlled environment.



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS**

NAVSTA ROOSEVELT ROADS, PUERTO RICO

J-19 Safety Meeting Sign-In Forms



Mailing: P.O. Box 3099 • Pearland, TX 77588 Location: 5625 W. Orange St. • Pearland, TX 77581
Phone: (281) 412-2400 • Fax: (281) 412-2727

SAFETY MEETING DOCUMENTATION FORM

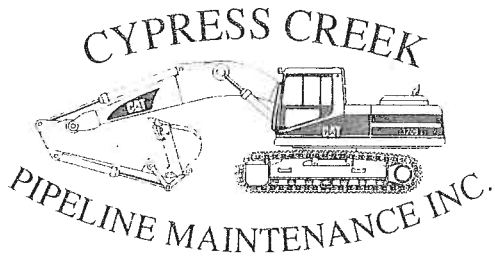
DATE: WED. 4-17-02 LOCATION: ROOSEVELT ROADS TIME: 7:15 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Jull			
Warren Hawthorness			
James McCall			
Stephen E. Dundy			
HUGO Delgado			
Jose m. Lopez			
Armando Espitia			
JOSE T AGUILERA			
Shawn Hartness			
Kirsten Stegner			
Jeanette Edge			
W. L. Weather			



Mailing: P.O. Box 3099 • Pearland, TX 77588 Location: 5625 W. Orange St. • Pearland, TX 77581
 Phone: (281) 412-2400 • Fax: (281) 412-2727

SAFETY MEETING DOCUMENTATION FORM

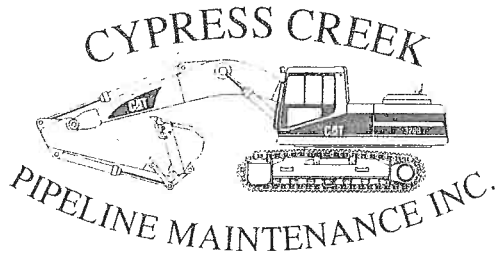
DATE: THUR. 4-18-02 LOCATION: _____ TIME: 7:15 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Bull</i>			
<i>James McCall</i>			
<i>JOSIE T AGUILERA</i>			
<i>Jose m. Lopez</i>			
<i>Armando Espitia</i>			
<i>HUGO DELGADO</i>			
<i>Stephen E Dundy</i>			
<i>Wancy Heertess</i>			
<i>Shawn Hart Jorress</i>			
<i>Janette Edge</i>			
<i>Reynolds G.</i>			
<i>X M Leslie</i>			



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 Phone: (281) 412-2400 • Fax: (281) 412-2727

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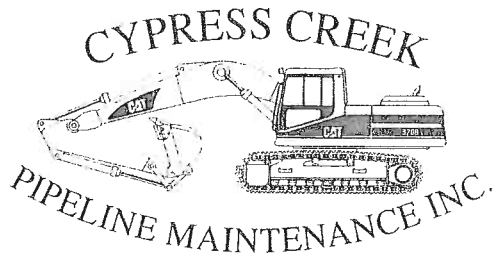
DATE: FRI. 4-19-02 LOCATION: ROOSEVELT ROADS TIME: 7:10 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Darcel Boutros</i>			
<i>Karen Slesno</i>			
<i>Janette Edge</i>			
<i>P. E. Weather</i>			
<i>Sharon Hartness</i>			
JAMES McCall			
<i>Stephen E. Smith</i>			
<i>Armando ESPITIA</i>			
<i>HUGO Delgado</i>			
JOSÉ TRAGUILLER			
<i>Bill Smith</i>			



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Phone: (281) 412-2400 • Fax: (281) 412-2727

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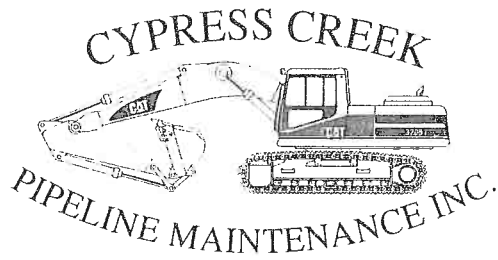
DATE: SAT. 4-20-02 LOCATION: ROOSEVELT ROADS TIME: 7:15 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Full</i>			
<i>H.E. Weather</i>			
<i>James m (L)</i>			
<i>Stephen E. Dundy</i>			
<i>Hugo Delgado</i>			
<i>Armando Espitia</i>			
<i>Dancy Fuentes</i>			
<i>Sharon Hardness</i>			
<i>JOSE TAGUILERA</i>			
<i>Jeanette Edge</i>			



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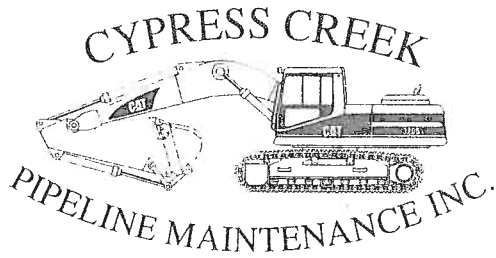
DATE: MON. 4-22-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Tull</i>			
<i>Hgo Delgado</i>			
<i>Armando Espitia</i>			
<i>JOSE T AGUILERA</i>			
<i>Warcup Santos</i>			
<i>Shawn Hartness</i>			
<i>Jose m. Lopez</i>			
<i>Stephen C Gundy</i>			
<i>Jimbo McCall</i>			



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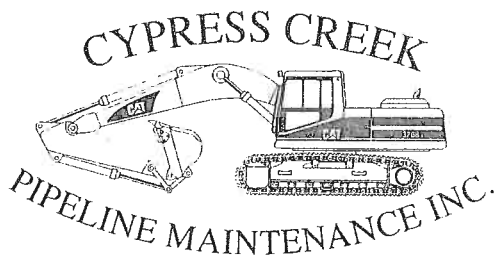
DATE: TUE. 4-23-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Lull</i>			
<i>Manuel Garcia</i>			
<i>Shawn Hartness</i>			
<i>James Mitchell</i>			
<i>Jose m. Lopez</i>			
<i>Stephen E. Dundy</i>			
<i>Armando Espitia</i>			
<i>Hugo Delgado</i>			
<i>JOSE T. Aguilera</i>			
<i>G. E. Weather</i>			



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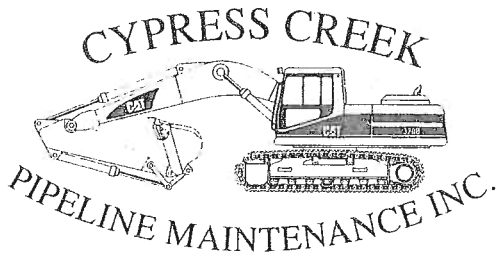
DATE: WED. 4-24-02 LOCATION: ROOSEVELT ROADS TIME: 7:10 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Tull			
Jose m. Lopez			
HUGO Delgado			
Armando Espitia			
Jimbo McCall			
JOSE T. AGUILERA			
Stephen E. Bundy			
Wance Young			
Shawn Hardness			
H. M. Watts, Jr.			



Mailing: P.O. Box 3099 • Pearland, TX 77588 Location: 5625 W. Orange St. • Pearland, TX 77581
 Phone: (281) 412-2400 • Fax: (281) 412-2727

SAFETY MEETING DOCUMENTATION FORM

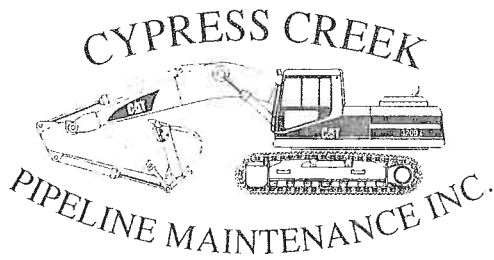
DATE: THUR. 4-25-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
<i>Shawn Hartness</i>			
<i>Darcy Hartness</i>			
<i>Jimbo McCall</i>			
<i>Jose m. Lopez</i>			
<i>JOSE T AGUILERA</i>			
<i>Armando ESPITIA</i>			
<i>HUGO Delgado</i>			
<i>W.E. Weather</i>			
<i>Stephen E. Jandy</i>			



Mailing: P.O. Box 3099 • Pearland, TX 77588 Location: 5625 W. Orange St. • Pearland, TX 77581
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SAFETY MEETING DOCUMENTATION FORM

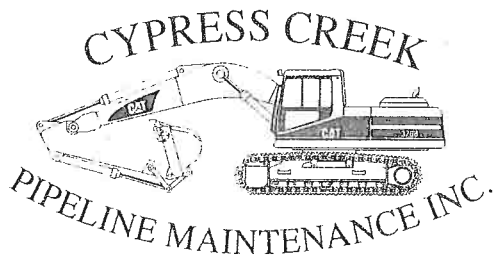
DATE: FRI. 4-26-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Judd</i>			
<i>Shawn Hartness</i>			
<i>Wanda Hartness</i>			
<i>Jim McCel</i>			
<i>Jose m. Lopez</i>			
<i>Armando Espitia</i>			
<i>Stephen C. Smith</i>			
<i>JOSE T AGUILERA</i>			
<i>HUGO Delgado</i>			
<i>R. Weather</i>			



Mailing: P.O. Box 3099 • Pearland, TX 77588 Location: 5625 W. Orange St. • Pearland, TX 77581
Phone: (281) 412-2400 • Fax: (281) 412-2727

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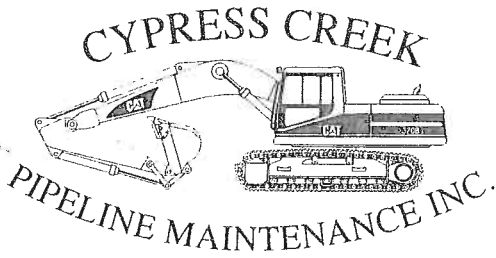
DATE: SAT. 4-27-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill [unclear]</i>			
<i>Wancey Hantros</i>			
<i>Shaw Hartness</i>			
<i>Jose m. Lopez</i>			
<i>Armando Espitia</i>			
<i>JOSE T AGUILERA</i>			
<i>HUGO Delgado</i>			
<i>Stephen [unclear]</i>			
<i>Jim [unclear]</i>			
<i>A.L. [unclear]</i>			



Mailing: P.O. Box 3099 • Pearland, TX 77588 Location: 5625 W. Orange St. • Pearland, TX 77581
Phone: (281) 412-2400 • Fax: (281) 412-2727

SAFETY MEETING DOCUMENTATION FORM

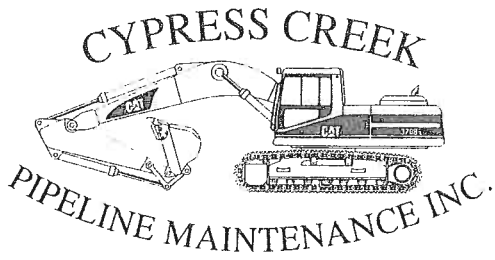
DATE: MON. 4-29-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM.

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<u>Bill Bull</u>			
<u>Jose Lopez</u>			
<u>Wancy Hantinas</u>			
<u>Armando Espitia</u>			
<u>Jimbo McCall</u>			
<u>HUGO Delgado</u>			
<u>JOSÉ TAGUILLERA</u>			
<u>Shawn Madness</u>			
<u>W.E. Weather</u>			



Mailing: P.O. Box 3099 • Pearland, TX 77588 Location: 5625 W. Orange St. • Pearland, TX 77581
Phone: (281) 412-2400 • Fax: (281) 412-2727

SAFETY MEETING DOCUMENTATION FORM

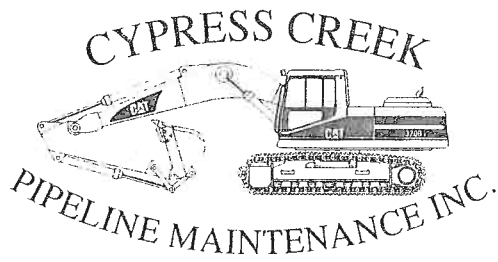
DATE: TUE. 4-30-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Gull			
Shawn Hartness			
Wanculla			
HUGO DELGADO			
Armando Espitia			
JOSÉ TAGUILLERA			
Jose Lopez			
Stephen E. Gunders			
Jimbo McCall			
D. Weather			



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SAFETY MEETING DOCUMENTATION FORM

WED.

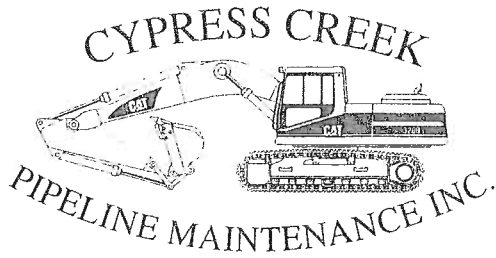
DATE: 5-01-02 LOCATION: ROOSEVELT ROADS TIME: 7:10 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
HUGO Delegado			
Wance HARTNESS			
Shawn HARTNESS			
<i>if L. Weather, J</i>			
Armando ESPITIA			
JOSE T AGUILERA			
Jose M. Lopez			
<i>Stephen E Jundy</i>			
<i>Jim M Hall</i>			



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SAFETY MEETING DOCUMENTATION FORM

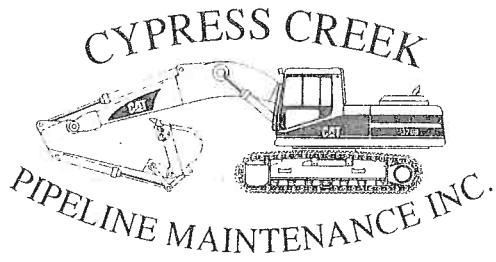
DATE: THUR. 5-2-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Tull			
Jimmy McCall			
H.E. Weather, Jr			
Stephen P. ...			
Shawn ...			
Armando ESPITIA			
JOSÉ T. AGUILAR			
Jose m. Lopez			
HUGO DELGADO			
Wancy ...			



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SAFETY MEETING DOCUMENTATION FORM

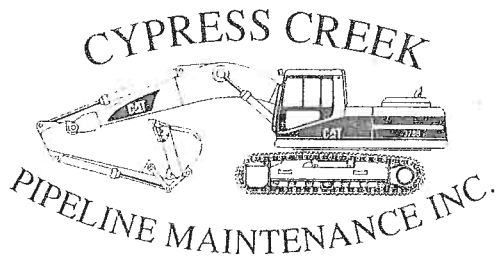
DATE: FRI. 5-3-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Gull</i>			
<i>Jim So m ccd</i>			
<i>Warry [Signature]</i>			
<i>Shawn Partness</i>			
<i>d. E. Weather</i>			
<i>Stephen [Signature]</i>			
<i>JOSE T AGUILERA</i>			
<i>Armardo ESPITA</i>			
<i>Jose m. Lopez</i>			
<i>HUGO Delgado</i>			
<i>[Signature]</i>			



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SAFETY MEETING DOCUMENTATION FORM

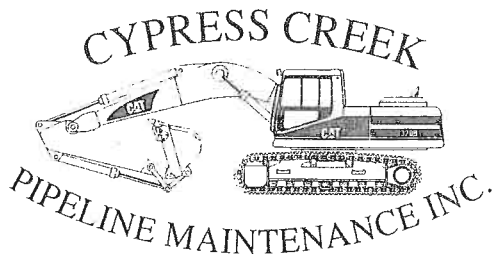
DATE: SAT. 5-4-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM.

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
HUGO Delgado			
Jose m. Lopez			
JOSE T AGUILERA			
Armando ESPINA			
Shawn Hartness			
Bill [unclear]			
[Signature]			
[Signature]			
Stephen P. [unclear]			
A. E. [unclear]			



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SAFETY MEETING DOCUMENTATION FORM

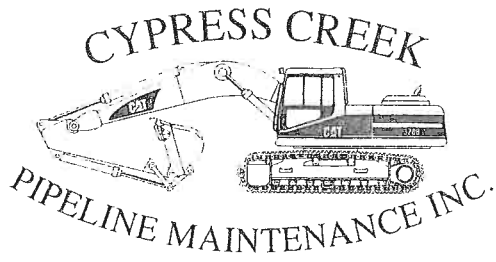
DATE: MON, 5-6-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM.

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Art Inull</i>			
<i>Armando Espitia</i>			
<i>HUGO Delgado</i>			
<i>Jose m. Lopez</i>			
<i>JOSE T AGUILERA</i>			
<i>Shawn Hartness</i>			
<i>Edwin Schmidt</i>			
<i>JIMBO McCall</i>			
<i>Steve Weather</i>			
<i>Stephen E. Dundy</i>			
<i>Wally Fautras</i>			



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SAFETY MEETING DOCUMENTATION FORM

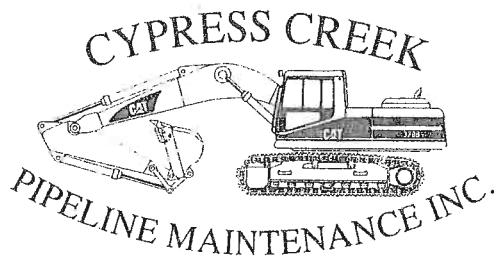
DATE: TUE, 5-7-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Bull</i>			
HUGO Delgado			
Jose m. Lopez			
Armando Espitia			
Jimbo McCall			
Shava Hardness			
<i>Wancey...</i>			
JOSÉ TO ASQUILERA			
Stephen C. Gandy			
<i>W. Weather...</i>			



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SAFETY MEETING DOCUMENTATION FORM

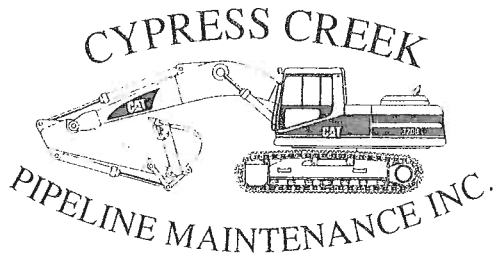
DATE: WED 5-8-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Jull			
Jimbo McCall			
M. E. Weather			
Wancy Hart			
Hugo Delgado			
Stephen C. Sturdy			
Armando Espitia			
Jose Lopez			
JOSE T. AGUILERA			
Shawn Hartness			



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SAFETY MEETING DOCUMENTATION FORM

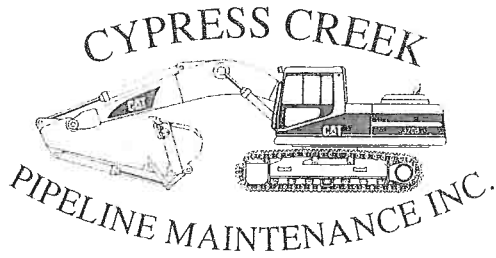
DATE: THUR. 5-9-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Gull</i>			
<i>Jimbo McCoil</i>			
<i>R. E. Weather</i>			
<i>Shawn Hardness</i>			
<i>Stephen E. Smith</i>			
<i>Dancye [unclear]</i>			
<i>Jose Lopez</i>			
<i>JOSE T AGUILERA</i>			
<i>Armando Espitia</i>			
<i>HUGO delgado</i>			



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SAFETY MEETING DOCUMENTATION FORM

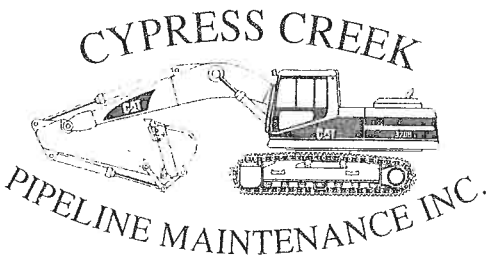
DATE: FRI. 5-10-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Pat Dull</i>			
<i>Shaun Hartman</i>			
<i>Wenceslaw</i>			
<i>Stephen</i>			
<i>HUGO Delgado</i>			
<i>JOSE T AGUILAR</i>			
<i>A. Elizalde</i>			
<i>Armando ESPINOSA</i>			
<i>Jose Lopez</i>			
<i>JIMBO McCall</i>			



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SAFETY MEETING DOCUMENTATION FORM

DATE: SAT. 5-11-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

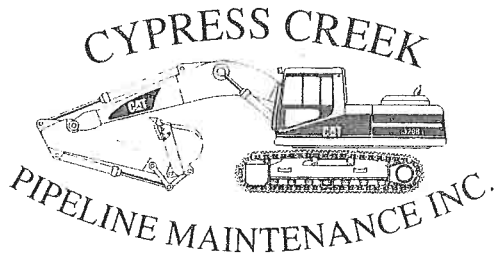
General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>[Signature]</i>			
<i>[Signature]</i>			
Shawn Hartness			
Jimbo McCall			
Jose Lopez			
Armando Espitia			
JOSE T ASUILETA			
HUGO Delgado			
Stephen [Signature]			
H. [Signature]			

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SAFETY MEETING DOCUMENTATION FORM

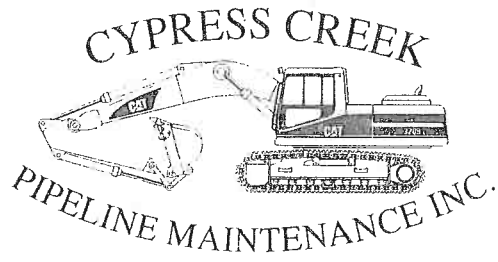
DATE: MON. 5-13-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Lull</i>			
<i>Jose Lopez</i>			
<i>JOSE TAGUILERA</i>			
<i>HUGO Delgado</i>			
<i>Armando Espitia</i>			
<i>Stephen E. Hundy</i>			
<i>Shawn Hodness</i>			
<i>Jill McColl</i>			
<i>Edwin Schmidt</i>			



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SAFETY MEETING DOCUMENTATION FORM

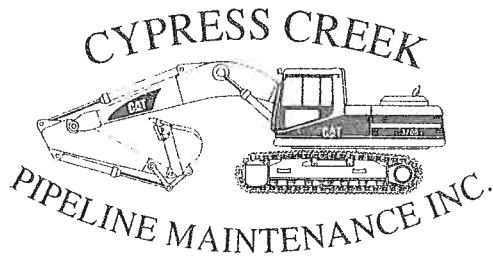
DATE: TUE. 5-14-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<u>Bill Tull</u>			
<u>Jim McCal</u>			
<u>Shawn Barkness</u>			
<u>Wally [unclear]</u>			
<u>Stephen [unclear]</u>			
<u>Jose Lopez</u>			
<u>Armando Espitia</u>			
<u>J. Elkhart</u>			
<u>HUGO Delgado</u>			
<u>JOSÉ T AGUILAR</u>			
<u>Edwin Schaist</u>			



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SAFETY MEETING DOCUMENTATION FORM

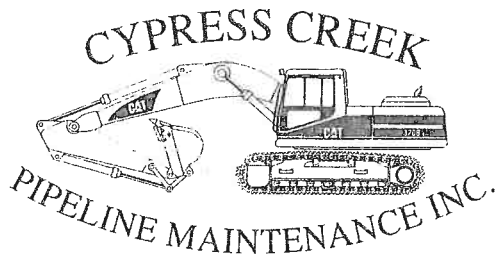
DATE: WED. 5-15-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Tull			
Armando Espitia			
Wasey [unclear]			
Shawn [unclear]			
Edna Schmitt			
JOSÉ T. AGUILERA			
W. E. Weather Jr.			
HUGO Delgado			
Stephen C. Hundy			
Jimbo MacCoel			



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SAFETY MEETING DOCUMENTATION FORM

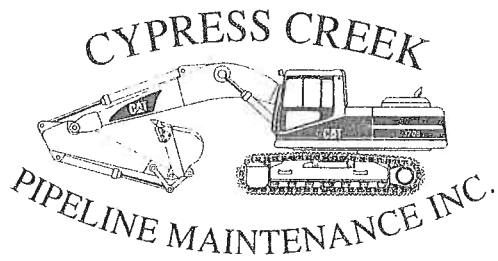
DATE: TAUR. 5-16-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Art G...</i>			
<i>W...</i>			
<i>Armando Espitia</i>			
<i>JOSE T AGUILAR</i>			
<i>Jose Lopez</i>			
<i>Edwin Schmidt</i>			
<i>Hugo delgado</i>			
<i>JIMBO McCall</i>			
<i>Shawn Hardness</i>			
<i>H. Weather...</i>			
<i>Stephen E. Ruddy</i>			



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SAFETY MEETING DOCUMENTATION FORM

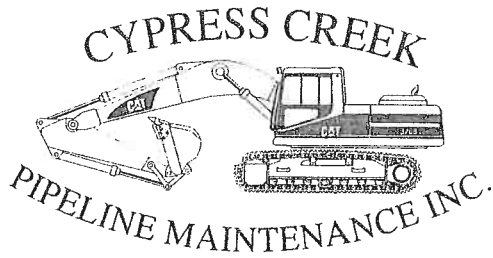
DATE: FRI. 5-17-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
<i>JOSE T AGUILAR</i>			
<i>Armando Espitia</i>			
<i>Edwin Schmidt</i>			
<i>Y. E. Weather</i>			
<i>Shawn Hartness</i>			
<i>Wanda Pautner</i>			
<i>Stephen E. Jandy</i>			
<i>Jimbo McCool</i>			
<i>Jose Lopez</i>			
<i>HUGO Delgado</i>			



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SAFETY MEETING DOCUMENTATION FORM

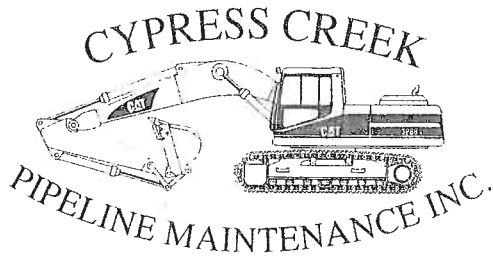
DATE: SAT. 5-18-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM.

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Inall			
Waneu Haddess			
Armando Espitia			
HUGO Delgado			
JOSE T AGUILERA			
Edwin Schmidt			
J. L. Weather, Jr.			
Jose Lopez			
Stephen E. Stueck			
Jimbo McEd			



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Phone: (281) 412-2400 • Fax: (281) 412-2727

SAFETY MEETING DOCUMENTATION FORM

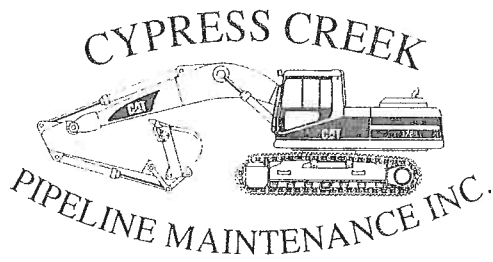
DATE: MON. 5-20-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Inall</i>			
<i>Jimbo McCull</i>			
<i>Armando Espitia</i>			
<i>Jose Lopez</i>			
<i>JOSE T AGUILERA</i>			
<i>Hugo Delgado</i>			
<i>Edwin Schmidt</i>			
<i>Stephen C. Jundy</i>			
<i>Darcus [Signature]</i>			
<i>[Signature]</i>			
<i>Shawn Hertness</i>			



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Phone: (281) 412-2400 • Fax: (281) 412-2727

SAFETY MEETING DOCUMENTATION FORM

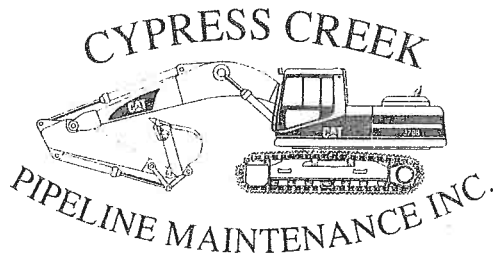
DATE: TUE. 5-21-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Tully</i>			
<i>Wancy Gutierrez</i>			
<i>Shawn Harbess</i>			
<i>JOSE T HGUILE</i>			
<i>Edwin Schmidt</i>			
<i>H. Elvardo J.</i>			
<i>Armando Espitia</i>			
<i>Jose Lopez</i>			
<i>Hugo Delgado</i>			
<i>Stephen E. Mundy</i>			
<i>Simbo McCall</i>			



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SAFETY MEETING DOCUMENTATION FORM

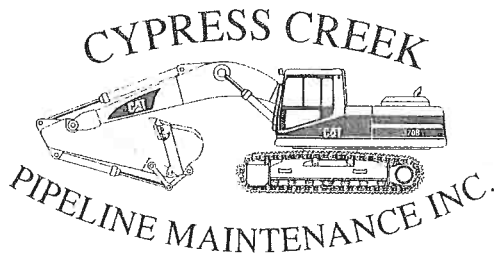
DATE: WED, 5-22-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
<i>JOSE T AGUILAR</i>			
<i>Armando Espitia</i>			
<i>Edwin Schmidt</i>			
<i>HUGO Delgado</i>			
<i>Jose Lopez</i>			
<i>Shawn Hartness</i>			
<i>JIMBO McCall</i>			
<i>Stephen E. Shady</i>			
<i>Bob Willis</i>			
<i>Wesley Hartness</i>			



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SAFETY MEETING DOCUMENTATION FORM

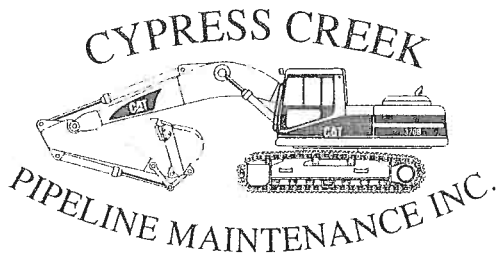
DATE: THUR. 5-23-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Inall			
Jimbo McCall			
JOSE T AGUILERA			
HUGO Delgado			
Armando Espitia			
Stephan Edm			
Wanda [unclear]			
Shawn Hartness			
Edwin Schmidt			
M. E. [unclear]			
Jose Lopez			



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SAFETY MEETING DOCUMENTATION FORM

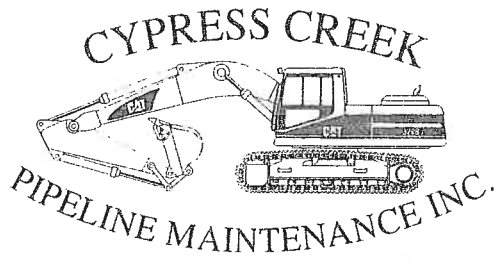
DATE: FRI. 5-24-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Dill Bull</i>			
<i>Dance Hartness</i>			
<i>Shawn Hartness</i>			
<i>H. J. Weather Jr.</i>			
<i>Simbo McCall</i>			
<i>Armando Espitia</i>			
<i>JOSE T AGUILERA</i>			
<i>Edwin Schmidt</i>			
<i>Stephen E. Sturdy</i>			
<i>HUGO Delgado</i>			
<i>Jose Lopez</i>			



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SAFETY MEETING DOCUMENTATION FORM

TUE.

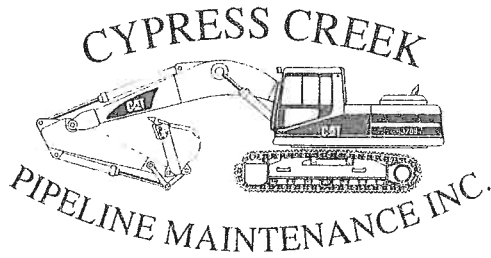
DATE: 5-28-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Inell			
Jim McCormick			
Bob Wiles			
Stephen E. Bundy			
HUGO Delgado			
JOSE T AGUILERA			
Armando Espite			
Jose Lopez			
Shawn Hardness			
Warcuff			
U. [unclear]			



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SAFETY MEETING DOCUMENTATION FORM

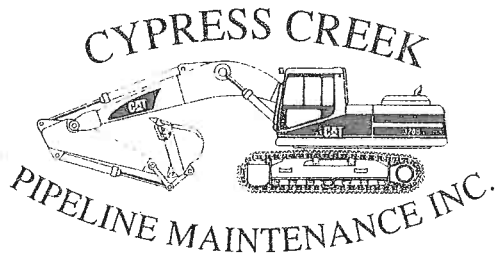
DATE: WED. 5-29-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
<i>Wanda Jull</i>			
<i>Thana Jull</i>			
<i>JOSE T AGUILERA</i>			
<i>Ch. E. Weather Jr</i>			
<i>Edwin Schmidt</i>			
<i>Bob Willis</i>			
<i>Armando Espitia</i>			
<i>Jose Lopez</i>			
<i>Stephen E. Jull</i>			
<i>Jim McCall</i>			
<i>HUGO Delgado</i>			
<i>Austen Moore</i>			



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SAFETY MEETING DOCUMENTATION FORM

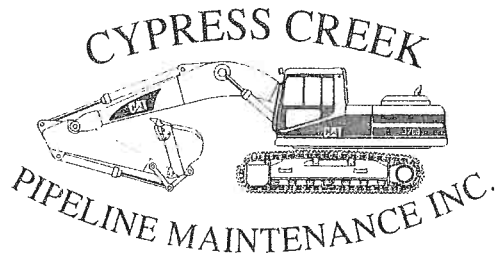
DATE: THUR. 5-30-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Hill</i>			
<i>Dancy [unclear]</i>			
<i>Shawn Hartness</i>			
<i>JOSE T AGUILERA</i>			
<i>H. E. Weather, Jr.</i>			
<i>Edwin Schmidt</i>			
<i>Bob Mills</i>			
<i>Armando ESPITIA</i>			
<i>Jose Lopez</i>			
<i>Stephen [unclear]</i>			
<i>J. M. McCall</i>			
<i>Hugo Delgado</i>			
<i>Bryan [unclear]</i>			



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SAFETY MEETING DOCUMENTATION FORM

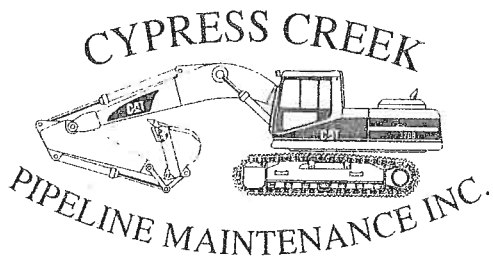
DATE: FRI. 8-31-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<u>Shawn Hartness</u>			
<u>Jose Lopez</u>			
<u>Jimbo McCall</u>			
<u>Edwin Schmidt</u>			
<u>Stephen E. Gundy</u>			
<u>Bob Wills</u>			
<u>JOSE T. AGUILAR</u>			
<u>Armando Espitia</u>			
<u>Hugo Delgado</u>			



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SAFETY MEETING DOCUMENTATION FORM

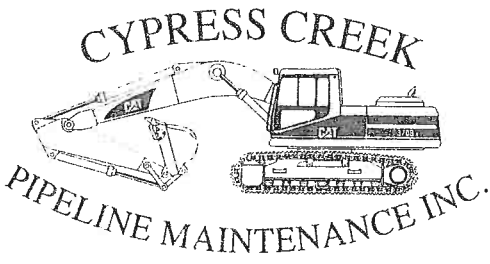
DATE: SAT. 6-1-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Pill Inull</i>			
<i>Shaun Hordness</i>			
<i>H. Weather, Jr</i>			
<i>Armando Espitia</i>			
<i>Wenceslao...</i>			
<i>Edwin Schmidt</i>			
<i>Bob Willis</i>			
<i>Jim L. McCull</i>			
<i>Stephen E. Mundy</i>			
<i>Jose Lopez</i>			
<i>HUGO Delgado</i>			
<i>JOSE T. Aguilera</i>			



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SAFETY MEETING DOCUMENTATION FORM

MON.

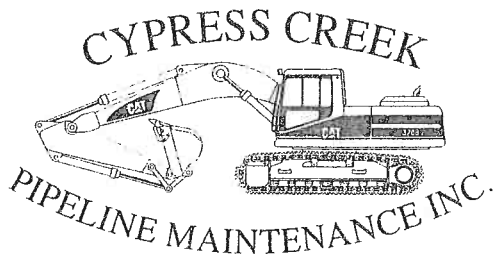
DATE: 6-3-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Wanda Harbress</i>			
<i>Wanda Harbress</i>			
<i>Stephen D. Smith</i>			
<i>W. E. [unclear]</i>			
<i>Bill [unclear]</i>			
<i>Jimbo McCall</i>			
<i>JOSE T AGUILERA</i>			
<i>Armando ESPINA</i>			
<i>Bob Wills</i>			
<i>Jose Lopez</i>			
<i>HUGO Delgado</i>			



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SAFETY MEETING DOCUMENTATION FORM

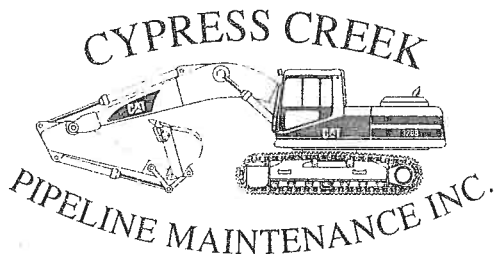
DATE: TUE. 6-4-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM.

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Bull</i>			
<i>Jimbo McCall</i>			
<i>Wanda Hester</i>			
<i>Shawn Hester</i>			
<i>G. Weather, Jr.</i>			
<i>JOSEF AGUILERA</i>			
<i>Armando Espitia</i>			
<i>HUGO Delgado</i>			
<i>Eduardo A. VELAZ</i>			
<i>Bob Wills</i>			
<i>Stephen E. Jundy</i>			



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SAFETY MEETING DOCUMENTATION FORM

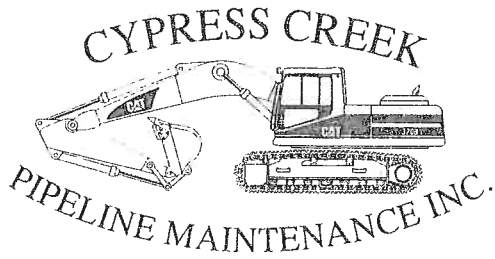
DATE: WED. 6-5-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Inell			
Shawn Harness			
Dorey Hendrix			
Bob Wilks			
D. Ellsworth			
JOSE T AGUILERA			
Jimbo McCree			
Stephen E. Sandy			
Armando ESPINOSA			
Jose Lopez			
HUGO DELGADO			
EDUARDO A. VELEZ			



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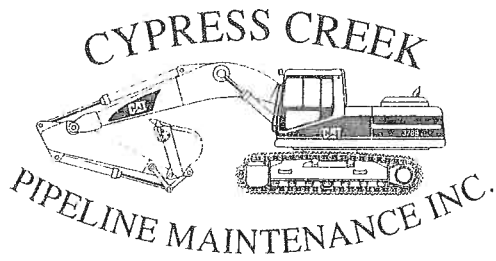
DATE: THUR. 6-6-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
<i>Wanda [unclear]</i>			
<i>Wanda [unclear]</i>			
<i>Jim Mucca</i>			
<i>Shawn Handness</i>			
<i>Jose Lopez</i>			
<i>Eduardo A Vilez</i>			
<i>Jose T Aguilera</i>			
<i>Bob Wills</i>			
<i>HUGO Delgado</i>			
<i>Armando Espitia</i>			
<i>Stephen E Sundry</i>			



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SAFETY MEETING DOCUMENTATION FORM

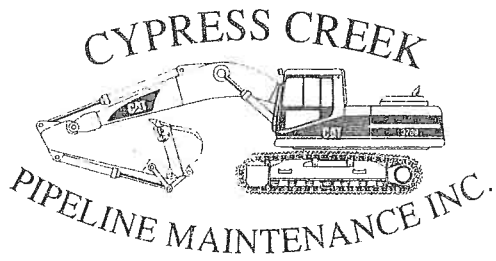
DATE: FRI. 6-7-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Jull			
Darcey Houtchens			
Armando Espitia			
Eduardo A. Velez			
Jose T. Aguilera			
Shawn Hardness			
H. E. Weather			
Stephen E. Slundy			
Bob Willis			
Jim McCall			
Jose Lopez			
Hugo Delgado			



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SAFETY MEETING DOCUMENTATION FORM

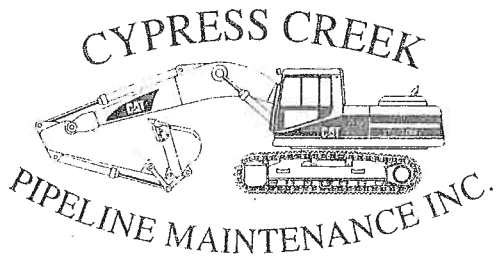
DATE: SAT. 6-8-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Tull			
Sharon Hartman			
Jose Lopez			
Jimbo McCall			
Ed. Weather J.			
Eduardo D. VECEZ			
Armando Espitia			
HUGO Delgado			
Wesley Harkins			



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SAFETY MEETING DOCUMENTATION FORM

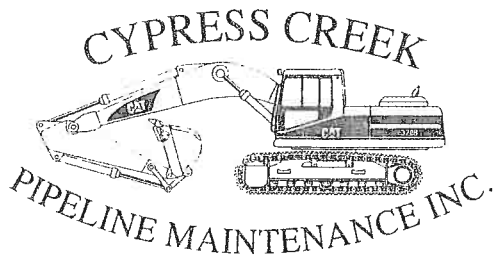
DATE: MON. 6-10-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Inull			
Shawn Hardness			
H. Edwards			
JOSE T AGUILERA			
Armando Espitia			
Bob Wills			
Eduardo A. VELEZ			
Jose Lopez			
Marco Hernandez			
Stephen E. Hardy			
HUGO Delgado			
Jimbo McCall			



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SAFETY MEETING DOCUMENTATION FORM

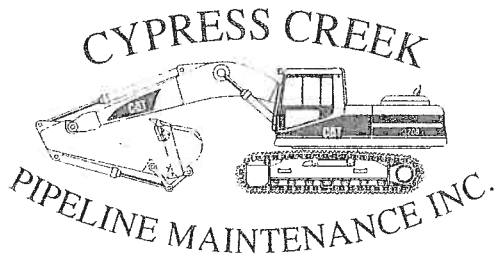
DATE: TUE. 6-11-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Jull			
Jean So MCCCOP			
Armando Espitia			
Eduardo A. VELEZ			
Shawn Handness			
H. E. Weather, Jr.			
Bob Willis			
Stephen E. Dundy			
HUGO Delgado			
Jose Lopez			
JOSE T AGUILERA			



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SAFETY MEETING DOCUMENTATION FORM

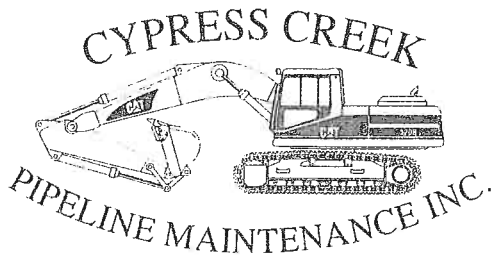
DATE: WED. 6-12-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
<i>Bob Wills</i>			
<i>Wenceslao Torres</i>			
<i>Shawn Hartness</i>			
<i>EDUARDO A. VELEZ</i>			
<i>Jimbo McCall</i>			
<i>Stephen P. Sandy</i>			
<i>D. Weather</i>			
<i>HUGO DELGADO</i>			
<i>Armando Espitia</i>			
<i>DOSIR T. AGUILERA</i>			
<i>Jose Lopez</i>			



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SAFETY MEETING DOCUMENTATION FORM

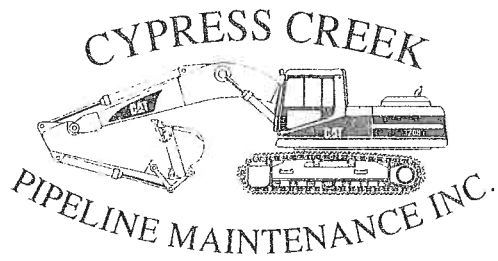
DATE: THUR. 6-13-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
<i>Wanda [Signature]</i>			
<i>Armando ESPINA</i>			
<i>JOSE T AGUILERA</i>			
<i>Stephen E. Mundy</i>			
<i>Eduardo A. VELAZ</i>			
<i>Jose Lopez</i>			
<i>Shawn Harness</i>			
<i>JIMBO McCall</i>			
<i>HUGO Delgado</i>			
<i>[Signature]</i>			
<i>Bob Will</i>			



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SAFETY MEETING DOCUMENTATION FORM

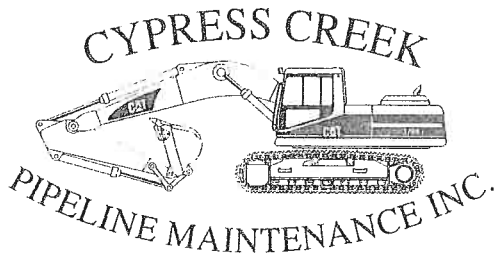
DATE: FRI. 6-14-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Sull			
Stephen E. Gundy			
Jim McCall			
Bob Willis			
Shawn Hardness			
Wenceslao Gutierrez			
Armando Espitia			
JOSE T. AGUILERA			
Eduardo A. Velez			
H. E. Weather			
Jose Lopez			



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SAFETY MEETING DOCUMENTATION FORM

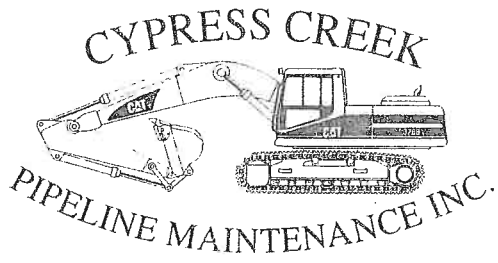
DATE: TUE, 6-18-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
<i>Jim McCall</i>			
<i>Raul Nolasco</i>			
<i>J. DeLoatch Jr.</i>			
<i>Felix Rivera</i>			
<i>Armando Espitia</i>			
<i>JOSE T AGUILAR</i>			
<i>Stephen E. Dandy</i>			
<i>Edwin Schmidt</i>			
<i>Jose Lopez</i>			



Mailing: P.O. Box 3099 • Pearland, TX 77588 Location: 5625 W. Orange St. • Pearland, TX 77581
Phone: (281) 412-2400 • Fax: (281) 412-2727

SAFETY MEETING DOCUMENTATION FORM

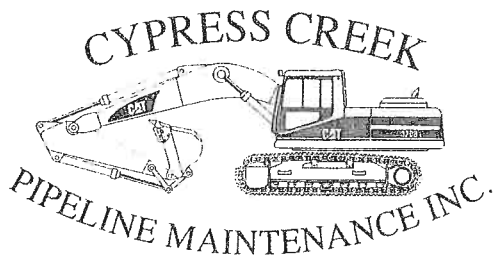
DATE: WED, 6-19-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Inall			
Raeel Viala			
Felix Rivera			
Edwin Schmidt			
Armando Espitia			
JOSE TAGUILERA			
J.E. Weather			
Bob Wills			
Simbo McEl			
Jose Lopez			
Stephen E Jundy			
Hugo Delgado			



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SAFETY MEETING DOCUMENTATION FORM

DATE: THUR, 6-20-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

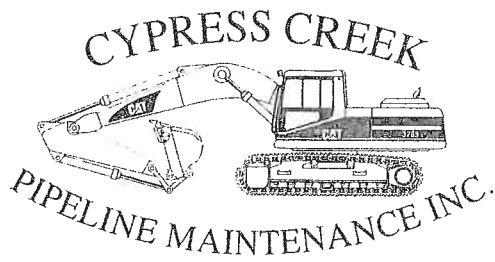
General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Tull			
Raeel Nadeau			
Jimbo MCCA			
Stephen E. Hundy			
Felix Rivera			
Edwin Schmitt			
JOSE T AGUILAR			
Armando Espitia			
HUGO Delgado			
G. L. Weather, J.			
Jose Lopez			
Bob Willis			

(Handwritten scribbles)



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SAFETY MEETING DOCUMENTATION FORM

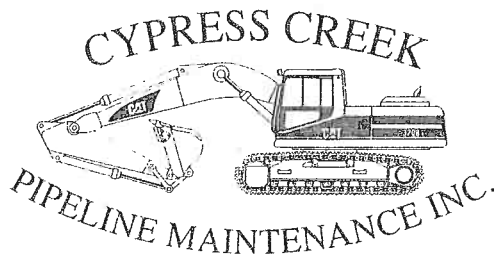
DATE: FRI, 6-21-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Lutz</i>			
<i>Jimbo Mccler</i>			
<i>Bob Wills</i>			
<i>Al Weath</i>			
<i>Raul Nolasco</i>			
<i>Jose Lopez</i>			
<i>Felix Rivera</i>			
<i>JOSÉ T AGUILAR</i>			
<i>Edwin Schmidt</i>			
<i>Stephen E Mundy</i>			
<i>Armando Espitia</i>			
<i>HUGO Delgado</i>			



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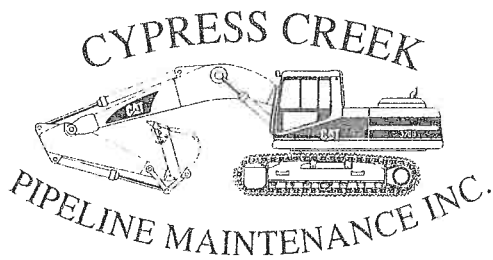
DATE: TUE. 6-25-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Jull</i>			
<i>Jim McCall</i>			
<i>Raoul Vidale</i>			
<i>Armando Espitia</i>			
<i>Stephen E. Hardy</i>			
<i>Jose Lopez</i>			
<i>J. E. Weather</i>			
<i>Eduin Safford</i>			
<i>Felix Rivera</i>			
<i>Bob Wills</i>			
<i>JOSE T AGUILERA</i>			
<i>HUGO Delgado</i>			



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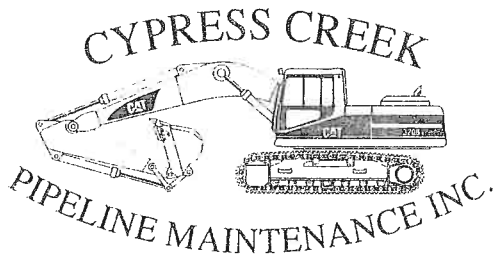
DATE: WED. 6-26-02 LOCATION: ROOSEVELT ROADS TIME: 7:00AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>Bill Inall</i>			
<i>Edwin Schmidt</i>			
<i>Bob Wills</i>			
<i>HUGO Delgado</i>			
<i>Jose Lopez</i>			
<i>Clavel Nichols</i>			
<i>Felix Rivera</i>			
<i>JOSE T Aguilar</i>			
<i>Armando Espitia</i>			
<i>Stephen E Dundy</i>			
<i>Jimbo McCall</i>			
<i>A. Weather, Jr.</i>			



Mailing: P.O. Box 3099 • Pearland, TX 77588 Location: 5625 W. Orange St. • Pearland, TX 77581
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SAFETY MEETING DOCUMENTATION FORM

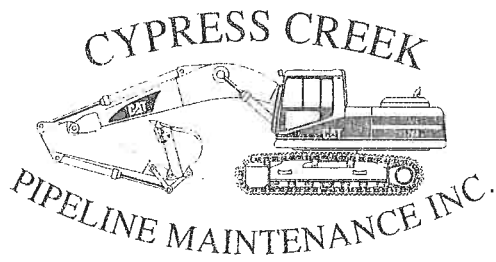
DATE: THUR. 6-27-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

ATTENDANCE

NAME	TITLE	NAME	TITLE
<i>J. Weather, J.</i>			
Jose Lopez			
Armando Espitia			
Israel Nolasco			
Bob Wills			
JOSE TABUILLER			
Felix Rivera			
HUGO Delgado			
Edwin Schmidt			
Stephen [unclear]			
Jim McGeel			
Bill [unclear]			



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Phone: (281) 412-2400 • Fax: (281) 412-2727

SAFETY MEETING DOCUMENTATION FORM

DATE: FRI. 6-28-02 LOCATION: ROOSEVELT ROADS TIME: 7:00 AM

General Topics To Start Meeting

Driving: Seat Belts, Backing Policy	
Personal Safety Gear: Hard Hats, Eye Protection, Gloves, Boots	
Trucks: Inspection & Maintenance	
Equipment: Proper Rigging & Maintenance	
Tools: Good Condition-The Right Tools for the Job	
Fire Extinguisher: On All Trucks	
Take Two: Think Before You Act	

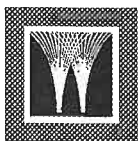
ATTENDANCE

NAME	TITLE	NAME	TITLE
Bill Tull			
A. E. Weather			
Jose Lopez			
Raul Ruelas			
Felix Rivera			
Hugo Delgado			
Armando Espitia			
JOSE T AQUILERA			
Stephen E Fundy			



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

J-20 Incident Reports



INCIDENT REPORT

INCIDENT Hot Electrical wire in VP while working
DATE 18 April 2002
LOCATION NAVSTA Roosevelt Roads VP 25 – Between fuels building and pier
PROJECT NUMBER 7074-18

DESCRIPTION OF WORK TAKING PLACE

Excavation around valve pit and demolition of valve pit concrete walls with hydraulic hammer on a track hoe.

DESCRIPTION OF INCIDENT

While using hammer jack on concrete walls, conduit in VP that was told to be dead, broke. Concrete fell on conduit and wires sparked. Sparks created fire in conduit.

ACTIONS TAKEN/NOTIFICATIONS MADE

After sparks were seen, work was halted, fire then started. A fire extinguisher was retrieved to put out the fire and notification was given to fuels (LT Feliz and Jim Rice) department by Kirsten Glesne that wires in valve pit were live. Fire Department responded to investigate. All personnel were requested to leave from valve pit and electrical circuit was traced out.

FOLLOW-UP ACTION ITEMS

Meeting set with fire department to understand how to prevent in the future.

REPORT FILED BY Kirsten Glesne **Date** 18 April 2002



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

J-21 MSDS for all Hazardous Materials on Site

=====
MSDS Safety Information
=====

MSDS Date: 05/23/2000

MSDS Num: CLCXZ

Product ID: DIESEL FUEL MARINE

MFN: 01,

Responsible Party

Cage: U0434

Name: TOSORO HAWAII CORPORATION

Box: 3379

City: HONOLULU HI 96842

Info Phone Number: 800-547-3941

Emergency Phone Number: (800)424-9300

Chemtrec IND/Phone: (800)424-9300

Review Ind: Y

Published: Y
=====Contractor Summary
=====

Cage: 8P840

Name: HAWAIIAN INDEPENDENT REFINERY, INC.

Address: 733 BISHOP STREET

Box: 3379

City: HONOLULU HI 96842

Phone: 808-547-3111 OR 800-424-9300

Cage: 5W857

Name: TESORO SOUTH PACIFIC RESOURCES INC

Address: 733 BISHOP ST

City: HONOLULU HI 96801

Phone: 000-000-0000

Cage: U0434

Name: TOSORO HAWAII CORPORATION

Box: 3379

City: HONOLULU HI 96842

Phone: 800-547-3941
=====Ingredients
=====

Cas: 8012-95-1

RTECS #: PY8030000

Name: A COMPLEX MIXTURE OF C5 THROUGH C20 HYDROCARBONS (PARAFFINIC, OLEFINIC,
NAPHTHENIC AND AROMATIC) PRODUCED BY THE DISTILLATION OF CRUDE OIL.

Percent by Wt: 100.

OSHA PEL: 5 MG/M3

ACGIH TLV: 5 MG/M3

ACGIH STEL: 10 MG/M3
=====Health Hazards Data
=====

Route Of Entry Inds - Inhalation: YES

Skin: YES

Ingestion: YES

Carcinogenicity Inds - NTP: YES

IARC: NO

OSHA: NO

Effects of Exposure: PROLONGED SKIN CONTACT MAY CAUSE DRYNESS AND DERMATITIS. A
CENTRAL NERVOUS SYSTEM DEPRESSANT. IRRITATING TO EYES AND MUCOUS MEMBRANES.
VAPORS MAY CAUSE PULMONARY IRRITATION, DIZZINESS, OR UNCONSCIOUSNESS,
=====

PARTICULARLY IN ENCLOSED SPACES. CHRONIC EFFECTS: PROLONGED AND REPEATED EXPOSURE MAY CAUSE DERMATITIS.

Explanation Of Carcinogenicity: NTP TESTING FOR CARCINOGENIC POTENTIAL. *OIL MIKST, MINERAL, SUM TOTAL OF 15 POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS) LISTED AS CARCINOGENS BY THE U.S. NATIONAL TOXICOLOGY PROGRAM (NTP).

Signs And Symptions Of Overexposure: INHALATION: RESPIRATORY IRRITATION, DIZZINESS, HEADACHE, DROWSINESS, AND UNCONSCIOUSNESS. SKIN: DRYNESS AND PRIMARY SKIN IRRITANT. EYE: SLIGHT TO MODERATE EYE IRRITATION. INGESTION: ALTHOUGH IT IS NOT A SIGNIFICANT ROUTE OF ENTRY, IF INGESTED, THERE MAY BE STOMACH IRRITATION AND GASTRITIS.

First Aid: INHALATION: MOVE EXPOSED PERSON TO FRESH AIR. RESUSCIATE AND ADMINISTER OXYGEN AS NECESSARY. SEEK MEDICAL ATTENTION. SKIN: REMOVE AFFECTED CLOTHING AND FLUSH AREA WITH SOAP AND RUNNING WATER FOR 15 MI NUTES. EYE: IMMEDIATELY FLUSH WITH LARGE AMOUNT OF RUNNING WATER FOR 20 MINUTES. SEEK IMMEDIATE MEDICAL ATTENTION: INGESTION: DO NOT INDUCE VOMITING, GASTRIC LAVAGE SHOULD BE CONSIDERED BY QUALIFIED M EDICAL PERSONNEL, AVOIDING ASPIRATION INTO LUNGS.

=====
Handling and Disposal
=====

Spill Release Procedures: REMOVE SOURCES OF HEAT OR IGNITION INCLUDING INTERNAL COMBUSTION ENGINES AND POWER TOOLS. CLEAN UP SPILL, BUT DO NT FLUSH TO SEWER OR SURFACE WATER. VENTILATE AREA BEFORE REOCCUPYING.

Waste Disposal Methods: RECLAIM OR RECYCLE IF POSSIBLE, OTHERWISE, COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS FOR DISPOSAL.

Handling And Storage Precautions: STORE AWAY FROM HEAT AND OPEN FLAMES.

=====
Fire and Explosion Hazard Information
=====

Flash Point: =60.C, 140.F

Lower Limits: 6

Upper Limits: 7.2

Extinguishing Media: FOAM, DRY CHEMICAL, AND WATER. WATER FOG CAN BE USED, BUT MAY CAUSE FROTHING. AUTOIGNITION TEMPERATURE: 350-625F.

Fire Fighting Procedures: USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS. USE A SMOTHERING TECHNIQUE FOR EXTINGUISHING FIRE. DO NOT USE A FORCED WATER STREAM DRIECTLY ON OILY FIRES AS THIS WILL SCATTER THE FIRE. FIREFIGHTERS SHOULD WEAR SCBA.

Unusual Fire/Explosion Hazard: HIGHLY FLALMMABLE. WILL BE EASILY IGNITED BY HEAT, SPARKS OR FLAMES. VAPORS MAY FORM EXPLOSIVE MIXTURES WITH AIR. VOPORS MAY TRAVEL TO SOURCE OF IGNITION AND FLASH BACK. VAPOR EXPLOSION HAZARD INDOORS , OUTDOORS OR IN SEWERS. CONTAINERS MAY EXPLODE WHEN HEATED. SUBSTANCE MAY BE TRANSPORTED HOT.

=====
Control Measures
=====

Respiratory Protection: NONE FOR MOST USES. USE NIOSH/MSHA APPROVED ORGANIC VAPOR RESPIRATOR OR SCBA FOR SPILLS AND EMERGENCIES. SCBA FOR CONFIED SPACE ENTRY.

Ventilation: MAINTAIN LOW VAPOR CONCENTRATIONS. MECHANICAL VENTILATION MUST BE EXPLOSION PROOF.

Protective Gloves: IMPERVIOUS

Eye Protection: CHEMICAL SPLASH GOGGLES.

Other Protective Equipment: WEAR IMPERVIOUS CLOTHING.

Supplemental Safety and Health: PRODUCT NAME: DIESEL FUEL MARINE. COMMON NAME(S): DIESEL, F76, DFM, FUEL, NAVY FUEL. CHEMICAL FAMILY: PETROLEUM HYDROCARBON DISTILLATE. CHEMICAL FORMULA: COMPLEX MIXTURE.

=====
Physical/Chemical Properties
=====

HCC: F4
Boiling Point: >190.C, 374.F
B.P. Text: 374-725
Vapor Pres: <0.5
Vapor Density: >1.0
Spec Gravity: 0.841-0.876
PH: NA

Solubility in Water: NEGLIGIBLE
Appearance and Odor: LIGHT YELLOW TO YELLOW BROWN LIQUID. MILD PETROLEUM ODOR.

=====
Reactivity Data
=====

Stability Indicator: YES
Stability Condition To Avoid: HEAT, SPARKS, AND FLAMES.
Materials To Avoid: STRONG OXIDIZING AGENTS, AND BUILD-UP OR STATIC
ELECTRICITY.

Hazardous Decomposition Products: CARBON MONOXIDE, CARBON DIOXIDE, SULFUR
DIOXIDE, REACTIVE HYDROCARBONS.

Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: WILL NOT OCCUR.

=====
Toxicological Information
=====

Toxicological Information: DIESEL FUEL MARINE: SKIN/EYE IRRITATION DATA:
STANDARD DRAIZE TEST: RABBIT-ADMINISTRATION ONTO THE SKIN AT 500 MG/24HR.
MILD REACTION. ACUTE TOXICITY AND OTHER MULTIPLE DOSE TOXICITY DATA: LD50:
RAT-O RAL AT 43 GM/KG. NO TOXIC EFFECTS ARE REPORTED. LD:
MOUSE-ADMINISTRATION ONTO THE SKIN AT >40 GM/KG. NO TOXIC EFFECTS ARE
REPORTED. TDLO: MOUSE-ADMINISTRATION ONTO THE SKIN AT 280 GM/KG/14D-I.
RELATED TO CHRONIC DATA-DEATH. CARCINOGENICITY: A 2-YEAR DERMAL STUDY ON
MARINE DIESEL FUEL, APPLIED TO B6C3F MICE, AT DOSES OF 250 AND 500 MG/KG
INDICATES AN INCREASES OF SQUAMOUS CELL NEOPLASMS OF THE SKIN (PRIMARY
CARCINOMAS).

=====
Ecological Information
=====

Ecological: NOT AVAILABLE.

=====
MSDS Transport Information
=====

Transport Information: DOT CLASSIFICATION: CALSS 3.3. DOT SHIPPING NAME: DIESEL
FUEL MARINE. IDENTIFICATION NUMBER: NA 1993. PACKING GROUP: III. LABEL:
FLAMMABLE LIQUID.

=====
Regulatory Information
=====

Sara Title III Information: SARA TITLE III: SECTION 302 EXTREMELY HAZARDOUS
SUBSTANCES: NOT AVAILABLE. SECTION 311/312 HAZARD CATEGORIES: NOT
AVAILABLE. SECTION 313 TOXIC CHEMICALS: NOT AVAILABLE.

Federal Regulatory Information: OSHA: NOT AVAILABLE. TSCA: NOT AVAILABLE. RCRA:
NOT AVAILABLE.

State Regulatory Information: NOT AVAILABLE.

=====
Other Information
=====

Other Information: NOTE TO PHYSICIAN: ASPIRATION OF THIS PRODUCT DURING EMESIS
MAY RESULT IN SVERE LUNG INJURY. IF EVACUATION OF STOMACH IS NECESSARY, USE
METHOD LEAST LIKELY TO CAUSE ASPIRATION, SUCH AS GASTRIC LAVAGE AFTER
ENDOTRACHAEL INCUBATION. CONTACT A POISON CONTROL CENTER FOR ADDITIONAL
TREATMENT INFORMATION.

=====
Transportation Information
=====

Responsible Party Cage: U0434
Trans ID NO: 157029
Product ID: DIESEL FUEL MARINE
MSDS Prepared Date: 05/23/2000
Review Date: 05/19/2001
MFN: 1
Multiple KIT Number: 0

Review IND: Y
Unit Of Issue: CY
Type Of Container: CYLINDER

=====
Detail DOT Information
=====

DOT PSN Code: EXF
Symbols: D
DOT Proper Shipping Name: DIESEL FUEL
Hazard Class: 3
UN ID Num: NA1993
DOT Packaging Group: III
Label: NONE
Special Provision: B1
Non Bulk Pack: 203
Bulk Pack: 242
Max Qty Pass: 60 L
Max Qty Cargo: 220 L
Vessel Stow Req: A

=====
Detail IMO Information
=====

IMO PSN Code: FOY
IMO Proper Shipping Name: DIESEL FUEL
IMDG Page Number: 3375
UN Number: 1202
UN Hazard Class: 3.3
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 3-07
MED First Aid Guide NUM: 311

=====
Detail IATA Information
=====

IATA PSN Code: JEV
IATA UN ID Num: 1202
IATA Proper Shipping Name: DIESEL FUEL
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
UN Packing Group: III
Packing Note Passenger: 309
Max Quant Pass: 60L
Max Quant Cargo: 220L
Packaging Note Cargo: 310
Exceptions: A3

=====
Detail AFI Information
=====

AFI PSN Code: JEV
AFI Proper Shipping Name: DIESEL FUEL

AFI PSN Modifier: ,ALSO SEE GAS OIL

AFI Hazard Class: 3

AFI UN ID NUM: UN1202

AFI Packing Group: III

Special Provisions: P5

Back Pack Reference: A7.3

=====
HAZCOM Label
=====

Product ID: DIESEL FUEL MARINE

Cage: U0434

Assigned IND: Y

Company Name: TOSORO HAWAII CORPORATION

PO Box: 3379

City: HONOLULU HI

Zipcode: 96842

Health Emergency Phone: (800)424-9300

Label Required IND: Y

Date Of Label Review: 05/19/2001

Status Code: A

Origination Code: F

Chronic Hazard IND: Y

Eye Protection IND: YES

Skin Protection IND: YES

Signal Word: WARNING

Respiratory Protection IND: NO

Health Hazard: Moderate

Contact Hazard: Slight

Fire Hazard: Moderate

Reactivity Hazard: None

Hazard And Precautions: PROLONGED SKIN CONTACT MAY CAUSE DRYNESS AND
DERMATITIS. A CENTRAL NERVOUS SYSTEM DEPRESSANT. IRRITATING TO EYES AND
MUCOUS MEMBRANES. VAPORS MAY CAUSE PULMONARY IRRITATION, DIZZINESS, OR
UNCONSCIOUSNESS, PARTICULARLY IN ENCLOSED SPACES.

=====
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utilizing this instruction who is not a military or civilian employee of the
United States of America should seek competent professional advice to verify
and assume responsibility for the suitability of this information to their
particular situation regardless of similarity to a corresponding Department
of Defense or other government situation.

=====
MSDS Safety Information
=====

FSC: 9130
NIIN: 00-273-2379
MSDS Date: 04/24/1992
MSDS Num: BPFTZ
Product ID: MILITARY AVIATION TURBINE FUEL JP-5
MFN: 02
Responsible Party
Cage: 9V333
Name: ARCO PRODUCTS CO DIV OF ATLANTIC RICHFIELD CO
Address: 1055 W 7TH ST
City: LOS ANGELES CA 90017-2503
Info Phone Number: 800-322-2726
Emergency Phone Number: 800-424-9300 (CHEMTREC)
Review Ind: Y
Published: Y

=====
Contractor Summary
=====

Cage: 9V333
Name: ARCO PRODUCTS CO DIV OF ATLANTIC RICHFIELD CO
Address: 333 S HOPE ST
Box: 512570
City: LOS ANGELES CA 90071-0570
Phone: 213-486-0773/800-322-2726 INFO

=====
Item Description Information
=====

Item Name: TURBINE FUEL, AVIATION
Specification Number: MIL-T-5624
Type/Grade/Class: GRADE JP-5
Unit of Issue: GL
UI Container Qty: X
Type of Container: BULK

=====
Ingredients
=====

Cas: 25551-13-7
RTECS #: DC3220000
Name: TRIMETHYL BENZENE (SARA III)
% Wt: 1-2
Other REC Limits: NONE RECOMMENDED
OSHA PEL: 25 PPM
ACGIH TLV: 25 PPM; 9293

Name: HYDROCARBON MIXTURE BOILING RANGE 291-572F
% Wt: >98
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

=====
Health Hazards Data
=====

LD50 LC50 Mixture: LD50 (ORAL RAT) IS UNKNOWN
Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: NO

=====
Safety Information
=====

SC: 8010
NIIN: 00-290-7288
MSDS Date: 12/01/1992
MSDS Num: BYNYG
Product ID: TT-P-38E ALUMINUM PAINT, READY MIXED
MFN: 01
Responsible Party
Cage: 6F266
Name: FARWEST PAINT MFG CO
Address: 4522 S 133 ST
Box: 68726
City: TUKWILA WA 98168-3251
Info Phone Number: 206-941-1619/206-244-8844
Emergency Phone Number: 206-941-1619/206-244-8844
Preparer's Name: NORMA HABEEB
Review Ind: Y
Published: Y

=====
Preparer Co. when other than Responsible Party Co.
=====

Cage: 6F266
Name: FARWEST PAINT MANUFACTURING CO
Address: 4522 SOUTH 133RD ST
City: TUKWILA WA 98168

=====
Contractor Summary
=====

Cage: 6F266
Name: FARWEST PAINT MANUFACTURING CO
Address: 4522 SOUTH 133RD ST
City: TUKWILA WA 98168
Phone: 206-244-8844

=====
Item Description Information
=====

Item Manager: GSA
Item Name: PAINT,OIL
Unit of Issue: QT
UI Container Qty: B

=====
Ingredients
=====

Cas: 64742-47-8
RTECS #: OA5504000
Name: KEROSENE (PETROLEUM), HYDROTREATED (C10-C15 SATURATED HYDROCARBONS 97%,
C10 AROMATICS 3%) *95-3*
% Wt: 29.17
Other REC Limits: 200 PPM EXXON
OSHA PEL: 200 PPM
ACGIH TLV: 100 PPM

Cas: 138-86-3
RTECS #: OS8100000
Name: DIPENTENE, P-METHA-1,8-DIENE
% Wt: 3.65
ACGIH TLV: 100 PPM

Cas: 8032-32-4
RTECS #: OI6180000
Name: V M & P NAPHTHA, LIGROINE, MINERAL SPIRITS
% Wt: 8
Other REC Limits: STEL 400 PPM
OSHA PEL: 100 PPM
ACGIH TLV: 100 PPM

Cas: 7429-90-5
RTECS #: BD0330000
Name: ALUMINUM (POWDER) *95-3*
% Wt: 13.82
OSHA PEL: 5 MG/CUM
ACGIH TLV: 5 MG/CUM (DUST)

RTECS #: 9999999VO
Name: VOLATILE ORGANIC CONTENT: 416 GM/L (LESS WATER)
=====

Health Hazards Data
=====

Route Of Entry Inds - Inhalation: YES

Skin: YES

Ingestion: YES

Carcinogenicity Inds - NTP: NO

IARC: NO

OSHA: NO

Effects of Exposure: SKIN: MAY CAUSE IRRITATION & SENSITIZATION.

INHALATION: REPEATED/PROLONGED OVEREXPOSURE TO SOLVENTS MAY CAUSE PERMANENT
BRAIN & NERVOUS SYSTEM DAMAGE. EYES: MAY CAUSE IRRITATION.

Explanation Of Carcinogenicity: NONE

Signs And Symptions Of Overexposure: IRRITATION, DEFATTING, HEADACHE,
DIZZINESS, NAUSEA & LOSS OF CONSCIOUSNESS.

Medical Cond Aggravated By Exposure: NONE

First Aid: SKIN: PROMPTLY WASH W/SOAP & WATER. EYES: FLUSH W/LARGE

QUANTITIES OF WATER FOR 15 MINS. INGESTION: DON'T INDUCE VOMITING. KEEP WARM
& QUIET. ASPIRATION HAZARD. INHALATION: REMOVE TO FRESH AIR. OBTAIN
MEDICAL ATTENTION IN ALL CASES.

=====
Handling and Disposal
=====

Spill Release Procedures: REMOVE IGNITION SOURCES. VENTILATE AREA. ABSORB
W/SAWDUST, VERMICULITE/SAND & PLACE MATERIAL INTO A CLOSED CONTAINER.
LARGE: DIKE TO PREVENT MATERIAL FROM ENTERING WATER SYSTEMS/SEWERS. WEAR
PROTECTIV E EQUIPMENT DURING CLEANUP.

Waste Disposal Methods: DISPOSE OF MATERIAL/CONTAINER IAW/FEDERAL, STATE &
LOCAL REGULATIONS. IF DISCARDED, THIS MATERIAL & CONTAINERS SHOULD BE
TREATED AS HAZARDOUS WASTE BASED ON CHARECTERISTIC OF IGNITABILITY.
COMBUSTIBLE UN1263.

Handling And Storage Precautions: KEEP AWAY FROM HEAT/OPEN FLAME. DON'T WELD ON
FULL/EMPTY CONTAINERS. KEEP CONTAINERS CLOSED WHEN NOT IN USE & PROPERLY
LABELED.

Other Precautions: KEEP OUT OF REACH OF CHILDREN. AVOID PROLONGED/REPEATED
INHALATION OF HEATED VAPORS/SPRAY MISTS. DON'T GET IN EYES, ON SKIN/CLOTHING.
DON'T ALLOW CONTAMINATED CLOTHING TO CONTACT SKIN.

=====
Fire and Explosion Hazard Information
=====

Flash Point Method: TCC

Flash Point Text: 107F

Lower Limits: 0.7

Upper Limits: 6

Extinguishing Media: FOAM, CO2, DRY CHEMICAL.

Fire Fighting Procedures: WEAR A SCBA & PROTECTIVE CLOTHING. EVACUATE AREA.
WATER IS UNSUITABLE AS AN EXTINGUISHING MEDIUM BUT MAY BE USED IN KEEPING
ADJACENT CONTAINERS COOL.

Unusual Fire/Explosion Hazard: VAPORS MAY FORM AN EXPLOSIVE MIXTURE IN AIR
& MAY BE IGNITED BY AN IGNITION SOURCE. CLOSED CONTAINERS MAY RUPTURE
WHEN EXPOSED TO EXTREME HEAT. (SEE SUPP)

=====
Control Measures
=====

Respiratory Protection: WEAR A CANISTER TYPE RESPIRATOR WHEN VAPORS/SPRAY MISTS
EXCEED TLVS/PELS.

Ventilation: GENERAL: NORMAL USE. LOCAL EXHAUST: MAY BE REQUIRED TO KEEP
EXPOSURE LEVEL <ACCEPTABLE LIMITS DURING CERTAIN OPERATIONS.

Protective Gloves: NITRILE/NEOPRENE/RUBBER

Eye Protection: FACE SHIELD/CHEMICAL GOGGLES

Other Protective Equipment: PROTECTIVE CLOTHING, EYE WASH STATION & SAFETY
SHOWER

Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.
WASH AFTER HANDLING.

Supplemental Safety and Health: FIRE HAZARDS CONT'D: CONTAINERS CONTAMINATED
W/WATER MAY BECOME EXPLOSIVE DUE TO FORMATION OF HYDROGEN GAS FROM ALUMINUM
& WATER REACTING.

=====
Physical/Chemical Properties
=====

B. P. Text: 307-387F

Vapor Pres: 2.6

Vapor Density: >1

Evaporation Rate & Reference: SLOWER THAN ETHER

Solubility in Water: INSOLUBLE

Appearance and Odor: SILVERY THIN LIQUID W/MILD ODOR

Percent Volatiles by Volume: 52.7
=====

Reactivity Data
=====

Stability Indicator: YES

Stability Condition To Avoid: MOISTURE, HEAT, SPARKS, OPEN FLAME & OTHER
IGNITION SOURCES.

Materials To Avoid: WATER, STRONG OXIDANTS, ACIDS, BASES & EPOXY HARDENERS
UNCONTROLLED CONDITIONS.

Hazardous Decomposition Products: INCOMPLETE COMBUSTION: CO & TOXIC VAPORS.
MOISTURE CONTACT W/ALUMINUM WILL GENERATE HYDROGEN GAS.

Hazardous Polymerization Indicator: NO
=====

Toxicological Information
=====

Ecological Information
=====

MSDS Transport Information
=====

Regulatory Information
=====

Other Information

=====
=====
HAZCOM Label
=====

Product ID: TT-P-38E ALUMINUM PAINT, READY MIXED
Cage: 6F266
Company Name: FARWEST PAINT MANUFACTURING CO
Street: 4522 SOUTH 133RD ST
City: TUKWILA WA
Zipcode: 98168
Health Emergency Phone: 206-941-1619/206-244-8844
Label Required IND: Y
Date Of Label Review: 12/16/1998
Status Code: C
Label Date: 12/16/1998
Origination Code: G

Hazard And Precautions: SKIN: MAY CAUSE IRRITATION & SENSITIZATION.

INHALATION: REPEATED/PROLONGED OVEREXPOSURE TO SOLVENTS MAY CAUSE PERMANENT
BRAIN & NERVOUS SYSTEM DAMAGE. EYES: MAY CAUSE IRRITATION.

IRRITATION,
DEFATTING, HEADACHE, DIZZINESS, NAUSEA & LOSS OF CONSCIOUSNESS.

=====
Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever expressly or implied warrants, states, or intends said information to have any application, use or viability by or to any person or persons outside the Department of Defense nor any person or persons contracting with any instrumentality of the United States of America and disclaims all liability for such use. Any person utilizing this instruction who is not a military or civilian employee of the United States of America should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation regardless of similarity to a corresponding Department of Defense or other government situation.

HAZARDS IDENTIFICATION**(ANSI Section 3)**

Primary route(s) of exposure : Inhalation, skin contact, eye contact, ingestion.

Effects of overexposure :

Inhalation : Irritation of respiratory tract. Prolonged inhalation may lead to mucous membrane irritation, fatigue, drowsiness, dizziness and/or lightheadedness, headache, uncoordination, nausea, vomiting, diarrhea, abdominal pain, chest pain, blurred vision, coughing, difficulty with speech, apathy, central nervous system depression, intoxication, metallic taste, anesthetic effect or narcosis, difficulty of breathing, allergic response, bronchitis, fever and chills, dehydration, tremors, liver damage, kidney damage, pulmonary edema, loss of consciousness, respiratory failure, asphyxiation, death. Possible sensitization to respiratory tract.

Skin contact : Irritation of skin. Prolonged or repeated contact can cause dermatitis, defatting, blistering, allergic response, severe skin irritation, severe skin irritation or burns. Possible sensitization to skin.

Eye contact : Irritation of eyes. Prolonged or repeated contact can cause conjunctivitis, blurred vision, tearing of eyes, redness of eyes, severe eye irritation, severe eye irritation or burns, corneal injury.

Ingestion : Ingestion may cause lung inflammation and damage due to aspiration of material into lungs, mouth and throat irritation, mucous membrane irritation, drowsiness, dizziness and/or lightheadedness, headache, uncoordination, nausea, vomiting, diarrhea, gastro-intestinal disturbances, severe abdominal pain, abdominal pain, visual disturbances, apathy, central nervous system depression, anesthetic effect or narcosis, difficulty of breathing, burns of the mouth, throat, stomach, liver damage, kidney damage, pulmonary edema, convulsions, loss of consciousness, respiratory failure, death.

Medical conditions aggravated by exposure : Eye, skin, respiratory disorders asthma-like conditions respiratory disorders

FIRST-AID MEASURES**(ANSI Section 4)**

Inhalation : Remove to fresh air. Restore and support continued breathing. Get emergency medical attention. Have trained person give oxygen if necessary. Get medical help for any breathing difficulty. Remove to fresh air if inhalation causes eye watering, headaches, dizziness, or other discomfort.

Skin contact : Wash thoroughly with soap and water. If any product remains, gently rub petroleum jelly, vegetable or mineral/baby oil onto skin. Repeated applications may be needed. Remove contaminated clothing. Wash contaminated clothing before re-use. Dispose of contaminated leather items, such as shoes and belts. If irritation occurs, consult a physician.

Eye contact : Flush immediately with large amounts of water, especially under lids for at least 15 minutes. If irritation or other effects persist, obtain medical treatment.

Ingestion : If swallowed, obtain medical treatment immediately.

FIRE-FIGHTING MEASURES**(ANSI Section 5)**

Fire extinguishing media : Dry chemical or foam water fog. Carbon dioxide. Closed containers may explode when exposed to extreme heat or fire. Vapors are heavier than air and may travel long distances to a source of ignition and flash back. Vapors can form explosive mixtures in air at elevated temperatures. Closed containers may burst if exposed to extreme heat or fire. May decompose under fire conditions emitting irritant and/or toxic gases.

Fire fighting procedures : Water may be used to cool and protect exposed containers. Firefighters should use full protective clothing, eye protection, and self-contained breathing apparatus. Self-contained breathing apparatus recommended.

Hazardous decomposition or combustion products : Carbon monoxide, carbon dioxide, oxides of nitrogen, acrid fumes, aldehydes, toxic gases, toluene diisocyanate, smoke and soot, unidentified organic compounds.

ACCIDENTAL RELEASE MEASURES**(ANSI Section 6)**

Steps to be taken in case material is released or spilled : Comply with all applicable health and environmental regulations. Eliminate all sources of ignition. Ventilate area. Spills may be collected with absorbent materials. Use non-sparking tools. Evacuate all unnecessary personnel. Place collected material in proper container. Wet down spilled material with water. Complete personal protective equipment must be used during cleanup. Large spills - shut off leak if safe to do so. Dike and contain spill. Pump to storage or salvage vessels. Use absorbent to pick up excess residue. Keep salvageable material and rinse water out of sewers and water courses. Small spills - use absorbent to pick up residue and dispose of properly.

HANDLING AND STORAGE**(ANSI Section 7)**

Handling and storage : Store below 100f (38c). Keep away from heat, sparks and open flame. Keep away from direct sunlight, heat and all sources of ignition. Keep container tightly closed in a well-ventilated area.

Other precautions : Use only with adequate ventilation. Do not take internally. Keep out of reach of children. Avoid contact with skin and eyes, and breathing of vapors. Wash hands thoroughly after handling, especially before eating or smoking. Keep containers tightly closed and upright when not in use. Avoid conditions which result in formation of inhalable particles such as spraying or abrading (sanding) painted surfaces. If such conditions cannot be avoided, use appropriate respiratory protection as directed under exposure controls/personal protection. Empty containers may contain hazardous residues. Ground equipment when transferring to prevent accumulation of static charge.

EXPOSURE CONTROLS/PERSONAL PROTECTION**(ANSI Section 8)**

Respiratory protection : Control environmental concentrations below applicable exposure standards when using this material. When respiratory protection is determined to be necessary, use a NIOSH/MSHA (Canadian z94.4) Approved elastomeric sealing- surface facepiece respirator outfitted with organic vapor cartridges and paint spray (dust/mist) prefilters. Determine the proper level of protection by conducting appropriate air monitoring. Consult 29CFR1910.134 For selection of respirators (Canadian z94.4).

Ventilation : Provide dilution ventilation or local exhaust to prevent build-up of vapors. Use explosion-proof equipment.

Personal protective equipment : Eye wash, safety shower, safety glasses or goggles. Impervious gloves, impervious clothing, face shield, apron.

STABILITY AND REACTIVITY**(ANSI Section 10)**

Under normal conditions : Stable see section 5 fire fighting measures

Materials to avoid : Oxidizers, acids, reducing agents, bases, aldehydes, halogens, amines, aluminum, epoxides, nitric acid, combustible materials, magnesium, lewis acids, mineral acids. Nitrates.

Conditions to avoid : Elevated temperatures, contact with oxidizing agent, storage near acids, sparks, open flame, ignition sources.

Hazardous polymerization : Will not occur may polymerize in presence of aliphatic amines.

The information contained herein is based on data available at the time of preparation of this data sheet which ICI Paints believes to be reliable. However, no warranty is expressed or implied regarding the accuracy of this data. ICI Paints shall not be responsible for the use of this information, or of any product, method or apparatus mentioned and you must make your own determination of its suitability and completeness for your own use, for the protection of the environment, and the health and safety of your employees and the users of this material. Complies with OSHA hazard communication standard 29CFR1910.1200.

TOXICOLOGICAL INFORMATION (ANSI Section 11)

Supplemental information : Contains a chemical that is moderately toxic by ingestion. Contains a chemical that is toxic by ingestion. Contains a chemical that is toxic by dermal absorption. Contains a chemical that is toxic by inhalation. Contains a chemical that is readily absorbed through skin. Excessive inhalation of fumes may lead to metal fume fever characterized by a metallic taste in mouth, excessive thirst, coughing, weakness, fatigue, muscular pain, nausea, chills and fever. Notice - reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Prolonged inhalation of mica may cause pneumoconiosis. Symptoms may include a progressive dry cough, shortness of breath on exertion, decreased chest expansion, weakness and weight loss. Other effects of overexposure may include toxicity to liver, kidney, lungs, central nervous system, blood.

Carcinogenicity : This product contains a polymeric blocked isocyanate based on toluene diisocyanate (tdi). Free tdi may be released at elevated temperatures during baking. Tdi is highly toxic by inhalation, a severe eye, skin and mucous membrane irritant, and a pulmonary and skin sensitizer. Tdi is classified as a possible human carcinogen by IARC (group 2b) and as a reasonably anticipated carcinogen by NTP. The OSHA and acgih exposure limit is 0.005 Ppm (twa) and 0.02 Ppm (stel). Inhalation of non-asbestiform cosmetic grade talc for 2 years at 6 and 18 mg/m3 produced clear evidence of carcinogenicity in female rats (lung and adrenal tumors) and some evidence of carcinogenicity in male rats (adrenal tumors). No evidence of carcinogenicity was demonstrated in male and female mice exposed under the same conditions. Microscopic examination of the lungs of rats and mice exposed to talc revealed additional exposure related effects primarily associated with the inflammatory response. Contains crystalline silica which is considered a hazard by inhalation. IARC has classified crystalline silica as carcinogenic to humans (group 1). Crystalline silica is also a known cause of silicosis, a noncancerous lung disease. The national toxicology program (NTP) has classified crystalline silica as a known human carcinogen. Notice - toluene diisocyanate (tdi) has been reported to be a carcinogen by the national toxicology program (NTP). The international agency for research on cancer (IARC) concluded, based on the NTP study, that there is "sufficient evidence for carcinogenicity of tdi to experimental animals", but "inadequate evidence for carcinogenicity of tdi to humans." The international agency for research on cancer (IARC) has classified carbon black as possibly carcinogenic to humans (group 2b) based on sufficient evidence in animals and inadequate evidence in humans.

Physical Data (ANSI Sections 1, 9, and 14)

Product Code	Description	Wt. / Gal.	VOC gr. / ltr.	% Volatile by Volume	Flash Point	Boiling Range	HMIS	DOT, proper shipping name
235B1642	bar-rust 235 multi-purpose epoxy coating - buff base	11.79	285.45	33.81	100 f	243-355	*320	paint, combustible liquid, UN 1263, PGIII
235B2531	barrust 235 multi-purpose epoxy coating - im gray base	11.86	289.05	34.21	100 f	243-355	*220	paint, combustible liquid, UN 1263, PGIII
235B2534	bar-rust 235 multi-purpose epoxy coating - medium gray base	11.74	285.33	33.80	100 f	243-355	*220	paint, combustible liquid, UN 1263, PGIII
235B2904	bar-rust 235 multi-purpose epoxy coating - haze gray base	11.68	284.13	33.63	100 f	243-355	*220	paint, combustible liquid, UN 1263, PGIII
235B2973	bar-rust 235 multi-purpose epoxy coating - new gray base	11.73	284.61	33.69	100 f	243-355	*220	paint, combustible liquid, UN 1263, PGIII
235B3501	bar-rust 235 multi-purpose epoxy coating - white base	11.89	287.85	34.09	100 f	243-355	*220	paint, combustible liquid, UN 1263, PGIII
235B7821	bar-rust 235 multi-purpose epoxy coating - oxide red base	11.82	286.29	33.90	100 f	243-355	*220	paint, combustible liquid, UN 1263, PGIII
235B9500	bar-rust 235 multi-purpose epoxy coating white e tint base	12.10	290.01	34.36	100 f	243-355	*220	paint, combustible liquid, UN 1263, PGIII
235B9501	bar-rust 235 multi-purpose epoxy coating deep p tint base	11.65	288.81	34.21	100 f	243-355	*320	paint, combustible liquid, UN 1263, PGIII
235B9502	bar-rust 235 multi-purpose epoxy coating new tra tint base	10.65	297.08	35.14	100 f	243-355	*220	paint, combustible liquid, UN 1263, PGIII
235B9903	bar-rust 235 multi-purpose epoxy coating - black base	11.61	281.14	33.30	100 f	243-355	*220	paint, combustible liquid, UN 1263, PGIII
235C0910	bar-rust 235 multi-purpose epoxy coating - converter for monopak colors	7.98	335.29	36.50	100 f	n/d	320	paint, combustible liquid, UN 1263, PGIII
235C0980	barrust 235 multi-purpose epoxy coating converter	7.90	331.11	38.40	100 f	243-355	320	paint, combustible liquid, UN 1263, PGIII

Ingredients

Product Codes with % by Weight (ANSI Section 2)

Chemical Name	Common Name	CAS. No.	235B1642	235B2531	235B2534	235B2904	235B2973	235B3501	235B7821	235B9500	235B9501	235B9502	235B9903	235C0910	235C0980
1,2-ethanediamine	ethylenediamine	107-15-3													
1,3,5-trimethylbenzene	1,3,5-trimethylbenzene	108-67-8	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
2-heptanone	methyl amyl ketone	110-43-0	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
mica	mica	12001-28-2	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
antigorite	antigorite	12135-86-3	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5

Reproductive effects : High exposures to xylene in some animal studies, often at maternal levels, have affected embryo/fetal development. The significance of this finding to humans is unknown.

Mutagenicity : No mutagenic effects are anticipated

Teratogenicity : No teratogenic effects are anticipated

ECOLOGICAL INFORMATION (ANSI Section 12)

No ecological testing has been done by ICI paints on this product as a whole.

DISPOSAL CONSIDERATIONS (ANSI Section 13)

Waste disposal : Dispose in accordance with all applicable regulations. Avoid discharge to natural waters.

REGULATORY INFORMATION (ANSI Section 15)

As of the date of this MSDS, all of the components in this product are listed (or are otherwise exempt from listing) on the TSCA inventory. This product contains 10% or greater of a chemical classified by DOT as a marine pollutant (see Chemical Hazard Data table). This product has been classified in accordance with the hazard criteria of the CFR (controlled products regulations) and the MSDS contains all the information required by the CFR.

Ingredient (Continued)

Product Codes with % by Weight (ANSI Section 2)

Chemical Name	CAS No.	235B1642	235B2531	235B2534	235B2534	235B2973	235B3501	235B7821	235B9500	235B9501	235B9502	235B9903	235B0910	235C0980
iron oxide	1309-37-1	1-5	1-5	1-5	1-5	1-5	1-5	5-10	1-5	1-5	1-5			
benzene, dimethyl-	1330-20-7	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5			1-1.0
carbon black	1333-86-4				1-1.0						1-5			
titanium dioxide	13463-67-7	1-5	10-20	5-10	1-5	5-10	10-20	10-20	10-20	5-10				
tremolite, nonasbestiform	14567-73-8	10-20	5-10	10-20	10-20	10-20	5-10	10-20	5-10	5-10	10-20			
talca	14807-96-6	10-20	5-10	10-20	10-20	10-20	5-10	10-20	5-10	5-10	10-20			
quartz	14808-60-7	1-1.0	1-1.0					1-1.0			1-1.0			
oxirane, 2,2'-((1-methylethylene)bis(4,1-phenyleneoxy)methylene))bis-	1675-54-3	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5			
anthophyllite, nonasbestiform	17068-78-9	1-1.0	1-1.0	1-1.0	1-1.0	1-1.0	1-1.0	1-1.0	1-1.0	1-1.0	1-1.0			
aluminum hydroxide	21645-51-2	1-5	1-5						1-5		1-5			
phenol, 4,4'-((1-methylethylene)bis(4,1-phenyleneoxy)methylene))bis(oxirane)	25036-25-3	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5			
epoxy resin	25085-99-8	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	20-30			
homopolymer	51274-00-1	1-5												
c.i. pigment yellow 42	64742-95-6	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5			10-20
solvent naphtha (petroleum), light aromatic	68410-16-2	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20			
aromatic distillates (petroleum), steam-cracked, polymers with light steam-cracked petroleum naphtha	68413-28-5													60-70
nutshell liquid, polymer with ethylenediamine and formaldehyde	71-36-3	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10	5-10			5-10
1-butanol	7631-86-9	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5			
amorphous silica	95-63-6	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5			10-20
benzene, 1,2,4-trimethyl-	Sup. Conf.	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5			
castor oil derivative	Sup. Conf.	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5			
alkyl phenol blocked polyisocyanate	Sup. Conf.	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5			

Chemical Hazard Data

(ANSI Sections 2, 8, 11, and 15)

Common Name	CAS. No.	ACGIH-TLV				OSHA-PEL				S.R. Std.								
		8-Hour TWA	STEL	C	S	8-Hour TWA	STEL	C	S	S2	S3	CC	H	M	N	I	O	
ethylenediamine	107-15-3	10 ppm	not est.	not est.	not est.	10 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
1,3,5-trimethylbenzene	108-67-8	25 ppm	35 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
methyl amyl ketone	110-43-0	50 ppm	not est.	not est.	not est.	100 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
mica	12001-26-2	3 mg/m3	not est.	not est.	not est.	3 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
antigorite	12135-86-3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
ferric oxide	1309-37-1	5 mg/m3	not est.	not est.	not est.	10 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
xylylene	1330-20-7	100 ppm	150 ppm	not est.	not est.	100 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
carbon black	1333-86-4	3.5 mg/m3	not est.	not est.	not est.	3.5 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
titanium dioxide	13463-67-7	10 mg/m3	not est.	not est.	not est.	10 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
tremolite	14567-73-8	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
talca	14807-96-6	2 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
quartz	14808-60-7	.05 mg/m3	not est.	not est.	not est.	0.1 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.
diglycidyl ether of bisphenol a	1675-54-3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.

Footnotes:
 S=Skin - Additional exposure, over and above airborne exposure, may result from skin absorption.
 C=Ceiling - Concentration that should not be exceeded, even instantaneously.

n/a=not applicable
 ppm=parts per million
 mg/m3=milligrams per cubic meter
 Sup Conf=Supplier Confidential

S2=Sara Section 302 EHS
 S3=Sara Section 313 Chemical
 S.R.Std.=Supplier Recommended Standard

H=Hazardous Air Pollutant, M=Marine Pollutant
 P=Pollutant, S=Severe Pollutant
 Carcinogenicity Listed By:
 N=NTP, I=ARC, O=OSHA, y=yes, n=no

Chemical Hazard Data (Continued) (ANSI Sections 2, 8, 11, and 15)

Common Name	CAS. No.	ACGIH-TLV			OSHA-PEL			S.R. Std.	S2	S3	CC	H	M	N	I	O
		8-Hour TWA	STEL	C	S	8-Hour TWA	STEL									
anthophyllite	17068-78-9	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
aluminum hydroxide	21645-51-2	10 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
epoxy resin	25036-25-3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
epoxy resin	25085-99-8	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
yellow iron oxide	51274-00-1	5 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
light aromatic solvent naphtha	64742-95-6	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
aromatic hydrocarbon resin	68410-16-2	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
alkylated phenolic polyamine	68413-28-5	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
n-butanol	71-36-3	20 ppm	not est.	not est.	not est.	not est.	not est.	not est.	n	y	n	n	n	n	n	n
amorphous silica	7631-86-9	10 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
pseudocumene	95-63-6	25 ppm	not est.	not est.	not est.	not est.	not est.	not est.	n	y	n	n	n	n	n	n
rheological additive	Sup. Conf.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n
alkyl phenol blocked polyisocyanate	Sup. Conf.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n	n	n

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 S=Skin - Additional exposure, over and above airborne exposure, may result from skin absorption.
 n/a=not applicable
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 CC=CERCLA Chemical
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 Carcinogenicity Listed By:
 N=NTP, I=ARC, O=OSHA, y=yes, n=no

HAZARDS IDENTIFICATION

(ANSI Section 3)

Primary route(s) of exposure : Inhalation, skin contact, eye contact, ingestion.**Effects of overexposure :**

Inhalation : Irritation of respiratory tract. Prolonged inhalation may lead to mucous membrane irritation, fatigue, drowsiness, dizziness and/or lightheadedness, headache, uncoordination, nausea, vomiting, coughing, apathy, central nervous system depression, intoxication, anesthetic effect or narcosis, difficulty of breathing, allergic response, tremors, liver damage, kidney damage, pulmonary edema, pneumoconiosis, loss of consciousness, death. Possible sensitization to respiratory tract.

Skin contact : Irritation of skin. Prolonged or repeated contact can cause dermatitis, defatting, allergic response, severe skin irritation. Possible sensitization to skin. Skin contact may result in dermal absorption of component(s) of this product which may cause drowsiness, dizziness and/or lightheadedness, central nervous system depression.

Eye contact : Irritation of eyes. Prolonged or repeated contact can cause conjunctivitis, tearing of eyes, redness of eyes, severe eye irritation, corneal injury.

Ingestion : Ingestion may cause lung inflammation and damage due to aspiration of material into lungs, mouth and throat irritation, drowsiness, dizziness and/or lightheadedness, headache, nausea, vomiting, diarrhea, gastro-intestinal disturbances, abdominal pain, apathy, central nervous system depression, intoxication, anesthetic effect or narcosis, pulmonary edema, convulsions, loss of consciousness.

Medical conditions aggravated by exposure : Eye, skin, respiratory disorders asthma-like conditions kidney disorders liver disorders nervous system disorders respiratory disorders

FIRST-AID MEASURES

(ANSI Section 4)

Inhalation : Remove to fresh air. Restore and support continued breathing. Get emergency medical attention. Have trained person give oxygen if necessary. Get medical help for any breathing difficulty. Remove to fresh air if inhalation causes eye watering, headaches, dizziness, or other discomfort. Get medical attention if discomfort or irritation persists.

Skin contact : Wash thoroughly with soap and water. If any product remains, gently rub petroleum jelly, vegetable or mineral/baby oil onto skin. Repeated applications may be needed. Remove contaminated clothing. Wash contaminated clothing before re-use. If irritation occurs, consult a physician.

Eye contact : Flush immediately with large amounts of water, especially under lids for at least 15 minutes. If irritation or other effects persist, obtain medical treatment.

Ingestion : If swallowed, obtain medical treatment immediately.

FIRE-FIGHTING MEASURES

(ANSI Section 5)

Fire extinguishing media : Dry chemical or foam water fog. Carbon dioxide. Closed containers may explode when exposed to extreme heat or fire. Vapors may ignite explosively at ambient temperatures. Vapors are heavier than air and may travel long distances to a source of ignition and flash back. Vapors can form explosive mixtures in air at elevated temperatures. Closed containers may burst if exposed to extreme heat or fire. Dust explosion hazard. May decompose under fire conditions emitting irritant and/or toxic gases.

Fire fighting procedures : Water may be used to cool and protect exposed containers. Firefighters should use full protective clothing, eye protection, and self-contained breathing apparatus.

Hazardous decomposition or combustion products : Carbon monoxide, carbon dioxide, oxides of nitrogen, acrid fumes, oxides of sulfur, hydrogen chloride, toxic gases, barium compounds, monoazo compounds, aromatic amines, 3,3' dichlorobenzidine.

ACCIDENTAL RELEASE MEASURES

(ANSI Section 6)

Steps to be taken in case material is released or spilled : Comply with all applicable health and environmental regulations. Eliminate all sources of ignition. Ventilate area with explosion-proof equipment. Spills may be collected with absorbent materials. Use non-sparking tools. Evacuate all unnecessary personnel. Place collected material in proper container. Complete personal protective equipment must be used during cleanup. Vacuum with grounded equipment. Large spills - shut off leak if safe to do so. Dike and contain spill. Pump to storage or salvage vessels. Use absorbent to pick up excess residue. Keep salvageable material and rinse water out of sewers and water courses. Small spills - use absorbent to pick up residue and dispose of properly.

HANDLING AND STORAGE

(ANSI Section 7)

Handling and storage : Store below 80F. Store below 100F (38C). Keep away from heat, sparks and open flame. Keep away from direct sunlight, heat and all sources of ignition.

Other precautions : Use only with adequate ventilation. Do not take internally. Keep out of reach of children. Avoid contact with skin and eyes, and breathing of vapors. Wash hands thoroughly after handling, especially before eating or smoking. Keep containers tightly closed and upright when not in use. Avoid conditions which result in formation of inhalable particles such as spraying or abrading (sanding) painted surfaces. If such conditions cannot be avoided, use appropriate respiratory protection as directed under exposure controls/personal protection. Empty containers may contain hazardous residues. Ground equipment when transferring to prevent accumulation of static charge.

EXPOSURE CONTROLS/PERSONAL PROTECTION

(ANSI Section 8)

Respiratory protection : Respiratory protection is required for use in isocyanate containing environments. Consider type of application and environmental concentrations when selecting respiratory protection. Observe governmental regulations for respirator use. (29 CFR

1910.134(OSHA))(Canadian z94.4) The use of positive pressure supplied air respirator is

mandatory when the airborne isocyanate concentrations are not known. Note: isocyanate based materials have been determined to cause allergic sensitization in humans. Avoid inhalation and dermal (skin) contact with the uncured material.

Ventilation : Provide dilution ventilation or local exhaust to prevent build-up of vapors. Use explosion-proof equipment. Use non-sparking equipment.

Personal protective equipment : Eye wash, safety shower, safety glasses or goggles. Impervious gloves, impervious clothing, face shield, apron.

STABILITY AND REACTIVITY

(ANSI Section 10)

Under normal conditions : Stable see section 5 fire fighting measures

Materials to avoid : Oxidizers, acids, reducing agents, bases, aldehydes, halogens, amines, hydrogen chloride, peroxides, ammonia, nitric acid, vinyl polymers, metal compounds, phosphorus, hydrogen fluoride, magnesium, caustics. Nitrates.

Conditions to avoid : Elevated temperatures, contact with oxidizing agent, sparks, open flame, ignition sources.

Hazardous polymerization : Will not occur

The information contained herein is based on data available at the time of preparation of this data sheet which ICI Paints believes to be reliable. However, no warranty is expressed or implied regarding the accuracy of this data. ICI Paints shall not be responsible for the use of this information, or of any product, method or apparatus mentioned and you must make your own determination of its suitability and completeness for your own use, for the protection of the environment, and the health and safety of your employees and the users of this material. Complies with OSHA hazard communication standard 29CFR1910.1200.

TOXICOLOGICAL INFORMATION

(ANSI Section 11)

Supplemental information: Contains a chemical that is moderately toxic by inhalation. Contains a chemical that may be absorbed through skin. Free diisocyanate may cause allergic reaction in susceptible persons. Notice - reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Other effects of overexposure may include toxicity to liver, kidney, lungs, central nervous system, blood.

Carcinogenicity: Decomposition of diarylide pigments at temperatures above 392f (200c) can produce trace amounts of monoazo dyes, which can then decompose to produce aromatic amines. As the temperature increases into the 464-572f (240-300c), trace quantities of 3,3'-dichlorobenzidine (3,3'-dcb) can be detected. The national toxicity program (NTP) has classified 3,3'-dcb as a known human carcinogen. The international agency for research on cancer (IARC) has classified 3,3'-dcb as a possible human carcinogen (group 2b: sufficient animal data, inadequate human data). The international agency for research on cancer (IARC) has classified carbon black as possibly carcinogenic to humans (group 2b) based on sufficient evidence in animals and inadequate evidence in humans. The international agency for research on cancer (IARC) has evaluated ethylbenzene and classified it as a possible human carcinogen (group 2b) based on sufficient evidence for carcinogenicity in experimental animals, but inadequate evidence for cancer in exposed humans. In a 2 year inhalation study conducted by the national toxicology program (NTP), ethylbenzene vapor at 750 ppm produced kidney and testicular tumors in rats and lung and liver tumors in mice. Genetic toxicity studies showed no genotoxic effects. The relevance of these results to humans is not known.

Physical Data

(ANSI Sections 1, 9, and 14)

Product Code	Description	Wt. / Gal.	VOC gr. / ltr.	% Volatile by Volume	Flash Point	Boiling Range	HMIS	DOT, proper shipping name
379B0020	devthane 379hs aliphatic urethane flat finish - base	8.93	391.75	47.75	80 f	300-304	230	paint, 3, UN1263, PGIII
379B0036	devthane 379 aliphatic urethane gloss finish - base	8.29	410.44	49.09	80 f	147-304	230	paint, 3, UN1263, PGIII
379B3501	devthane 379 aliphatic urethane gloss enamel -white base	10.59	374.61	42.89	80 f	255-595	230	paint, 3, UN1263, PGIII
379B8557	devthane 379 aliphatic urethane gloss enamel -signal yellow base	8.70	402.51	46.16	80 f	255-450	130	paint, 3, UN1263, PGIII
379B9000	devthane 379 safety red	9.04	373.41	42.46	80 f	255-595	230	paint, 3, UN1263, PGIII
379B9200	devthane 379 aliphatic urethane gloss enamel safety orange base	9.22	367.78	41.90	80 f	255-595	230	paint, 3, UN1263, PGIII
379B9400	devthane 379 aliphatic urethane gloss enamel safety yellow base	10.39	377.97	43.42	80 f	255-595	330	paint, 3, UN1263, PGIII
379B9500	devthane 379 aliphatic urethane gloss enamel - white tint base	10.66	378.09	43.36	80 f	255-595	230	paint, 3, UN1263, PGIII
379B9501	devthane 379 aliphatic urethane gloss enamel -deep tint base	10.82	371.98	42.59	80 f	255-595	230	paint, 3, UN1263, PGIII
379B9502	devthane 379 aliphatic urethane gloss enamel -neutral tint base	10.72	359.39	41.02	80 f	255-595	230	paint, 3, UN1263, PGIII
379B9903	devthane 379 aliphatic urethane gloss enamel -black base	10.09	382.28	43.78	80 f	255-595	*230	paint, 3, UN1263, PGIII
379C0910	devthane 379 hs converter	9.40	112.85	13.00	135 f	293-293	*321	resin solution, combustible liquid, UN1866, PGIII

Ingredients

Product Codes with % by Weight (ANSI Section 2)

Chemical Name	Common Name	CAS. No.	379B0020	379B0036	379B3501	379B8557	379B9000	379B9200	379B9400	379B9500	379B9501	379B9903	379C0910
benzene, ethyl-	ethylbenzene	100-41-4		.1-1.0		.1-1.0	.1-1.0	.1-1.0					
2-propanol, 1-methoxy-, acetate	propylene glycol monomethyl ether	108-65-6						1-5					
2-heptanone	methyl amyl ketone	110-43-0	20-30	20-30	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	
silica gel, precipitated, crystalline-free	silica, gel, amorphous	112926-00-8	10-20										
ethane, 1,1,1-trimethylidynetris(oxy)tris-	ethyl orthoformate	122-51-0			1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5	
acetic acid, butyl ester	butyl acetate	123-86-4		10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	5-10
benzene, dimethyl-	xylene	1330-20-7	.1-1.0	.1-1.0	.1-1.0	.1-1.0	.1-1.0	.1-1.0	.1-1.0	.1-1.0	.1-1.0	.1-1.0	.1-1.0
carbon black	carbon black	1333-86-4											1-5
titanium oxide	titanium dioxide	13463-67-7			20-30	5-10		1-5	1-5	10-20	5-10		
3h-pyrazol-3-one, 4,4'-(3,3'-dichloro(1,1'-biphenyl)-4,4'-diyl)bis(azo)bis(2,4-dihydro-5-methyl-2-(4-methylphenyl)-	pigment orange 34	15793-73-4						1-5					
2-propanoic acid, ethyl ester, polymer with 2-ethylhexyl 2-propenoate	resin plasticizer	26376-86-3	1-5										

Reproductive effects: High exposures to xylene in some animal studies, often at maternal levels, have affected embryo/fetal development. The significance of this finding to humans is unknown.

Mutagenicity: No mutagenic effects are anticipated

Teratogenicity: No teratogenic effects are anticipated

ECOLOGICAL INFORMATION

(ANSI Section 12)

No ecological testing has been done by ICI paints on this product as a whole.

DISPOSAL CONSIDERATIONS

(ANSI Section 13)

Waste disposal: Dispose in accordance with all applicable regulations. Avoid discharge to natural waters.

REGULATORY INFORMATION

(ANSI Section 15)

As of the date of this MSDS, all of the components in this product are listed (or are otherwise exempt from listing) on the TSCA inventory. This product has been classified in accordance with the hazard criteria of the CPR (controlled products regulations) and the MSDS contains all the information required by the CPR.

Ingredient' (Continued)

Product Codes with % by Weight (ANSI Section 2)

Chemical Name	CAS. No.	379B0020	379B0036	379B3001	379B8557	379B9000	379B9200	379B9400	379B9500	379B9501	379B9502	379B9503	379C0910
2-propenoic acid, 2-methyl-, 2-hydroxyethyl ester, polymer with butyl 2-propenoate, ethenylbenzene and methyl 2-methyl-2-propenoate	26588-80-7	40-50	50-60										
2-naphthalenecarboxamide, 4-((4(aminoacetyl) phenyl)azo)-n-(2-ethoxyphenyl)-3-hydroxy-	2786-76-7					5-10							
hexane, 1,6-diisocyanato-, homopolymer	28182-81-2												
hindered amine	41556-26-7					1-5							90-95
c.i. pigment yellow 42	51274-00-1					1-5							
paraffin waxes and hydrocarbon waxes, microcrystalline wax	63231-60-7	1-5											
butanamide, 2-((2-methoxy-4-nitrophenyl)azo)-n-(2-methoxyphenyl)-3-oxo-	6358-31-2						1-5						
ethanol	64-17-5		1-10										
solvent naphtha (petroleum), light aromatic	64742-95-6	1-5											1-5
butanamide, 2-((4-methoxy-2-nitrophenyl)azo)-n-(2-methoxyphenyl)-3-oxo-	6528-34-3			1-5			5-10						
butanamide, 2-((2-methoxy-4-nitrophenyl)azo)-n-(2-methoxyphenyl)-3-oxo-	6558-31-2			5-10									
rosin, polymerized	65997-05-9												
silica	7631-86-9			1-5									
sulfuric acid, barium salt	7727-43-7					5-10	5-10	10-20	20-30	20-30	30-40	20-30	
2-butanone	78-93-3	1-5											
castor oil	8001-79-4			1-5		1-5	1-5	1-5	1-5	1-5	5-10	1-5	
stoddard solvent	8052-41-3					1-5							1-10
hexane, 1,6-diisocyanato-	822-06-0												
hexanol, acetate, branched and linear benzene, 1,2,4-trimethyl-	88230-35-7	5-10	10-20										
benzene, 1,2,4-trimethyl-	95-63-6												
acrylic resin	Sup. Conf.			30-40		30-40	30-40	30-40	30-40	30-40	30-40	30-40	1-5
polyol reactive diluent	Sup. Conf.				5-10								
dispersant	Sup. Conf.					1-5							

Chemical Hazard Data

(ANSI Sections 2, 8, 11, and 15)

Common Name	CAS. No.	ACGIH-TLV			OSHA-PEL			S.R.											
		8-Hour TWA	STEL	C	S	8-Hour TWA	STEL	C	S	Std.	S2	S3	CC	H	M	N	I	O	
ethylbenzene	100-41-4	100 ppm	125 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	y	n	n	y	n
propylene glycol monomethyl ether	108-65-6	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
methyl amyl ketone	110-43-0	50 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
silica, gel, amorphous	112926-00-8	10 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
ethyl orthoformate	122-51-0	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
butyl acetate	123-86-4	150 ppm	200 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
xylene	1330-20-7	100 ppm	150 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	y	n	n	n	n
carbon black	1333-86-4	3.5 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
carbon dioxide	13463-67-7	10 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
pigment orange 34	15793-73-4	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
resin plasticizer	26376-86-3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
monazo red pigment	2786-76-7	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n
aliphatic polyisocyanate	28182-81-2	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n	n

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Chemical Hazard Data (Continued) (ANSI Sections 2, 8, 11, and 15)

Common Name	CAS. No.	ACGIH-TLV			OSHA-PEL			S	8-Hour TWA	S	S2	S3	CC	H	M	N	I	O
		8-Hour TWA	STEL	C	STEL	C	S											
light stabilizer	41556-26-7	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
yellow iron oxide	51274-00-1	5 mg/m3	not est.	not est.	not est.	not est.	not est.	10 mg/m3	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
microcrystalline wax	63231-60-7	not est.	2 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
pigment yellow 74	6358-31-2	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
light aromatic solvent naphtha	64742-95-6	not est.	not est.	not est.	not est.	not est.	not est.	500x ppm	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
yellow pigment	6528-34-3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
yellow shading base	6598-31-2	15 mg/m3	not est.	not est.	not est.	not est.	not est.	10 mg/m3	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
rosin, polymerized	65997-05-9	5 mg/m3	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
amorphous silica	7631-86-9	10 mg/m3	not est.	not est.	not est.	not est.	not est.	6 mg/m3	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
barium sulfate	7727-43-7	10 mg/m3	not est.	not est.	not est.	not est.	not est.	5 mg/m3	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
methyl ethyl ketone	78-93-3	200 ppm	300 ppm	not est.	not est.	not est.	not est.	200 ppm	not est.	not est.	not est.	not est.	not est.	n	y	y	n	n
castor oil, raw	8001-79-4	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
mineral spirits	8052-41-3	100 ppm	not est.	not est.	not est.	not est.	not est.	500 ppm	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
hexamethylene diisocyanate	822-06-0	0.005 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	y	y	n	n
hexanol acetate	88230-35-7	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
pseudocumene	95-63-6	25 ppm	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	y	n	n	n
polyol reactive diluent	Sup. Conf.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n
dispersant	Sup. Conf.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	not est.	n	n	n	n	n

Footnotes:
 C=Ceiling - Concentration that should not be exceeded, even instantaneously.
 S=Skin - Additional exposure, over and above airborne exposure, may result from skin absorption.
 n/a=not applicable
 not est=not established
 CC=CERCLA Chemical
 ppm=parts per million
 mg/m3=milligrams per cubic meter
 Sup Conf=Supplier Confidential

S2=Sara Section 302 EHS
 S3=Sara Section 313 Chemical
 S.R.Stid.=Supplier Recommended Standard
 H=Hazardous Air Pollutant, M=Marine Pollutant
 P=Pollutant, S=Severe Pollutant
 Carcinogenicity Listed By:
 N=NTP, I=IARC, O=OSHA, y=yes, n=no

MATERIAL SAFETY DATA SHEET

AGFA CORPORATION
100 Challenger Road
Ridgefield Park, NJ 07660

TRANSPORTATION EMERGENCY
CALL CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

NON-TRANSPORTATION
HEALTH EMERGENCY PHONE..: (303) 623-5716
AGFA INFORMATION PHONE..: (201) 440-2500

1. CHEMICAL PRODUCT IDENTIFICATION:

PRODUCT NAME.....: G-128 Industrial X-Ray Developer Working Strength
PRODUCT CODE.....: ABC Code: FC59P001
CHEMICAL FAMILY.....: Aqueous Alkaline Solution
BUSINESS GROUP.....: Technical Imaging Systems
AGFA MSDS NUMBER.....: 265WS

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME /CAS NUMBER	EXPOSURE LIMITS	CONCENTRATION (%)
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***** HAZARDOUS INGREDIENTS *****

Potassium Sulfite 10117-38-1	OSHA : Not Established ACGIH: Not Established	5-10 %
Potassium Carbonate 584-08-7	OSHA : Not Established ACGIH: Not Established	1-5 %
Diethylene glycol 111-46-6	OSHA : Not Established ACGIH: Not Established	1-5 %
Hydroquinone 123-31-9	OSHA : 2.00 mg/m3 TWA ACGIH: 2.00 mg/m3 TWA	1-5 %

3. HAZARDS IDENTIFICATION:

* EMERGENCY OVERVIEW *
* *
* WARNING! Color: Light Yellow; Form: Liquid; Clear; Odor: *
* Odorless; Causes respiratory tract irritation; May cause *
* allergic respiratory reaction; Causes skin irritation; May *
* cause allergic skin reaction; Causes eye irritation; *
* Irritating gases/fumes may be given off during burning or *
* thermal decomposition. *

POTENTIAL HEALTH EFFECTS:

ROUTE (S) OF ENTRY.....: Eye Contact; Skin Contact; Inhalation;
Ingestion

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE INHALATION.....: The potassium sulfite, hydroquinone, and potassium carbonate in this product are expected to be irritating to the respiratory tract with symptoms of coughing, sore throat, and runny nose. Potassium sulfite may cause an allergic reaction in some asthmatics and sulfite sensitive individuals. Possible symptoms include bronchoconstriction, sweating, flushing, hives, rapid heart rate, decreased blood pressure, and anaphylaxis. Inhalation of diethylene glycol vapors is unlikely due to its low vapor pressure. However, if misted or handled at elevated temperatures, high concentrations of diethylene glycol can produce drowsiness, headache, dizziness, and nausea.

DNIC INHALATION.....: Persons who have been previously sensitized to sulfites should take precautions to prevent the inhalation of potassium sulfite.

ACUTE SKIN CONTACT.....: Potassium sulfite and hydroquinone can be irritating to the skin with symptoms of reddening, itching, and swelling. Potassium carbonate can be severely irritating with symptoms of reddening, itching, swelling, and possible burns. Hydroquinone may cause skin sensitization with symptoms of rash, itching, hives, and swelling.

CHRONIC SKIN CONTACT.....: Sensitization with dermatitis or hives may occur.

ACUTE EYE CONTACT.....: Potassium sulfite and hydroquinone can be irritating to the eyes with symptoms of tearing, stinging, reddening, and swelling. Potassium carbonate can be severely irritating with possible burns.

CHRONIC EYE CONTACT.....: Repeated exposure to hydroquinone may cause intolerance of the eyes to light. In addition, repeated overexposure to hydroquinone may cause pigment deposition, which can extend into the cornea with continued exposure to high concentrations. This pigment deposition does not impair vision.

ACUTE INGESTION.....: Ingestion of this product may cause

gastrointestinal irritation. Ingestion of diethylene glycol can result in behavioral change, drowsiness, kidney and liver failure, and coma. The oral toxicity of diethylene glycol is greater in humans than in laboratory animals. The estimated single lethal dose-oral-human is 1.0 ml/kg. Hydroquinone may be harmful if swallowed with symptoms including nausea, vomiting, drowsiness, dizziness, disorientation, bluish skin color, and stomach pain.

CHRONIC INGESTION.....: None known.
 OTHER EFFECTS OF EXPOSURE.....: See Section 11.

CARCINOGENICITY.....: The components of this product are not listed by NTP, IARC or regulated as a carcinogen by OSHA.

MEDICAL CONDITIONS

AGGRAVATED BY EXPOSURE.....: Persons with preexisting eye, skin, liver, or kidney conditions or impaired pulmonary function may be more susceptible to the effects of this product.

4. FIRST AID MEASURES:

FIRST AID FOR EYES.....: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

FIRST AID FOR SKIN.....: In case of contact, remove contaminated clothing, immediately wash skin with plenty of water. Wash clothing before reuse. Call a physician if irritation persists.

FIRST AID FOR INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

FIRST AID FOR INGESTION.: Drink 1-2 glasses of water. Never give anything by mouth to an unconscious person. Seek medical attention. Take this MSDS to physician.

5. FIRE FIGHTING MEASURES:

FLASH POINT.....: Noncombustible

EXTINGUISHING MEDIA.....: Material is not combustible. Use extinguishing media suitable for other combustible materials in the area.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus.

UNUSUAL FIRE / EXPLOSION HAZARDS: When heated to decomposition emission of toxic fumes of SO2 is possible.

ACCIDENTAL RELEASE MEASURES:

SPILL OR LEAK PROCEDURES.....: Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up. Dike Spill. Prevent liquid from entering sewers, waterways or low areas. Soak up with sawdust, sand, oil dry or other absorbent material. Spill may be neutralized with powdered Citric Acid.

7. HANDLING AND STORAGE:

STORAGE TEMPERATURE (MIN/MAX): Store between 40 F (4.4 C) and 80 F (26 C). Preferred storage is at 68 F (20 C).

SHELF LIFE.....: N.A.

SPECIAL SENSITIVITY.....: Keep from freezing.

HANDLING/STORAGE PRECAUTIONS: Avoid eye and skin contact, and store in well ventilated area. Keep container tightly closed. Do not store with incompatible materials. Do not store or consume food, drink or tobacco in area where they may become contaminated with this material.

OTHER NOTES.....: Keep out of the reach of children.

6. PERSONAL PROTECTION:

PROTECTIVE CLOTHING REQUIREMENTS...: Splash protection required for eyes, e.g., eye glasses with side shields or goggles. For skin protection use chemical resistant gloves and aprons.

VENTILATION REQUIREMENTS.....: Use sufficient general room ventilation and/or local exhaust to maintain airborne levels of vapors below applicable exposure limits (see Section 2).

RESPIRATOR REQUIREMENTS.....: Under normal conditions of use, respirator protection is not required. If respirators are used, institute a program in accordance with OSHA standard 29CFR1010.134.

ADDITIONAL PROTECTIVE MEASURES.....: Emergency showers and eye wash stations should be made available. Educate and train employees in the safe use and handling of this product.

9. PHYSICAL AND CHEMICAL PROPERTIES:

PHYSICAL FORM.....: Liquid
APPEARANCE.....: Clear
COLOR.....: Light Yellow
ODOR.....: Odorless
pH.....: Approx. 10.5
BOILING POINT.....: Approx. 212 F (100 C)
MELTING/FREEZING POINT.....: Approx. 32 F (0 C)
SOLUBILITY IN WATER.....: Soluble
SPECIFIC GRAVITY.....: Approx. 1.07
BULK DENSITY.....: Not Applicable
VAPOR PRESSURE.....: Not Established

10. STABILITY AND REACTIVITY:

STABILITY.....: This is a stable material.
HAZARDOUS POLYMERIZATION...: Will not occur.
INCOMPATIBILITIES.....: Strong Acids, oxidizers
INSTABILITY CONDITIONS.....: None known.
DECOMPOSITION PRODUCTS.....: In case of fire, oxides of sulfur, CO₂, carbon monoxide and other potentially toxic fumes.

TOXICOLOGICAL INFORMATION:

TOXICITY DATA FOR: Diethylene Glycol

CHRONIC TOXICITY.....: This product contains diethylene glycol. Repeated ingestion of diethylene glycol over two years produced liver and kidney damage and bladder stones in laboratory rats.1

1 NIOSH-Registry of Toxic Effects of Chemical Substances

TOXICITY DATA FOR: Hydroquinone

ACUTE TOXICITY

ORAL LD50.....: 320 mg/kg (Rat) (1)

SKIN EFFECTS.....: 2% skin - mild (Human); 5% skin - severe (Human) (1)

OTHER ACUTE EFFECTS: Oral-Human LDLO: 29 mg/kg (1)

CHRONIC TOXICITY.....: Adverse kidney effects have been observed primarily in one strain of male rat (F-344) following chronic administration of oral doses. Nephropathy did not occur in two other strains of rats, mice, or dogs. (2)

CARCINOGENICITY.....: Formation of benign kidney tumors occurred only after nephropathy developed and only in one strain of male rat. Additional effects have been reported. Although an increase in leukemia was reported in the

female F-344 rat, this result was not reproduced in a subsequent study. There was no evidence of cancer in male mice following chronic oral administration of hydroquinone. Increases in primarily benign tumors were noted in female mice, although this finding was not reproduced in a subsequent study. No tumors were reported in mice following long-term dermal application of hydroquinone. (2)

MUTAGENICITY.....: Studies using the Ames' test were generally negative. There is some evidence for mutagenicity from studies in animals, in isolated cells taken from animals and plants, and in other microorganisms. (2)

DEVELOPMENTAL TOXICITY: Hydroquinone has not caused birth defects when administered orally at dose levels not causing systemic toxicity in the mother. (2)

REPRODUCTION.....: Hydroquinone has not caused reproductive effects in male or female animals when administered orally at dose levels not causing systemic toxicity in the mother. (2)

- 1 Occupational Health Services Material Safety Data Sheet
- 2 Hydroquinone Health, Safety, and Environmental Information, Eastman Chemical Company

12. ECOLOGICAL INFORMATION:

NO ECOLOGICAL INFORMATION AVAILABLE

DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD.....: Recover nonusable free liquid and/or contaminated water, and dispose of in an approved and permitted treatment system. Remove nonusable solid material and/or contaminated soil, for disposal in an approved and permitted landfill. Discharge to sewer may require approval of permitting authority and may require pretreatment.

14. TRANSPORTATION INFORMATION:

TECHNICAL SHIPPING NAME.....: Aqueous Alkaline Solution
PRODUCT LABEL.....: G-128 Industrial X-Ray Developer Working Strength

DOT (DOMESTIC SURFACE)

HAZARD CLASS OR DIVISION: Non-Regulated

DOT (continued)

IMO / IMDG CODE (OCEAN)

HAZARD CLASS DIVISION NUMBER...: Non-Regulated

ICAO / IATA (AIR)

HAZARD CLASS DIVISION NUMBER...: Non-Regulated

15. REGULATORY INFORMATION:

OSHA STATUS.....: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA STATUS.....: On TSCA Inventory

CERCLA REPORTABLE QUANTITY...: Hydroquinone (Reportable Quantity = 100 lbs.)

SARA TITLE III:

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES...: Hydroquinone (CAS# 123-31-9) - 1-5%

SECTION 311/312 HAZARD CATEGORIES.....: Immediate Health Hazard; Delayed Health Hazard

SECTION 313 TOXIC CHEMICALS.....: Hydroquinone (CAS# 123-31-9) - 1-5%

RCRA STATUS.....: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

COMPONENT NAME /CAS NUMBER	CONCENTRATION	STATE CODE
Water 7732-18-5	85-95 %	PA3, NJ4
Potassium Sulfite 10117-38-1	5-10 %	PA3, NJ4
Potassium Carbonate 584-08-7	1-5 %	PA3, NJ4

COMPONENT NAME /CAS NUMBER	CONCENTRATION	STATE CODE
ethylene glycol 111-46-6	1-5 %	PA1, NJ4
hydroquinone 123-31-9	1-5 %	PA1, PA4, MA, NJ1, NJ3

- MA = Massachusetts Hazardous Substance List
- NJ1 = New Jersey Hazardous Substance List
- NJ3 = New Jersey Special Health Hazardous Substance List
- NJ4 = New Jersey Other - included in 5 predominant ingredients > 1%
- PA1 = Pennsylvania Hazardous Substance List
- PA3 = Pennsylvania Non-hazardous present at 3% or greater.
- PA4 = Pennsylvania Environmental Hazardous Substance List.

16. OTHER INFORMATION:

HMIS RATINGS:

Health	Flammability	Reactivity	Personal Prot
2	0	0	B
0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe			
B=Safety Glasses, Gloves			

Agfa's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS ratings are provided by Agfa as a customer service.

REASON FOR ISSUE.....: Establish MSDS
 PREPARED BY.....: R. Ruppel-Kerr
 APPROVED BY.....: H. W. Gventer
 APPROVAL DATE.....: 06/24/1998
 SUPERSEDES DATE.....: None
 MSDS NUMBER.....: 34248

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Agfa Corporation. The data on this sheet relates only to the specific material designated herein. Agfa Corporation assumes no legal responsibility for use or reliance upon these data.

MATERIAL SAFETY DATA SHEET

AGFA CORPORATION
100 Challenger Road
Ridgefield Park, NJ 07660

TRANSPORTATION EMERGENCY

CALL CHEMTREC: 800-424-9300
DISTRICT OF COLUMBIA: 202-483-7616

NON-TRANSPORTATION

HEALTH EMERGENCY PHONE...: (303) 623-5716
AGFA INFORMATION PHONE...: (201) 440-2500

1. CHEMICAL PRODUCT IDENTIFICATION:

PRODUCT NAME.....: G-335C Industrial X-Ray Fixer Part A
PRODUCT CODE.....: FXP18000 LCWUB000 LAG9U000 H3AHN000 F96P6000
CHEMICAL FAMILY.....: Aqueous Photochemical Solution
BUSINESS GROUP.....: Technical Imaging Systems
AGFA MSDS NUMBER.....: 79A

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME /CAS NUMBER	EXPOSURE LIMITS	CONCENTRATION (%)
***** HAZARDOUS INGREDIENTS *****		
Ammonium Thiosulfate 7783-18-8	OSHA : Not Established ACGIH: Not Established	45-50 %
Sodium Sulfite 7757-83-7	OSHA : Not Established ACGIH: Not Established	1-5 %
Boric Acid 10043-35-3	OSHA : Not Established ACGIH: Not Established	1-5 %

Product: G-335C Industrial X-Ray Fixer Part A
Approval date: 03/23/1998

MSDS Page 1
Continued on next page

3. HAZARDS IDENTIFICATION:

* EMERGENCY OVERVIEW *
* *
* WARNING! Color: Colorless; Form: Liquid; Clear; Odor: *
* Slight sulfur dioxide; May cause eye, skin, and respiratory *
* tract irritation; May cause allergic respiratory reaction; *
* May cause allergic skin reaction; Irritating gases/fumes may *
* be given off during burning or thermal decomposition. *

POTENTIAL HEALTH EFFECTS:

ROUTE (S) OF ENTRY.....: Eye Contact; Skin Contact; Inhalation; Ingestion

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE INHALATION.....: Inhalation of ammonium thiosulfate, sodium sulfite, and boric acid may be irritating to the respiratory tract with symptoms of sore throat, coughing, and runny nose. Sulfites may cause an allergic reaction in some asthmatics and sulfite sensitive individuals. Possible symptoms include bronchoconstriction, sweating, flushing, hives, rapid heart rate, decreased blood pressure, and anaphylaxis.

CHRONIC INHALATION.....: Repeated or prolonged inhalation of boric acid may cause pain, nausea, vomiting, diarrhea, headache, confusion and drowsiness.

TE SKIN CONTACT.....: Ammonium thiosulfate, sodium sulfite, and boric acid may be irritating to the skin with symptoms of reddening and itching. Abraded skin and moist skin may intensify these effects.

CHRONIC SKIN CONTACT.....: Repeated or prolonged contact to sulfites may cause an allergic skin reaction in sensitive individuals. Repeated or prolonged skin contact with boric acid may result in dermatitis.

ACUTE EYE CONTACT.....: Ammonium thiosulfate, sodium sulfite, and boric acid may be irritating to the eyes with symptoms of reddening, tearing, and stinging.

ACUTE INGESTION.....: Ingestion of sodium sulfite and ammonium thiosulfate may cause gastrointestinal irritation. If ingested, boric acid may cause damage to the gastrointestinal tract with pain, nausea, vomiting, diarrhea, headache, confusion and drowsiness. Ingestion may be fatal due to central nervous system depression, circulatory failure or renal failure. Liver and/or kidney damage may result from ingestion of boric acid.

CHRONIC INGESTION.....: Repeated ingestion of boric acid may cause effects similar to those mentioned in acute ingestion. Additional symptoms may include loss of appetite, reddening of the tongue, loss of hair and kidney injury.

REPRODUCTIVE EFFECTS.....: Boric Acid: Long-term high dose animal ingestion studies have shown reproductive and developmental effects. 1 A

3. HAZARDS IDENTIFICATION (Continued)

human study of occupational exposure to borate dust showed no adverse effect to reproduction.

MUTAGENICITY.....: The components of this product are not listed by NTP, IARC or regulated as a carcinogen by OSHA.

MEDICAL CONDITIONS

AGGRAVATED BY EXPOSURE.....: Persons with pre-existing eye, skin or respiratory conditions, kidney or liver disease, and nerve disorders may be more susceptible to the effects of this product.

1 Supplier MSDS

4. FIRST AID MEASURES:

FIRST AID FOR EYES.....: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

FIRST AID FOR SKIN.....: In case of contact, remove contaminated clothing, immediately wash skin with plenty of water. Wash clothing before reuse. Call a physician if irritation persists.

FIRST AID FOR INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

FIRST AID FOR INGESTION.: If swallowed, call a physician.

5. FIRE FIGHTING MEASURES:

FLASH POINT.....: Noncombustible

EXTINGUISHING MEDIA.....: Material is not combustible. Use extinguishing media suitable for other combustible materials in the area.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus.

UNUSUAL FIRE / EXPLOSION HAZARDS: When heated to decomposition emission of toxic fumes of SO₂ is possible.

6. ACCIDENTAL RELEASE MEASURES:

SPILL OR LEAK PROCEDURES.....: Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up. Dike Spill. Prevent liquid from entering sewers, waterways or low areas. Soak up with sawdust, sand, oil dry or

6. ACCIDENTAL RELEASE MEASURES (Continued)

other absorbent material.

7. HANDLING AND STORAGE:

STORAGE TEMPERATURE (MIN/MAX): Store between 40 F (4.4 C) and 80 F (26 C).
Preferred storage is at 68 F (20 C).

SHELF LIFE.....: N.A.

SPECIAL SENSITIVITY.....: Keep from freezing.

HANDLING/STORAGE PRECAUTIONS: Avoid eye and skin contact, and store in well-ventilated area. Keep container tightly closed. Do not store with incompatible materials. Do not store or consume food, drink or tobacco in area where they may become contaminated with this material.

OTHER NOTES.....: Keep out of the reach of children.

8. PERSONAL PROTECTION:

PROTECTIVE CLOTHING REQUIREMENTS....: Splash protection required for eyes, e.g., eye glasses with side shields or goggles. For skin protection use chemical resistant gloves and aprons.

VENTILATION REQUIREMENTS.....: Use sufficient general room ventilation and/or local exhaust to maintain airborne levels of vapors below applicable exposure limits (see Section 2).

RESPIRATOR REQUIREMENTS.....: Under normal conditions of use, respirator protection is not required. If respirators are used, institute a program in accordance with OSHA standard 29CFR1010.134.

ADDITIONAL PROTECTIVE MEASURES.....: Emergency showers and eye wash stations should be made available. Educate and train employees in the safe use and handling of this product.

9. PHYSICAL AND CHEMICAL PROPERTIES:

PHYSICAL FORM.....: Liquid
APPEARANCE.....: Clear
COLOR.....: Colorless
ODOR.....: Slight sulfur dioxide
pH.....: Approx. 5.2
BOILING POINT.....: Approx. 212 F (100 C)
MELTING/FREEZING POINT.....: Not Established
SOLUBILITY IN WATER.....: Soluble
SPECIFIC GRAVITY.....: Approx. 1.35
BULK DENSITY.....: Not Applicable
% VOLATILE BY WEIGHT.....: Not Established

Product: G-335C Industrial X-Ray Fixer Part A
Approval date: 03/23/1998

MSDS Page 4
Continued on next page

9. PHYSICAL AND CHEMICAL PROPERTIES (Continued)

VAPOR PRESSURE: Not Established

10. STABILITY AND REACTIVITY:

STABILITY.....: This is a stable material.
HAZARDOUS POLYMERIZATION...: Will not occur.
INCOMPATIBILITIES.....: Strong alkali, strong acids
INSTABILITY CONDITIONS.....: None Known
DECOMPOSITION PRODUCTS.....: Oxides of sulfur, CO2, carbon monoxide, ammonia

11. TOXICOLOGICAL INFORMATION:

NO ANIMAL TOXICITY INFORMATION AVAILABLE

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION AVAILABLE

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD.....: Recover nonusable free liquid and/or contaminated water, and dispose of in an approved and permitted treatment system. Remove nonusable solid material and/or contaminated soil, for disposal in an approved and permitted landfill. Discharge to sewer may require approval of permitting authority and may require pretreatment.

14. TRANSPORTATION INFORMATION:

TECHNICAL SHIPPING NAME.....: Aqueous Photochemical Solution
PRODUCT LABEL.....: G-335C Industrial X-Ray Fixer Part A

14. TRANSPORTATION INFORMATION (Continued)

DOT (DOMESTIC SURFACE)

HAZARD CLASS OR DIVISION: Non-Regulated

IMO / IMDG CODE (OCEAN)

HAZARD CLASS DIVISION NUMBER...: Non-Regulated

ICAO / IATA (AIR)

HAZARD CLASS DIVISION NUMBER...: Non-Regulated

15. REGULATORY INFORMATION:

OSHA STATUS.....: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA STATUS.....: On TSCA Inventory

CERCLA REPORTABLE QUANTITY...: None

SARA TITLE III:

SECTION 302 EXTREMELY

HAZARDOUS SUBSTANCES...: None

SECTION 311/312

HAZARD CATEGORIES.....: Immediate Health Hazard; Delayed Health Hazard

SECTION 313

TOXIC CHEMICALS.....: None

RCRA STATUS.....: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

COMPONENT NAME

/CAS NUMBER

CONCENTRATION

STATE CODE

Ammonium Thiosulfate

7783-18-8

45-50 %

PA1, PA4, MA, NJ1

Product: G-335C Industrial X-Ray Fixer Part A
Approval date: 03/23/1998

MSDS Page 6
Continued on next page

15. REGULATORY INFORMATION (Continued)

COMPONENT NAME	AS NUMBER	CONCENTRATION	STATE CODE
er	773 2-18-5	35-40 %	PA3, NJ4
Sodium Sulfite	775 7-83-7	1-5 %	PA3, NJ4
Boric Acid	100 43-35-3	1-5 %	PA3, NJ4

- MA = Massachusetts Hazardous Substance List
- NJ1 = New Jersey Hazardous Substance List
- NJ4 = New Jersey Other - included in 5 predominant ingredients > 1%
- PA1 = Pennsylvania Hazardous Substance List
- PA3 = Pennsylvania Non-hazardous present at 3% or greater.
- PA4 = Pennsylvania Environmental Hazardous Substance List.

16. OTHER INFORMATION:

HMIS RATINGS: Health Flammability Reactivity Personal Prot
 1 0 0 B
 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
 B=Safety Glasses, Gloves

Agfa's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS ratings are provided by Agfa as a customer service.

REASON FOR ISSUE.....: Update Format
 PREPARED BY.....: R. Ruppel-Kerr
 APPROVED BY.....: H. W. Gventer
 APPROVAL DATE.....: 03/23/1998
 SUPERSEDES DATE.....: None
 MSDS NUMBER.....: 33286

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MATERIAL SAFETY DATA SHEET

AGFA CORPORATION
100 Challenger Road
Ridgefield Park, NJ 07660

TRANSPORTATION EMERGENCY

CALL CHEMTREC: 800-424-9300
DISTRICT OF COLUMBIA: 202-483-7616

NON-TRANSPORTATION

HEALTH EMERGENCY PHONE.: (303) 623-5716
AGFA INFORMATION PHONE.: (201) 440-2500

1. CHEMICAL PRODUCT IDENTIFICATION:

PRODUCT NAME.....: G-335C Industrial X-Ray Fixer Part B
PRODUCT CODE.....: FXP18000 LCWUB000 LAG9U000 H3AHN000 F96P6000
CHEMICAL FAMILY.....: Aqueous Acidic Solution containing Sulfuric Acid, Acetic Acid, Oxalic Acid, and Aluminum Sulfate
BUSINESS GROUP.....: Technical Imaging Systems
AGFA MSDS NUMBER.....: 79B

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME /CAS NUMBER	EXPOSURE LIMITS	CONCENTRATION (%)
--------------------------------	-----------------	-------------------

***** HAZARDOUS INGREDIENTS *****

Aluminum Sulfate 10043-01-3	OSHA : Not Established ACGIH: 2.00 mg/m3 TWA*	5-10 %
*Aluminum, Soluble Salts (as Al)		
Acetic Acid 64-19-7	OSHA : 10.00 ppm TWA 25.00 mg/m3 ACGIH: 10.00 ppm TWA 25.00 mg/m3	1-5 %
Sulfuric Acid 7664-93-9	OSHA : 1.00 mg/m3 TWA ACGIH: 1.00 mg/m3 TWA 3.00 mg/m3 STEL	1-5 %

Product: G-335C Industrial X-Ray Fixer Part B
Approval date: 03/26/1998

MSDS Page 1
Continued on next page

Haz

INGREDIENT NAME /CAS NUMBER	EXPOSURE LIMITS	CONCENTRATION (%)
oxalic Acid 144-62-7	OSHA : 1.00 mg/m3 TWA 2.00 mg/m3 STEL ACGIH: 1.00 mg/m3 TWA	1-5 %

3. HAZARDS IDENTIFICATION:

 * EMERGENCY OVERVIEW *
 *
 * DANGER! Corrosive; Color: Colorless; Form: Liquid; Clear; *
 * Odor: Strong vinegar; May cause eye, skin, and respiratory *
 * tract burns; Causes digestive tract burns; Irritating *
 * gases/fumes may be given off during burning or thermal *
 * decomposition. *

POTENTIAL HEALTH EFFECTS:

ROUTE(S) OF ENTRY.....: Eye Contact; Skin Contact; Inhalation;
 Ingestion

IMMEDIATE EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE INHALATION.....: Overexposure to acetic acid vapors and aluminum sulfate can cause irritation to the respiratory tract resulting in coughing, runny nose and sore throat. Sulfuric acid and oxalic acid are corrosive and the vapors are irritating to the mucous membranes of the respiratory tract. Inhalation of sulfuric acid and oxalic acid vapors results in coughing, choking and inflammation of the respiratory tract.

CHRONIC INHALATION.....: Prolonged or repeated overexposure to oxalic acid may cause kidney damage.

ACUTE SKIN CONTACT.....: Direct contact with acetic acid, oxalic acid, and aluminum sulfate can cause skin irritation, possibly severe, with symptoms of burning, reddening, itching, and swelling. Skin sensitization with acetic acid is rare, but has been reported. Direct contact with sulfuric acid causes severe burns with symptoms of burning, reddening, itching, and blistering of the skin.

CHRONIC SKIN CONTACT.....: Repeated contact with low concentrations of sulfuric acid may cause skin desiccation (drying) and ulcerations.

ACUTE EYE CONTACT.....: Overexposure to acetic acid and oxalic acid can cause severe irritation resulting in burning, stinging, reddening, tearing, swelling and possible injury to the cornea depending on the concentration of the acid. Aluminum sulfate may cause irritation and possible corneal burns due to the reaction of the compound with moisture to form sulfuric acid. Sulfuric acid is corrosive and its vapors are irritating to the mucous membranes of the eyes. Severe eye irritation will result from exposure to sulfuric acid vapor or solution. Initial symptoms may be discomfort, tearing and/or blurring of vision. Permanent eye damage

including blindness may result if there is a delay in flushing it from the person's eyes.

CHRONIC EYE CONTACT.....: Repeated or prolonged exposure to sulfuric acid may result in lacrimation and chronic conjunctivitis.

ACUTE INGESTION.....: Swallowing concentrated acetic acid may cause severe injury. Ingestion of aluminum sulfate may cause irritation or burn the digestive tract. If ingested, sulfuric acid and oxalic acid are corrosive to the tissues with which they come in contact. Ingestion of sulfuric acid and oxalic acid may cause burning pain in the mouth, throat, esophagus and abdomen.

CHRONIC INGESTION.....: Prolonged and repeated ingestion of oxalic acid may cause kidney damage.

CARCINOGENICITY.....: The components of this product are not listed by NTP, IARC or regulated as a carcinogen by OSHA.

MEDICAL CONDITIONS

AGGRAVATED BY EXPOSURE.....: Persons with preexisting eye, skin, kidney, or respiratory tract disorders may be more susceptible to the effects of this product.

4. FIRST AID MEASURES:

FIRST AID FOR EYES.....: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

FIRST AID FOR SKIN.....: In case of contact, remove contaminated clothing, immediately wash skin with plenty of water. Wash clothing before reuse. Call a physician if irritation persists.

FIRST AID FOR INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

FIRST AID FOR INGESTION.: Do not induce vomiting. Drink 1-2 glasses of water. Never give anything by mouth to an unconscious person. Seek medical attention. Take this MSDS to physician.

5. FIRE FIGHTING MEASURES:

FLASH POINT.....: Noncombustible

EXTINGUISHING MEDIA.....: Material is not combustible. Use extinguishing media suitable for other combustible materials in the area.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus.

UNUSUAL FIRE / EXPLOSION HAZARDS: When heated to decomposition emission of toxic fumes of SO₂ is possible.

6. ACCIDENTAL RELEASE MEASURES:

SPILL OR LEAK PROCEDURES.....: Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up. Dike Spill. Prevent liquid from entering sewers, waterways or low areas. Soak up with sawdust, sand, oil dry or other absorbent material. Spill may be neutralized with powdered Sodium Carbonate.

7. HANDLING AND STORAGE:

STORAGE TEMPERATURE (MIN/MAX): Store between 40 F (4.4 C) and 80 F (26 C). Preferred storage is at 68 F (20 C).

SHELF LIFE.....: N.A.

SPECIAL SENSITIVITY.....: Keep from freezing.

HANDLING/STORAGE PRECAUTIONS: Avoid eye and skin contact, and store in well-ventilated area. Keep container tightly closed. Do not store with incompatible materials. Do not store or consume food, drink or tobacco in area where they may become contaminated with this material.

OTHER NOTES.....: Keep out of the reach of children.

8. PERSONAL PROTECTION:

PROTECTIVE CLOTHING REQUIREMENTS...: Splash protection required for eyes, e.g., eye glasses with side shields or goggles. For skin protection use chemical resistant gloves and aprons.

VENTILATION REQUIREMENTS.....: Use sufficient general room ventilation and/or local exhaust to maintain airborne levels of vapors below applicable exposure limits (see Section 2).

RESPIRATOR REQUIREMENTS.....: Under normal conditions of use, respirator protection is not required. If respirators are used, institute a program in accordance with OSHA standard 29CFR1010.134.

ADDITIONAL PROTECTIVE MEASURES.....: Emergency showers and eye wash stations should be made available. Educate and train employees in the safe use and handling of this product.

9. PHYSICAL AND CHEMICAL PROPERTIES:

PHYSICAL FORM.....: Liquid
APPEARANCE.....: Clear
COLOR.....: Colorless
ODOR.....: Strong vinegar
pH.....: Less than 0.5
BOILING POINT.....: Approx. 212 F (100 C)
MELTING/FREEZING POINT.....: Not Established
SOLUBILITY IN WATER.....: Soluble
SPECIFIC GRAVITY.....: Approx. 1.15
BULK DENSITY.....: Not Applicable
% VOLATILE BY WEIGHT.....: Not Established
VAPOUR PRESSURE.....: Not Established

10. STABILITY AND REACTIVITY:

STABILITY.....: This is a stable material.
HAZARDOUS POLYMERIZATION....: Will not occur.
INCOMPATIBILITIES.....: Strong alkali, oxidizers
INSTABILITY CONDITIONS.....: None known
DECOMPOSITION PRODUCTS.....: CO, CO2, oxides of sulfur and other potentially toxic fumes.

11. TOXICOLOGICAL INFORMATION:

TOXICITY DATA FOR: Acetic Acid

ACUTE TOXICITY

ORAL LD50.....: 3310 mg/kg (rat)
DERMAL LD50.....: 1060 mg/kg (rabbit) (1)
INHALATION LC50.....: LC50: 5620 ppm/1 hr. (mouse) (2)
EYE EFFECTS.....: Corrosive
SKIN EFFECTS.....: Corrosive

- 1 Supplier Material Safety Data Sheet
- 2 Occupational Health Services Material Safety Data Sheet

TOXICITY DATA FOR: Aluminum Sulfate

MUTAGENICITY.....: Positive mutagenicity studies in bacterial and mammalian cell assay systems.(1)

- 1 Registry of Toxic Effects of Chemical Substances (RTECS)

Product: G-335C Industrial X-Ray Fixer Part B
Approval date: 03/26/1998

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12. ECOLOGICAL INFORMATION:

NO ECOLOGICAL INFORMATION AVAILABLE

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD.....: Recover nonusable free liquid and/or contaminated water, and dispose of in an approved and permitted treatment system. Remove nonusable solid material and/or contaminated soil, for disposal in an approved and permitted landfill. Discharge to sewer may require approval of permitting authority and may require pretreatment.

14. TRANSPORTATION INFORMATION:

TECHNICAL SHIPPING NAME.....: Sulfuric Acid, Acetic Acid

PRODUCT LABEL.....: G-335C Industrial X-Ray Fixer Part B

DOT (DOMESTIC SURFACE)

PROPER SHIPPING NAME.....: Corrosive Liquid, N.O.S.
HAZARD CLASS OR DIVISION: 8
UN/NA NUMBER.....: UN1760
PACKAGING GROUP: PG II
DOT PRODUCT RQ lbs (kgs).....: None
HAZARD LABEL(s).....: Corrosive
HAZARD PLACARD(s).....: Corrosive

Limited Quantity Exception may apply to this product, for "inner packagings not over 1.0 L (0.3 gal) for liquids and 1.0 kg (2.2 lb) for solids". 173.154 (b) (1). Each package must conform to the packaging requirements of Subpart B of Part 173 and may not exceed 30 kg (66 lb) gross weight. For further information consult the 49 CFR.

IMO / IMDG CODE (OCEAN)

PROPER SHIPPING NAME.....: Corrosive Liquid, N.O.S.
HAZARD CLASS DIVISION NUMBER...: 8
UN NUMBER.....: UN1760
PACKAGING GROUP.....: II
HAZARD LABEL(s).....: Corrosive
HAZARD PLACARD(s).....: Corrosive

Product: G-335C Industrial X-Ray Fixer Part B
Approval date: 03/26/1998

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IMO / IMDG CODE (continued)

ICAO / IATA (AIR)

PROPER SHIPPING NAME.....: Corrosive Liquid, N.O.S.
HAZARD CLASS DIVISION NUMBER...: 8
UN NUMBER.....: UN1760
SUBSIDIARY RISK.....: None
PACKING GROUP.....: II
HAZARD LABEL(s).....: Corrosive
RADIOACTIVE?.....: Non-Radioactive
PASSENGER AIR - MAX. QTY.: 1 L
PASSENGER PACKING INSTRUCTION...: 808
CARGO AIR - MAX. QTY.: 30 L
CARGO AIR PACKING INSTRUCTION...: 812

15. REGULATORY INFORMATION:

OSHA STATUS.....: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.
TSCA STATUS.....: On TSCA Inventory
CERCLA REPORTABLE QUANTITY...: Acetic Acid (CAS# 64-19-7) - 5,000 lbs.; Sulfuric Acid (CAS# 7664-93-9) - 1,000 lbs.; Aluminum Sulfate (CAS# 10043-01-3) - 5,000 lbs.
RA TITLE III:
SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES...: Sulfuric Acid, CAS# 7664-93-9, (1 - 5%)
SECTION 311/312
HAZARD CATEGORIES.....: Immediate Health Hazard; Delayed Health Hazard
SECTION 313
TOXIC CHEMICALS.....: Sulfuric Acid, CAS# 7664-93-9, (1 - 5%)
RCRA STATUS.....: When discarded in its purchased form, this product meets the criteria of corrosivity, and should be managed as a hazardous waste (EPA Hazardous Waste Number D002). (40 CFR 261.20-24)

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Table with 3 columns: COMPONENT NAME /CAS NUMBER, CONCENTRATION, STATE CODE. Row 1: Aluminum Sulfate, 10043-01-3, 5-10 %, PA1, PA4, MA, NJ1

COMPONENT NAME /CAS NUMBER	CONCENTRATION	STATE CODE
Acetic Acid 64-19-7	1-5 %	PA1, PA4, MA, NJ1, NJ3
Sulfuric Acid 7664-93-9	1-5 %	PA1, PA4, MA, NJ1, NJ2, NJ3
Water 7732-18-5	80-85 %	PA3, NJ4
Oxalic Acid 144-62-7	1-5 %	PA1, MA, NJ1, NJ3

- MA = Massachusetts Hazardous Substance List
- NJ1 = New Jersey Hazardous Substance List
- NJ2 = New Jersey Environmental Hazardous Substance List
- NJ3 = New Jersey Special Health Hazardous Substance List
- NJ4 = New Jersey Other - included in 5 predominant ingredients > 1%
- PA1 = Pennsylvania Hazardous Substance List
- PA3 = Pennsylvania Non-hazardous present at 3% or greater.
- PA4 = Pennsylvania Environmental Hazardous Substance List.

16. OTHER INFORMATION:

HMIS RATINGS: Health Flammability Reactivity Personal Prot
 3 0 0 B
 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe
 B=Safety Glasses, Gloves

Agfa's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS ratings are provided by Agfa as a customer service.

REASON FOR ISSUE.....: Update format.
 PREPARED BY.....: R. Ruppel-Kerr
 APPROVED BY.....: H. W. Gventer
 APPROVAL DATE.....: 03/26/1998
 SUPERSEDES DATE.....: 05/01/1993
 MSDS NUMBER.....: 24071

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Agfa Corporation. The data on this sheet relates only to the specific material designated herein. Agfa Corporation assumes no legal responsibility for use or reliance upon these data.

MATERIAL SAFETY DATA SHEET

AGFA CORPORATION
100 Challenger Road
Ridgefield Park, NJ 07660

TRANSPORTATION EMERGENCY
CALL CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

NON-TRANSPORTATION
HEALTH EMERGENCY PHONE.: (303) 623-5716
AGFA INFORMATION PHONE.: (201) 440-2500

1. CHEMICAL PRODUCT IDENTIFICATION:

PRODUCT NAME.....: G-128 Industrial X-Ray Developer
PRODUCT CODE.....: ABC Code: FC59P001
CHEMICAL FAMILY.....: Aqueous Alkaline Solution
BUSINESS GROUP.....: Technical Imaging Systems
AGFA MSDS NUMBER.....: 265

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME /CAS NUMBER	EXPOSURE LIMITS	CONCENTRATION (%)
--------------------------------	-----------------	-------------------

***** HAZARDOUS INGREDIENTS *****

Potassium Sulfite 10117-38-1	OSHA : Not Established ACGIH: Not Established	20-25 %
Potassium Carbonate 584-08-7	OSHA : Not Established ACGIH: Not Established	1-5 %
Diethylene glycol 111-46-6	OSHA : Not Established ACGIH: Not Established	5-10 %
Hydroquinone 123-31-9	OSHA : 2.00 mg/m3 TWA ACGIH: 2.00 mg/m3 TWA	5-10 %

Product: G-128 Industrial X-Ray Developer
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INGREDIENT NAME /CAS NUMBER	EXPOSURE LIMITS	CONCENTRATION (%)
Sodium Bromide 7647-15-6	OSHA : Not Established ACGIH: Not Established	1-5 %
Sodium tetraborate 1303-96-4	OSHA : Not Established ACGIH: Not Established	1-5 %

3. HAZARDS IDENTIFICATION:

 * EMERGENCY OVERVIEW *
 * *
 * WARNING! Color: Light Yellow; Form: Liquid; Clear; Odor: *
 * Odorless; Causes respiratory tract irritation; May cause *
 * allergic respiratory reaction; Causes skin irritation; May *
 * cause allergic skin reaction; Causes eye irritation; *
 * Irritating gases/fumes may be given off during burning or *
 * thermal decomposition. *

POTENTIAL HEALTH EFFECTS:

ROUTE(S) OF ENTRY.....: Eye Contact; Skin Contact; Inhalation; Ingestion

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE INHALATION.....: The potassium sulfite, sodium tetraborate, hydroquinone, and potassium carbonate in this product are expected to be irritating to the respiratory tract with symptoms of coughing, sore throat, and runny nose. Potassium sulfite may cause an allergic reaction in some asthmatics and sulfite sensitive individuals. Possible symptoms include bronchoconstriction, sweating, flushing, hives, rapid heart rate, decreased blood pressure, and anaphylaxis. Inhalation of diethylene glycol vapors is unlikely due to its low vapor pressure. However, if misted or handled at elevated temperatures, high concentrations of diethylene glycol can produce drowsiness, headache, dizziness, and nausea.

CHRONIC INHALATION.....: Persons who have been previously sensitized to sulfites should take precautions to prevent the inhalation of potassium sulfite.

ACUTE SKIN CONTACT.....: Potassium sulfite, sodium tetraborate, sodium bromide, and hydroquinone can be irritating to the skin with symptoms of reddening, itching, and swelling. Potassium carbonate can be severely irritating with symptoms of reddening, itching, swelling, and possible burns. Hydroquinone may cause skin sensitization with symptoms of rash, itching, hives, and swelling.

CHRONIC SKIN CONTACT.....: Sensitization with dermatitis or hives may occur.

ACUTE EYE CONTACT.....: Potassium sulfite, sodium tetraborate, sodium bromide, and hydroquinone can be irritating to the eyes with symptoms of tearing, stinging, reddening, and swelling. Potassium carbonate can be severely irritating with possible burns.

CHRONIC EYE CONTACT.....: Repeated exposure to hydroquinone may cause intolerance of the eyes to light. In addition, repeated overexposure to hydroquinone may cause pigment deposition, which can extend into the cornea with continued exposure to high concentrations. This pigment deposition does not impair vision.

ACUTE INGESTION.....: Ingestion of this product may cause gastrointestinal irritation. Ingestion of diethylene glycol can result in behavioral change, drowsiness, kidney and liver failure, and coma. The oral toxicity of diethylene glycol is greater in humans than in laboratory animals. The estimated single lethal dose-oral-human is 1.0 ml/kg. Hydroquinone may be harmful if swallowed with symptoms including nausea, vomiting, drowsiness, dizziness, disorientation, bluish skin color, and stomach pain.

CHRONIC INGESTION.....: None known.

OTHER EFFECTS OF EXPOSURE.....: See Section 11.

CARCINOGENICITY.....: The components of this product are not listed by NTP, IARC or regulated as a carcinogen by OSHA.

MEDICAL CONDITIONS

AGGRAVATED BY EXPOSURE.....: Persons with preexisting eye, skin, liver, or kidney conditions or impaired pulmonary function may be more susceptible to the effects of this product.

FIRST AID MEASURES:

FIRST AID FOR EYES.....: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

FIRST AID FOR SKIN.....: In case of contact, remove contaminated clothing, immediately wash skin with plenty of water. Wash clothing before reuse. Call a physician if irritation persists.

FIRST AID FOR INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

FIRST AID FOR INGESTION.: Drink 1-2 glasses of water. Never give anything by mouth to an unconscious person. Seek medical attention. Take this MSDS to physician.

5. FIRE FIGHTING MEASURES:

FLASH POINT.....: Noncombustible
EXTINGUISHING MEDIA.....: Material is not combustible. Use
extinguishing media suitable for other
combustible materials in the area.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate personnel to a safe area. Keep
Personnel removed and upwind of fire. Wear self-contained breathing
Apparatus.
UNUSUAL FIRE / EXPLOSION HAZARDS: When heated to decomposition emission of
toxic fumes of SO2 is possible.

6. ACCIDENTAL RELEASE MEASURES:

SPILL, OR LEAK PROCEDURES.....: Use appropriate PERSONAL PROTECTIVE
EQUIPMENT during clean up. Dike Spill. Prevent liquid from entering
sewers, waterways or low areas. Soak up with sawdust, sand, oil dry or
other absorbent material. Spill may be neutralized with powdered Citric
Acid.

7. HANDLING AND STORAGE:

STORAGE TEMPERATURE (MIN/MAX): Store between 40 F (4.4 C) and 80 F (26 C).
Preferred storage is at 68 F (20 C).
SHELF LIFE.....: N.A.
SPECIAL SENSITIVITY.....: Keep from freezing.
HANDLING/STORAGE PRECAUTIONS: Avoid eye and skin contact, and store in well
ventilated area. Keep container tightly closed. Do not store with
incompatible materials. Do not store or consume food, drink or tobacco in
area where they may become contaminated with this material.
OTHER NOTES.....: Keep out of the reach of children.

8. PERSONAL PROTECTION:

PROTECTIVE CLOTHING REQUIREMENTS...: Splash protection required for eyes, e.g.,
eye glasses with side shields or goggles. For skin protection use chemical
resistant gloves and aprons.
VENTILATION REQUIREMENTS.....: Use sufficient general room ventilation
and/or local exhaust to maintain airborne levels of vapors below applicable
exposure limits (see Section 2).

Product: G-128 Industrial X-Ray Developer
Approval date: 06/23/1998

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RESPIRATOR REQUIREMENTS.....: Under normal conditions of use, respirator protection is not required. If respirators are used, institute a program in accordance with OSHA standard 29CFR1010.134.
ADDITIONAL PROTECTIVE MEASURES.....: Emergency showers and eye wash stations should be made available. Educate and train employees in the safe use and handling of this product.

9. PHYSICAL AND CHEMICAL PROPERTIES:

PHYSICAL FORM.....: Liquid
APPEARANCE.....: Clear
COLOR.....: Light Yellow
ODOR.....: Odorless
pH.....: Approx. 11.4
BOILING POINT.....: Approx. 212 F (100 C)
MELTING/FREEZING POINT.....: Approx. 32 F (0 C)
SOLUBILITY IN WATER.....: Soluble
SPECIFIC GRAVITY.....: Approx. 1.31
BULK DENSITY.....: Not Applicable
VAPOR PRESSURE.....: Not Established

10. STABILITY AND REACTIVITY:

STABILITY.....: This is a stable material.
HAZARDOUS POLYMERIZATION...: Will not occur.
INCOMPATIBILITIES.....: Strong Acids, oxidizers
INSTABILITY CONDITIONS.....: None known.
DECOMPOSITION PRODUCTS.....: In case of fire, oxides of sulfur, CO2, carbon monoxide and other potentially toxic fumes.

11. TOXICOLOGICAL INFORMATION:

TOXICITY DATA FOR: Diethylene Glycol
CHRONIC TOXICITY.....: This product contains diethylene glycol. Repeated ingestion of diethylene glycol over two years produced liver and kidney damage and bladder stones in laboratory rats.1

1 NIOSH-Registry of Toxic Effects of Chemical Substances

TOXICITY DATA FOR: Hydroquinone
ACUTE TOXICITY
ORAL LD50.....: 320 mg/kg (Rat) (1)

SKIN EFFECTS.....: 2% skin - mild (Human); 5% skin - severe (Human) (1)
OTHER ACUTE EFFECTS: Oral-Human LDLO: 29 mg/kg (1)
CHRONIC TOXICITY.....: Adverse kidney effects have been observed primarily in
one strain of male rat (F-344) following chronic administration of oral doses.
Nephropathy did not occur in two other strains of rats, mice, or dogs. (2)
CARCINOGENICITY.....: Formation of benign kidney tumors occurred only after
nephropathy developed and only in one strain of male rat. Additional effects
have been reported. Although an increase in leukemia was reported in the
female F-344 rat, this result was not reproduced in a subsequent study. There
was no evidence of cancer in male mice following chronic oral administration
of hydroquinone. Increases in primarily benign tumors were noted in female
mice, although this finding was not reproduced in a subsequent study. No
tumors were reported in mice following long-term dermal application of
hydroquinone. (2)
MUTAGENICITY.....: Studies using the Ames' test were generally negative.
There is some evidence for mutagenicity from studies in animals, in isolated
cells taken from animals and plants, and in other microorganisms. (2)
DEVELOPMENTAL TOXICITY: Hydroquinone has not caused birth defects when
administered orally at dose levels not causing systemic toxicity in the
mother. (2)
REPRODUCTION.....: Hydroquinone has not caused reproductive effects in
male or female animals when administered orally at dose levels not causing
systemic toxicity in the mother. (2)

- 1 Occupational Health Services Material Safety Data Sheet
- 2 Hydroquinone Health, Safety, and Environmental Information, Eastman Chemical Company

ECOLOGICAL INFORMATION:

NO ECOLOGICAL INFORMATION AVAILABLE

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD.....: Recover nonusable free liquid and/or contaminated
water, and dispose of in an approved and permitted treatment system.
Remove nonusable solid material and/or contaminated soil, for disposal in
an approved and permitted landfill. Discharge to sewer may require
approval of permitting authority and may require pretreatment.

Product: G-128 Industrial X-Ray Developer
Approval date: 06/23/1998

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14. TRANSPORTATION INFORMATION:

TECHNICAL SHIPPING NAME.....: Aqueous Alkaline Solution
PRODUCT LABEL.....: G-128 Industrial X-Ray Developer

DOT (DOMESTIC SURFACE)

HAZARD CLASS OR DIVISION: Non-Regulated

IMO / IMDG CODE (OCEAN)

HAZARD CLASS DIVISION NUMBER...: Non-Regulated

ICAO / IATA (AIR)

HAZARD CLASS DIVISION NUMBER...: Non-Regulated

15. REGULATORY INFORMATION:

OSHA STATUS.....: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA STATUS.....: On TSCA Inventory

CERCLA REPORTABLE QUANTITY...: Hydroquinone (Reportable Quantity = 100 lbs.)

RCRA TITLE III:

SECTION 302 EXTREMELY

HAZARDOUS SUBSTANCES...: Hydroquinone (CAS# 123-31-9) - 5-10%

SECTION 311/312

HAZARD CATEGORIES.....: Immediate Health Hazard; Delayed Health Hazard

SECTION 313

TOXIC CHEMICALS.....: Hydroquinone (CAS# 123-31-9) - 5-10%

RCRA STATUS.....: If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Product: G-128 Industrial X-Ray Developer
Approval date: 06/23/1998

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COMPONENT NAME /CAS NUMBER	CONCENTRATION	STATE CODE
ite r 77 32-18-5	55-60 %	PA3, NJ4
Pota ssium Sulfite 10 117-38-1	20-25 %	PA3, NJ4
Pota ssium Carbonate 58 4-08-7	1-5 %	PA3, NJ4
Diet hylene glycol 111-46-6	5-10 %	PA1, NJ4
Hydr Oquinone 123-31-9	5-10 %	PA1, PA4, MA, NJ1, NJ3
Sodium Bromide 76 47-15-6	1-5 %	PA3, NJ4
Sodium tetraborate 130 3-96-4	1-5 %	PA1, MA, NJ4

- MA = Massachusetts Hazardous Substance List
- NJ1 = New Jersey Hazardous Substance List
- NJ3 = New Jersey Special Health Hazardous Substance List
- NJ4 = New Jersey Other - included in 5 predominant ingredients > 1%
- PA1 = Pennsylvania Hazardous Substance List
- PA3 = Pennsylvania Non-hazardous present at 3% or greater.
- PA4 = Pennsylvania Environmental Hazardous Substance List.

 OTHER INFORMATION:

HMIS RATINGS: Health Flammability Reactivity Personal Prot

 2 0 0 B

 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

 B=Safety Glasses, Gloves

Agfa's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS ratings are provided by Agfa as a customer service.

REASON FOR ISSUE.....: Establish MSDS
 PREPARED BY.....: R. Ruppel-Kerr
 APPROVED BY.....: H. W. Gventer
 APPROVAL DATE.....: 06/23/1998
 SUPERSEDES DATE.....: None
 MSDS NUMBER.....: 34237

Product: G-128 Industrial X-Ray Developer
 Approval date: 06/23/1998

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Product: G-128 Industrial X-Ray Developer
Approval date: 06/23/1998

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MATERIAL SAFETY DATA SHEET

POLYGUARD PRODUCTS, INC.

ESSENTIALLY SIMILAR TO
OSHA FORM - 174

Manufacturer's Name POLYGUARD PRODUCTS, INC.		TELEPHONE NUMBER (972) 875-8421		N F P A *** FIRE HAZARDS IDENTIFICATION SYSTEM	
Address: P.O. Box 755, Ennis Texas, 75120		Date 10-29-01			
FOR EMERGENCY ASSISTANCE CALL POLYGUARD - (800) 541-4994 (DAY) OR CHEMTREC - (800) 424-9300 (24 HOURS)					
Trade Name & Synonyms - Polyguard RD-6 Pipeline Tape					
Chemical Name or Composition - Mixture		Chemical Family - Hydrocarbon		Formula - Mixture	

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NUMBER	OSHA PERMISSIBLE EXPOSURE LIMIT	AGCIH - THRESHOLD LIMIT VALUES	IS PRODUCT LISTED IN NATIONAL TOXICOLOGY PROGRAM (NTP) ANNUAL REPORT ON CARCINOGENS?	IF PRODUCT HAS BEEN EVALUATED BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), DESCRIBE RESULTS.	HAS PRODUCT BEEN FOUND TO BE A POTENTIAL CARCINOGEN BY OSHA?	% BY WGT.
Bitumen (cracking residue)	8052-42-4	5 mg/M3 (fumes)	5 mg/M3 (fumes)	NO	LISTED AS GROUP 3. (See A)	NO	67 - 74%
Polypropylene	9003-07-0	NA	NA	NO	LISTED AS GROUP 3 (See A)	NO	0 - 8%
Styrene-butadiene	9003-55-8	NA	NA	NO	LISTED AS GROUP 3 (See A)	NO	0 - 15%
Talc	14807-96-6	NA	NA	NO	LISTED AS GROUP 3 (See A)	NO	0 - 15%

*** NFPA 49 - Hazardous Chemical Data

**** This chemical is subject to the reporting requirements of Section 313 of SARA Title III

A. IARC definitions:

GROUP 1:	Carcinogenic to humans
GROUP 2A:	Probably carcinogenic to humans
GROUP 2B:	Possibly carcinogenic to humans
GROUP 3:	Not classifiable as to carcinogenic or non carcinogenic to humans
GROUP 4:	Probably not carcinogenic to humans

SECTION III - PHYSICAL DATA

BOILING POINT (°F)	N/D	SPECIFIC GRAVITY (H₂O = 1)	1.09
VAPOR PRESSURE (mm Hg)	N/D	PERCENT, VOLATILE BY VOLUME (%)	N/D
VAPOR DENSITY (AIR = 1)	N/D	EVAPORATION RATE (ETHER = 1)	N/D
SOLUBILITY IN WATER < .01	APPEARANCE AND ODOR: Black Tape, Slight Asphalt Odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA CO ₂ , Water, Foam	FLASH POINT (Method used) > 525 ° F COC	FLAMMABLE LIMITS	LEL N/D UEL N/D
SPECIAL FIRE FIGHTING PROCEDURES - Wear self-contained breathing apparatus when fighting fires.			
UNUSUAL FIRE AND EXPLOSION HAZARDS - N/D			

SECTION V - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID						
	STABLE	X	None						
INCOMPATIBILITY (Materials to Avoid) - N/D									
HAZARDOUS DECOMPOSITION OR BYPRODUCTS - CO, CO₂, Smoke			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">HAZARDOUS POLYMERIZATION</td> <td style="width: 50%; text-align: center;">MAY OCCUR</td> </tr> <tr> <td></td> <td style="text-align: center;">WILL NOT OCCUR</td> </tr> <tr> <td></td> <td style="text-align: right;">X</td> </tr> </table>	HAZARDOUS POLYMERIZATION	MAY OCCUR		WILL NOT OCCUR		X
HAZARDOUS POLYMERIZATION	MAY OCCUR								
	WILL NOT OCCUR								
	X								

SECTION VI - HEALTH HAZARD DATA

CONDITIONS TO AVOID - Excessive temperatures over 200°F	ROUTES OF ENTRY - INHALATION (X) SKIN (X) INGESTION () (Note: Inhalation entry could occur if product is heated to a molten state.)
HEALTH HAZARD (Acute Over Exposure) - SKIN - Slight irritation	
HEALTH HAZARD (Chronic Over Exposure)- SKIN - Slight irritation	
EMERGENCY AND FIRST AID PROCEDURES - SKIN - Wash area of contact thoroughly with soap and water.	

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED - N/D
WASTE DISPOSAL METHOD - Dispose in accordance with Local, State and Federal regulations.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING - Store in a dry, ventilated area away from heat. Do not reuse containers for any other products. Do not store in temperature exceeding 200°F.
OTHER PRECAUTIONS - N/D

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION - N/D
VENTILATION - LOCAL EXHAUST - N/D MECHANICAL - N/D
PROTECTIVE GLOVES - Wear impervious gloves.
EYE PROTECTION - N/D
OTHER PROTECTIVE EQUIPMENT - N/D
WORK - HYGIENIC PRACTICES - Maintain good personal hygiene.

MATERIAL SAFETY DATA SHEET

POLYGUARD PRODUCTS, INC.

ESSENTIALLY SIMILAR TO
OSHA FORM - 174

Manufacturer's Name POLYGUARD PRODUCTS, INC.		TELEPHONE NUMBER (972) 875-8421		N F P A *** FIRE HAZARDS IDENTIFICATION SYSTEM	
Address: P.O. Box 755, Ennis Texas, 75120		Date 10/29/01			
FOR EMERGENCY ASSISTANCE CALL POLYGUARD - (800) 541-4994 (DAY) OR CHE MTREC - (800) 424-9300 (24 HOURS)					
Trade Name & Synonyms - 600 Liquid Adhesive Quick Dry				HEALTH	2
				FIRE	3
				REACTIVITY	0
				SPECIFIC	0
Chemical Name or Composition - Hydrocarbon Mixture		Chemical Family - Hydrocarbon/Ketone		Formula - Mixture	

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NUMBER	OSHA PERMISSIBLE EXPOSURE LIMIT	AGCH - THRESHOLD LIMIT VALUES	IS PRODUCT LISTED IN NATIONAL TOXICOLOGY PROGRAM (NTP) ANNUAL REPORT ON CARCINOGENS?	IF PRODUCT HAS BEEN EVALUATED BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), DESCRIBE RESULTS.	HAS PRODUCT BEEN FOUND TO BE A POTENTIAL CARCINOGEN BY OSHA?	% BY WGT.
Toluene	108-88-3 ****	100 ppm	100 ppm	NO	LISTED AS GROUP 3. (See A)	NO	70-77%
Methyl Ethyl Ketone	78-93-3 ****	200 ppm	200 ppm	NO	NOT LISTED	NO	1.6%
Mineral Spirits	64742-88-7	500 ppm	100 ppm	NO	LISTED AS GROUP 3 (See A)	NO	1.5%
Other	ND	ND	ND	NO	NOT LISTED	NO	22.3%

*** NFPA 49 - Hazardous Chemical Data

**** This chemical is subject to the reporting requirements of Section 313 of SARA Title III

- A. IARC definitions:
- | | |
|-----------|---|
| GROUP 1: | Carcinogenic to humans |
| GROUP 2A: | Probably carcinogenic to humans |
| GROUP 2B: | Possibly carcinogenic to humans |
| GROUP 3: | Not classifiable as to carcinogenic or non carcinogenic to humans |
| GROUP 4: | Probably not carcinogenic to humans |

SECTION III - PHYSICAL DATA

BOILING POINT (°F)	105 ° F	SPECIFIC GRAVITY (H₂O = 1)	0.9
VAPOR PRESSURE (mm Hg)	152	PERCENT, VOLATILE BY VOLUME (%)	77-80%
VAPOR DENSITY (AIR = 1)	3.5	EVAPORATION RATE (ETHER = 1)	4.5
SOLUBILITY IN WATER	NIL	APPEARANCE AND ODOR: Black liquid / Aromatic odor	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

EXTINGUISHING MEDIA CO ₂ , dry chemical, Foam	FLASH POINT (Method used) 17° F TOC	FLAMMABLE LIMITS	LEL 1.1 UEL 7.0
--	---	-------------------------	----------------------------------

SPECIAL FIRE FIGHTING PROCEDURES - Wear self-contained breathing apparatus with a full face piece and protective clothing. Keep all persons without proper respiratory protection away from area.

UNUSUAL FIRE AND EXPLOSION HAZARDS - Vapor is heavier than air. Keep away from sparks, flames, electric motors, open pilots and static discharge. Equipment must be properly grounded. NO SMOKING.

SECTION V - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	None
COMPATIBILITY (Materials to Avoid) - Strong oxidizers			
HAZARDOUS DECOMPOSITION OR BYPRODUCTS - CO, CO ₂ , Smoke		HAZARDOUS POLYMERIZATION	MAY OCCUR
			WILL NOT OCCUR
			X

SECTION VI - HEALTH HAZARD DATA

CONDITIONS TO AVOID - Excessive temperatures over 160°F	ROUTES OF ENTRY - INHALATION (X)	SKIN (X)	INGESTION ()
HEALTH HAZARD (Acute Over Exposure) - INHALATION - Vapors and fumes can cause the following: Nasal & respiratory irritation, dizziness, weakness, fatigue, nausea, and headache, possible unconsciousness, asphyxiation. SKIN - Moderately irritating, defatting, dermatitis. INGESTION - Irritation, nausea, vomiting, diarrhea, cardiovascular collapse			
HEALTH HAZARD (Chronic Over Exposure)- INHALATION - Overexposure to components has apparently been found to cause the following effects in laboratory animals: (A) Liver abnormalities (B) Lung damage (C) Kidney damage SKIN AND INHALATION - Overexposure to components of this material has been suggested as a cause of the following effects in humans: (A) Liver abnormalities			
EMERGENCY AND FIRST AID PROCEDURES - SKIN - Wash area of contact thoroughly with soap and water. Launder contaminated clothing before reuse. EYES - Flush with water for 15 minutes. Get medical attention. INGESTED - DO NOT induce vomiting. Keep person warm, quiet and get medical attention. Do Not make an unconscious person vomit. Monitor for breathing difficulty. INHALATION - Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.			

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED - Eliminate all ignition sources: flames, flares, pilot lights, smoking, electric sparks. Stay up wind. Keep out of low areas. Stop spill at source. Keep all persons not wearing protective equipment away from area. Liquid may be taken up with sand, clay, earth, floor absorbent or other absorbent material. Avoid breathing vapors and contact with skin and eyes.
WASTE DISPOSAL METHOD - All volatile portion to evaporate completely. Dispose of non-volatile absorbent material in accordance with local, State and Federal regulations.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING - Never use welding or cutting torch on or near drums or containers (even empty) because product (even residue) can ignite explosively. Store in dry, ventilated area away from heat. Keep from flame or ignition sources. Do not reuse containers for any other products. Do not store in temperatures exceeding 100°F. Store in tightly closed containers. Metal containers should be grounded or bonded when material is transferred.
OTHER PRECAUTIONS - Empty containers may be hazardous when empty. Residue may contain explosive vapors. Keep out of reach of children. Application procedures should be performed by workmen who are skilled in the application of materials described herein in accordance with manufacturer's specifications.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION - If TLV of the product or any component is exceeded, a NIOSH/MSHA jointly approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators under specified conditions. (See your safety equipment supplies). Engineering or administrative controls should be used to reduce exposure.
VENTILATION - LOCAL EXHAUST - Use local and explosion proof mechanical exhaust to maintain exposure levels below TLV's. MECHANICAL - Use local and explosion proof mechanical exhaust to maintain exposure levels below TLV's.
PROTECTIVE GLOVES - Wear resistant gloves such as nitrile rubber.
EYE PROTECTION - Chemical resistant splash goggles in compliance with OSHA regulations.
OTHER PROTECTIVE EQUIPMENT - To prevent repeated or prolonged skin contact, wear impervious clothing and boots.
WORK - HYGIENIC PRACTICES - Maintain good personal hygiene.

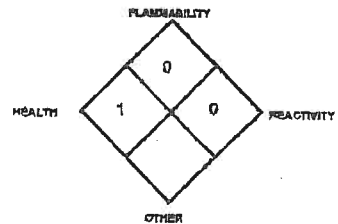
D.O.T. STATUS

D.O.T. HAZARDOUS MATERIAL	D.O.T. SHIPPING NAME AND NUMBER	D.O.T. HAZARD CLASS
YES	COATING SOLUTION, 3, UN 1139, PG II	FLAMMABLE LIQUID 3



MATERIAL SAFETY DATA SHEET

NFPA RATING



Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS:

SULFUR HEXAFLUORIDE - SF₆

PRODUCT USE:

Document Number: 001048

For general analytical/synthetic chemical uses.

SUPPLIER/MANUFACTURER'S NAME:

AIRGAS INC.

ADDRESS:

259 N. Radnor-Chester Road

Suite 100

Radnor, PA 19087-5283

1-610-687-5253

BUSINESS PHONE:

CHEMTREC: 1-800-424-9300

EMERGENCY PHONE:

International: 703-527-3887 (Call Collect)

DATE OF PREPARATION:

May 20, 1996

SECOND REVISION:

January 30, 1998

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	GAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA		IDLH	OTHER
			TLV ppm	STE L ppm	PEL ppm	STEL ppm		
Sulfur Hexafluoride	2551-62-4	> 99.8%	1000	NE	1000	NE	NE	NIOSH REL: TWA = 1000 ppm DFG MAK: 1000 ppm
Maximum Impurities		< 0.2%	None of the trace impurities in this mixture contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

NE = Not Established

C = Ceiling Limit

See Section 16 for Definitions of Terms Used

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

SULFUR HEXAFLUORIDE - SF₆ MSDS (Document # 001048)

PAGE 1 OF 7

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Sulfur Hexafluoride is a colorless, odorless, non-toxic, non-flammable gas which is shipped as a liquefied gas. The liquefied gas will rapidly boil at standard temperatures and pressures. The main health hazard associated with releases of this gas is asphyxiation, by displacement of oxygen. Contact with the liquefied gas can cause frostbite to any contaminated tissue. Sulfur Hexafluoride is not flammable or reactive under typical emergency response situations.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE:

The most significant route of overexposure for this gas is by inhalation. The following paragraphs describe symptoms of exposure by route of exposure.

INHALATION: High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. The skin of a victim of overexposure may have a blue color. Under some circumstances of overexposure, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION

12-16% Oxygen:

10-14% Oxygen:

6-10% Oxygen:

Below 6%:

SYMPTOMS OF EXPOSURE

Breathing and pulse rate increased, muscular coordination slightly disturbed.

Emotional upset, abnormal fatigue, disturbed respiration.

Nausea and vomiting, collapse or loss of consciousness.

Convulsive movements, possible respiratory collapse, and death.



OTHER POTENTIAL HEALTH EFFECTS: Contact with liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. Overexposure to Sulfur Hexafluoride may cause the following health effects:

ACUTE: The most significant hazard associated with this gas is inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, ringing in ears, headache, dizziness, indigestion, nausea, and possible death. Contact with liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to this gas.

TARGET ORGANS: Respiratory system.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	1
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8

For routine industrial applications

See Section 16 for Definition of Ratings

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO SULFUR HEXAFLUORIDE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus Personal Protective equipment should be worn.

Remove victim(s) to fresh air, as quickly as possible. In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Only trained personnel should administer supplemental oxygen.

In case of frostbite, place the frostbitten part in warm water. **DO NOT USE HOT WATER.** If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

4. FIRST-AID MEASURES (Continued)

Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (In air by volume, %): **Lower (LEL):** Not applicable.
Upper (UEL): Not applicable.

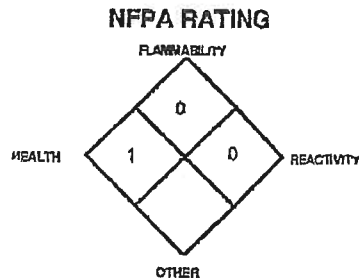
FIRE EXTINGUISHING MATERIALS: Non-flammable, inert gas. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Although Sulfur Hexafluoride is a non-flammable gas, it can present minor health hazards to firefighters. Sulfur Hexafluoride does not burn; however, containers, when involved in fire, may rupture or burst in the heat of the fire. Products of thermal decomposition of Sulfur Hexafluoride includes toxic gases (e.g., sulfuryl and thionyl fluorides).

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Sulfur Hexafluoride will not explode if exposed to static electrical discharge. Sulfur Hexafluoride is not corrosive to most metals under normal conditions. Sulfur Hexafluoride may be partially decomposed if subjected to static discharge. Some of the breakdown products are corrosive and will be enhanced by the presence of moisture or at high temperatures. Sulfur Hexafluoride also decomposes slightly in the presence of certain metals at temperatures in excess of 204°C (400°F), this effect being most pronounced with silicon and carbon steels.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. In the event of fire, cool containers of Hexafluoroethane with water to prevent failure. Use a water spray or fog to reduce or direct vapors. If cylinders are exposed to heat, the cylinder may rupture or burst and release the contents. It may be prudent to remove potentially heat-exposed cylinders from the area surrounding a fire, if it is safe for fire-fighters to do so.



See Section 15 for Definition of Ratings

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel.

Minimum Personal Protective Equipment should be **Level B: protective clothing, mechanically-resistant gloves and Self-Contained Breathing Apparatus**. Locate and seal the source of the leaking gas. Allow the gas to dissipate. Monitor the surrounding area for Sulfur Hexafluoride and oxygen levels. Sulfur Hexafluoride must be below the levels indicated in Section 2 (Composition and Information on Ingredients). The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting Sulfur Hexafluoride IN YOU. Do not eat or drink while handling chemicals. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Sulfur Hexafluoride could occur without any significant warning symptoms.

STORAGE AND HANDLING PRACTICES: Sulfur Hexafluoride should be stored in dry, well-ventilated areas separate from incompatibles, such as strong oxidizing agents, and away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Post "No Smoking or Open Flames" signs in storage or use areas. Since Sulfur Hexafluoride is non-corrosive, any of the common structural metals may be used under ordinary conditions.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated fireproof area, away from flammable materials and corrosive atmospheres.

7. HANDLING and STORAGE (Continued)

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS (continued): Store away from heat and ignition sources and out of direct sunlight. Do not store near elevators, corridors or loading docks. Do not allow area where cylinders are stored to exceed 52°C (125°F). Use only storage containers and equipment (pipes, valves, fittings to relieve pressure, etc.) designed for the storage of Liquid Sulfur Hexafluoride. Do not store containers where they can come into contact with moisture. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices. The following rules are applicable to situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap, if provided, in-place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap, if provided. Mark empty cylinders "EMPTY".

NOTE: Use only DOT or ASME code containers. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. Additionally, refer to CGA Bulletin SB-2 "Oxygen Deficient Atmospheres".

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (e.g., Nitrogen) before attempting repairs.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Local exhaust ventilation is preferred, because it prevents Sulfur Hexafluoride dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of Sulfur Hexafluoride and oxygen.

RESPIRATORY PROTECTION: Maintain Sulfur Hexafluoride levels below those indicated in Section 2 (Composition and Information on Ingredients) and oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% or during emergency response to a release of Sulfur Hexafluoride. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards.

EYE PROTECTION: Splash goggles, face-shields or safety glasses.

HAND PROTECTION: Wear mechanically-resistant gloves when handling cylinders of Sulfur Hexafluoride.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well provide sufficient insulation from cold.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY: 6.162 kg/m³ (0.38 lb/ft³)

SPECIFIC GRAVITY (air = 1): 5.114

SOLUBILITY IN WATER, v/v @ 20 °C: 0.001%

VAPOR PRESSURE (psia): 334.7

EXPANSION RATIO: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

APPEARANCE AND COLOR: Sulfur Hexafluoride is a colorless, odorless gas.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of Sulfur Hexafluoride. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

EVAPORATION RATE (nBuAc = 1): Not applicable.

MELTING POINT: -50.8°C (-59.4°F)

BOILING POINT: (Sublimation Point) -63.7°C (-82.7°F)

pH: Not applicable.

ODOR THRESHOLD: Not applicable. Odorless.

SPECIFIC VOLUME (ft³/lb): 2.5

10. STABILITY and REACTIVITY

STABILITY: Normally stable, inert gas.

DECOMPOSITION PRODUCTS: Sulfur oxides and hydrogen fluoride.

10. STABILITY and REACTIVITY (Continued)

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Sulfur Hexafluoride is non-reactive with most chemicals. Sulfur Hexafluoride, however, can react violently with disilane. Sulfur Hexafluoride is only stable at elevated temperatures [e.g., 204°C (> 400°F)] when contained in aluminum, stainless steel, copper, brass, or silver. Other metals can cause slow decomposition to sulfur-fluoride compounds. If this decomposition occurs in the presence of oxygen, thionyl fluoride compounds can be generated.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following data are for Sulfur Hexafluoride:

Standard human toxicity values are not available.

Intravenous-Rabbit, adult LD₅₀: 5790 mg/kg

Male rats were exposed for periods of 16-24 hours to 20% oxygen and 80% Sulfur Hexafluoride at 1 atmosphere ambient pressure showed no changes.

SUSPECTED CANCER AGENT: Sulfur Hexafluoride is not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC; therefore it is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Contact with rapidly expanding gases can cause frostbite and damage to exposed skin and eyes.

SENSITIZATION OF PRODUCT: Sulfur Hexafluoride is not known to be a sensitizer in humans with prolonged or repeated exposure.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Sulfur Hexafluoride on the human reproductive system.

Mutagenicity: Sulfur Hexafluoride is not expected to cause mutagenic effects in humans.

Embryotoxicity: Sulfur Hexafluoride is not expected to cause embryotoxic effects in humans.

Teratogenicity: Sulfur Hexafluoride is not expected to cause teratogenic effects in humans.

Reproductive Toxicity: Sulfur Hexafluoride is not expected to cause adverse reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be aggravated by overexposure to Sulfur Hexafluoride.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce overexposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for Sulfur Hexafluoride.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The gas will be dissipated rapidly in well-ventilated areas.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Any adverse effect on animals would be related to oxygen deficient environments. No adverse effect is anticipated to occur to plant-life, except for frost produced in the presence of rapidly expanding gases.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on Sulfur Hexafluoride's effects on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to Airgas Inc. Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Sulfur hexafluoride
HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)
UN IDENTIFICATION NUMBER: UN 1080
PACKING GROUP: Not Applicable
DOT LABEL(S) REQUIRED: Non-Flammable Gas
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 126

MARINE POLLUTANT: Sulfur Hexafluoride is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Sulfur Hexafluoride is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITIES (RQ): Not applicable.

CANADIAN DSL/NDL INVENTORY STATUS: Sulfur Hexafluoride is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Sulfur Hexafluoride is listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

CALIFORNIA PROPOSITION 65: Sulfur Hexafluoride is not on the California Proposition 65 lists.

U.S. STATE REGULATORY INFORMATION: Sulfur Hexafluoride is covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Sulfur Hexafluoride.

California - Permissible Exposure Limits for Chemical Contaminants: Sulfur Hexafluoride.

Florida - Substance List: Sulfur Hexafluoride.

Illinois - Toxic Substance List: Sulfur Hexafluoride.

Kansas - Section 302/313 List: No.

Massachusetts - Substance List: Sulfur Hexafluoride.

Michigan Critical Register List: No.

Minnesota - List of Hazardous Substances: Sulfur Hexafluoride.

Missouri - Employer Information/Toxic Substance List: Sulfur Hexafluoride.

New Jersey - Right to Know Hazardous Substance List: Sulfur Hexafluoride.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.

Pennsylvania - Hazardous Substance List: No.

Rhode Island - Hazardous Substance List: Sulfur Hexafluoride.

Texas - Hazardous Substance List: Sulfur Hexafluoride.

West Virginia - Hazardous Substance List: Sulfur Hexafluoride.

Wisconsin - Toxic and Hazardous Substances: Sulfur Hexafluoride.

LABELING:

CAUTION:

LIQUID AND GAS UNDER PRESSURE.
CAN CAUSE RAPID SUFFOCATION.
MAY CAUSE FROSTBITE.

Store and use with adequate ventilation.
Do not get liquid in eyes, on skin or clothing.
Cylinder temperature should not exceed 52°C (125°F).
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

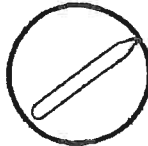
FIRST-AID:

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

IN CASE OF FROSTBITE, obtain immediate medical attention.
DO NOT REMOVE THIS PRODUCT LABEL.

CANADIAN WHMIS SYMBOLS:

Class A: Compressed Gases



16. OTHER INFORMATION

PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
619/565-0302

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. AIRGAS, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, AIRGAS, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (TWA), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (C). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated.

The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. The DFG - MAK is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). NIOSH issues exposure guidelines called Recommended Exposure Levels (RELs). When no exposure guidelines are established, an entry of NE is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard:

0 (minimal acute or chronic exposure hazard); 1 (slight acute or chronic exposure hazard); 2 (moderate acute or significant chronic exposure hazard); 3 (severe acute exposure hazard; onetime overexposures can result in permanent injury and may be fatal); 4 (extreme acute exposure hazard; onetime overexposure can be fatal).

Flammability Hazard: 0 (minimal hazard); 1 (materials that require substantial pre-heating before burning); 2 (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); 3 (Class IB and IC flammable liquids with flash points below 38°C [100°F]); 4 (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]).

Reactivity Hazard: 0 (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); 2 (materials that are unstable but do not detonate or which can react violently with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: 0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); 1 (materials that on exposure under fire conditions could cause irritation or minor residual injury); 2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); 3 (materials that can on short exposure could cause serious temporary or residual injury); 4 (materials that under very short exposure could cause death or major residual injury).

Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: LD₅₀ - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; LC₅₀ - Lethal Concentration (gases) which kills 50% of the exposed animals; ppm concentration expressed in parts of material per million parts of air or water; mg/m³ concentration expressed in weight of substance per volume of air; mg/kg quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: IARC - the International Agency for Research on Cancer; NTP - the National Toxicology Program, RTECS - the Registry of Toxic Effects of Chemical Substances, OSHA and CAL/OSHA. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include TDLo, the lowest dose to cause a symptom and TCLo the lowest concentration to cause a symptom; TD₀₁, LDLo, and LDo, or TC, TCo, LCLo, and LCo, the lowest dose (or concentration) to cause lethal or toxic effects. BEI - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information; EC is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. EPA is the U.S. Environmental Protection Agency. WHMIS is the Canadian Workplace Hazardous Materials Information System. DOT and TC are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (SARA); the Canadian Domestic/Non-Domestic Substances List (DSL/NDSL); the U.S. Toxic Substance Control Act (TSCA); Marine Pollutant status according to the DOT; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund); and various state regulations.

VERSION DATE 1/5/98

SECTION 1

PRODUCT IDENTIFICATION

COMPANY NAME WHO SENT MSDS HARRIS WELCO. DIV. OF J.W. HARRIS CO., INC.
 COMPANY ADDRESS 105 LYORK RD
 KINGS MOUNTAIN, NC 28086
 EMERGENCY PHONE NUMBER (800)-424-9300
 MSDS VERSION NUMBER 2
 TRADE NAME 6011, 6013 MILD STEEL ELECTRODES

HAZARD RATING (HMIS) NA

HMIS DESIGNATED KEY NA

SECTION 2

HAZARDOUS COMPONENTS

MATERIAL	% BY WEIGHT	CAS NUMBER	ACGIH TLV (Mg/M3)	SEC 313
IRON	70-90%	7439-89-6	10.5 (OXIDE FUME)	NA
CELLULOSE	<5	9004-34-6	10	NA
POTASSIUM TITANATE	NA	120303-97-6	NA	NA
CALCIUM CARBONATE	NA	1317-65-3	NA	NA
MAGNESIUM CARBONATE	<2	546-93-0	10	NA
TITANIUM DIOXIDE	<10	13463-67-7	5R	NA
MANGANESE	5%	7439-96-5	1,3 STEL (FUME)	YES
SODIUM SILICATE	NA	6834-92-0	NA	NA
ALUMINUM SILICATE	NA	38476-25-5	NA	NA
MICA	<5	12001-21-1	3R	NA
ZIRCONIUM SILICATE	NA	1214-23-4	NA	NA
POTASSIUM SILICATE	NA	1312-76-1	N	NA
SILICATE BINDERS	<10	NA	NOT ESTABLISHED	NA
ALUMINUM OXIDE	<5	1344-28-1	10 (AS AL)	YES

SECTION 3

PHYSICAL PROPERTIES

BOILING POINT NA
 MELTING POINT NA
 VAPOR PRESSURE NA
 VAPOR DENSITY (AIR=1) NA
 SOLUBILITY IN WATER NA
 SPECIFIC GRAVITY NA
 EVAPORATION RATE NA
 APPEARANCE AND ODOR GREY FLUX COATING - NO ODOR

SECTION 4

FIRE AND EXPLOSION DATA

FLASH POINT NA
 EXTINGUISHING MEDIA NA
 SPECIAL PROCEDURES NA
 UNUSUAL HAZARDS WELDING ARC AND SPARKS CAN IGNITE COMBUSTIBLES. SEE ANSI Z49.1, SAFETY IN WELDING AND CUTTING PUBLISHED BY AWS PO BOX 351040, MIAMI, FL 33135

SECTION 5

REACTIVITY DATA

STABILITY STABLE
 CONDITIONS TO AVOID NONE
 HAZARDOUS POLYMERIZATION NA
 INCOMPATIBILITY NA
 HAZARDOUS DECOMPOSITION PRODUCTS COMPOSITION OF WELDING FUMES AND GASES ARE DEPENDENT UPON THE METAL BEING WELDED, THE PROCESS, THE PROCEDURE COATINGS, OR CONTAMINATES ON BASE METAL, ETC. FUME CONSTITUENTS COULD INCLUDE OXIDES OF IRON, MANGANESE, SILICON AND FLUORIDES.

SECTION 6

HEALTH HAZARD DATA

ROUTES OF ENTRY INHALATION, AND SKIN (ARC BURN)
 HEALTH HAZARDS FUMES AND GASES CAN BE DANGEROUS TO YOUR HEALTH. ARC RAYS CAN BURN EYES AND SKIN. ELECTRIC SHOCK CAN KILL.
 CARCINOGENICITY NA
 SIGNS & SYMPTOMS OF EXPOSURE SHORT TERM-OVEREXPOSURE TO FUMES MAY RESULT IN DISCOMFORT (DIZZINESS, NAUSEA, DRYNESS OR IRRITATION OF NOSE, THROAT OR EYES.
 MEDICAL CONDITIONS FROM EXPOSURE RESPIRATORY OR ALLERGIC CONDITIONS.
 EMERGENCY & FIRST AID CALL FOR MEDICAL AIR. REMOVE WORKER FROM FUMES. EMPLOY FIRST AID TECHNIQUES RECOMMENDED BY THE AMERICAN RED CROSS.
 ADDITIONAL INFORMATION MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: PERSONS WITH PRE-EXISTING IMPAIRED LUNG FUNCTIONS (ASTHMA-LIKE CONDITIONS)

HANDLING AND STORING PRECAUTIONS ENVIRONMENT. DISCARD ANY PRODUCT RESIDUE, OR DISPOSABLE CONTAINER IN AN ENVIRONMENTALLY ACCEPTABLE MANNER IN FULL COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

OTHER PRECAUTIONS NONE. USE PRODUCT IN ACCORDANCE WITH ANSI STANDARD Z49.1, SAFETY IN WELDING AND CUTTING AVAILABLE FROM AWS 550 NW LEJUNE RD., PO BOX 351040, MIAMI, FL 33135.

SECTION 8 CONTROL MEASURES

RESPIRATORY MEASURES USE RESPIRABLE FUME RESPIRATOR OR AIR SUPPLIED RESPIRATOR IN CONFINED SPACE.

VENTILATION USE LOCAL EXHAUST. USE MECHANICAL EXHAUST IF NEEDED. SPECIAL IF NEEDED TO KEEP FUMES BELOW TLV.

PROTECTIVE GLOVES YES

EYE PROTECTION WEAR HELMET WITH FILTER LENS.

OTHER PROTECTIVE EQUIPMENT COVER ALL EXPOSED SKIN TO PROTECT FROM ARC BURN.

WORK/HYGIENIC PRACTICES FOR MAXIMUM SAFETY: BE CERTIFIED FOR, AND WEAR A RESPIRATOR AT ALL TIMES WHEN WELDING OR BRAZING.

SECTION 9 DISCLAIMER

THIS DATA IS BELIEVED TO BE ACCURATE. HARRIS WELCO MAKES NO WARRANTY TO AND DISCLAIMS ALL LIABILITY FROM RELIANCE.

SECTION 10 ADDITIONAL INFORMATION

NA = NOT APPLICABLE

MATERIAL SAFETY DATA SHEET

7018, 7014 MILD STEEL ELECTRODES

VERSION DATE 1/5/98

PRINT DATE 1/5/98

SECTION 1 PRODUCT IDENTIFICATION
COMPANY NAME WHO SENT MSDS HARRIS WELCO. DIV. OF J.W. HARRIS CO., INC.
COMPANY ADDRESS 1051 YORK RD
KINGS MOUNTAIN, NC 28086
EMERGENCY PHONE NUMBER (800)-424-9300
MSDS VERSION NUMBER 2
TRADE NAME 7018, 7014 MILD STEEL ELECTRODES
HAZARD RATING (HMIS) NA
HMIS DESIGNATED KEY NA

SECTION 2 HAZARDOUS COMPONENTS
Table with 5 columns: MATERIAL, % BY WEIGHT, CAS NUMBER, ACGIH TLV (Mq/M3), SEC 313
Rows include IRON, SILICON, SODIUM SILICATE, CALCIUM CARBONATE, TITANIUM DIOXIDE, MANGANESE, POTASSIUM SILICATE, CALCIUM FLUORIDE

SECTION 3 PHYSICAL PROPERTIES
BOILING POINT NA
MELTING POINT NA
VAPOR PRESSURE NA
VAPOR DENSITY (AIR=1) NA
SOLUBILITY IN WATER NA
SPECIFIC GRAVITY NA
EVAPORATION RATE NA
APPEARANCE AND ODOR GREY FLUX COATING - NO ODOR

SECTION 4 FIRE AND EXPLOSION DATA
FLASH POINT NA
EXTINGUISHING MEDIA NA
SPECIAL PROCEDURES NA
UNUSUAL HAZARDS WELDING ARC AND SPARKS CAN IGNITE COMBUSTIBLES. SEE ANSI Z49.1, SAFETY IN WELDING AND CUTTING PUBLISHED BY AWS PO BOX 351040, MIAMI, FL 33135

SECTION 5 REACTIVITY DATA
STABILITY STABLE
CONDITIONS TO AVOID NONE
HAZARDOUS POLYMERIZATION NA
INCOMPATIBILITY NA
HAZARDOUS DECOMPOSITION PRODUCTS COMPOSITION OF WELDING FUMES AND GASES ARE DEPENDENT UPON THE METAL BEING WELDED, THE PROCESS, THE PROCEDURE COATINGS, OR CONTAMINATES ON BASE METAL, ETC. FUME CONSTITUENTS COULD INCLUDE OXIDES OF IRON, MANGANESE, SILICON AND FLUORIDES.

SECTION 6 HEALTH HAZARD DATA
ROUTES OF ENTRY INHALATION, AND SKIN (ARC BURN)
HEALTH HAZARDS FUMES AND GASES CAN BE DANGEROUS TO YOUR HEALTH. ARC RAYS CAN BURN EYES AND SKIN. ELECTRIC SHOCK CAN KILL.
CARCINOGENICITY NA
SIGNS & SYMPTOMS OF EXPOSURE SHORT TERM-OVEREXPOSURE TO FUMES MAY RESULT IN DISCOMFORT (DIZZINESS, NAUSEA, DRYNESS OR IRRITATION OF NOSE, THROAT OR EYES.
MEDICAL CONDITIONS FROM EXPOSURE RESPIRATORY OR ALLERGIC CONDITIONS.
EMERGENCY & FIRST AID CALL FOR MEDICAL AIR. REMOVE WORKER FROM FUMES. EMPLOY FIRST AID TECHNIQUES RECOMMENDED BY THE AMERICAN RED CROSS.
ADDITIONAL INFORMATION NA

SECTION 7 PRECAUTIONS FOR SAFE HANDLING AND USE
SPILL AND LEAK PROCEDURES NA
WASTE AND DISPOSAL METHOD PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PRODUCT RESIDUE, OR DISPOSABLE CONTAINER IN AN ENVIRONMENTALLY ACCEPTABLE MANNER IN FULL COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.
HANDLING AND STORING PRECAUTIONS NONE

STRENGTH REDUCTIONS

USE PRODUCT IN ACCORDANCE WITH THE STANDARD
IN WELDING AND CUTTING AVAILABLE FROM AWS 550 NW LEJUNE RD.,
PO BOX 351040, MIAMI, FL 33135.

SECTION 8	CONTROL MEASURES
RESPIRATORY MEASURES	USE RESPIRABLE FUME RESPIRATOR OR AIR SUPPLIED RESPIRATOR IN CONFINED SPACE.
VENTILATION	USE LOCAL EXHAUST. USE MECHANICAL EXHAUST IF NEEDED. SPECIAL IF NEEDED TO KEEP FUMES BELOW TLV.
PROTECTIVE GLOVES	YES
EYE PROTECTION	WEAR HELMET WITH FILTER LENS.
OTHER PROTECTIVE EQUIPMENT	COVER ALL EXPOSED SKIN TO PROTECT FROM ARC BURN.
WORK/HYGIENIC PRACTICES	FOR MAXIMUM SAFETY: BE CERTIFIED FOR, AND WEAR A RESPIRATOR AT ALL TIMES WHEN WELDING OR BRAZING.

SECTION 9	DISCLAIMER
THIS DATA IS BELIEVED TO BE ACCURATE. HARRIS WELCO MAKES NO WARRANTY TO AND DISCLAIMS ALL LIABILITY FROM RELIANCE.	

SECTION 10	ADDITIONAL INFORMATION
NA = NOT APPLICABLE	



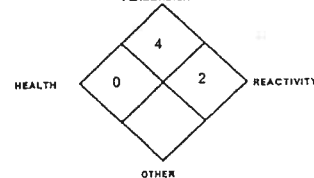
MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

ACETONE

NFPA RATING

FLAMMABILITY



PART I What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: **ACETYLENE - C₂H₂**
 Document Number: 001001

PRODUCT USE: For welding, cutting, and general analytical/synthetic chemical uses.

SUPPLIER/MANUFACTURER'S NAME: AIRGAS INC.
ADDRESS: 259 N. Radnor-Chester Road
 Suite 100
 Radnor, PA 19087-5283

BUSINESS PHONE: 1-610-687-5253
EMERGENCY PHONE: 1-800-949-7937
 International: 423-479-0293 (Call Collect)

DATE OF PREPARATION: May 20, 1996
REVISION DATE: September 25, 2000

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	
Acetylene	74-86-2	>99	Simple Asphyxiant		NE	NE	NE	NIOSH REL: 2500 ppm, ceiling Matheson maximum recommended limit for exposure: 5000 ppm
Maximum Impurities		< 1	None of the trace impurities in this mixture contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

NE = Not Established

C = Ceiling Limit

See Section 16 for Definitions of Terms Used.

NOTE: all WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Acetylene is a colorless, flammable gas, with a garlic-like odor, that is dissolved in acetone. The main health hazard associated with a release of this gas is asphyxiation by displacement of oxygen. Acetylene gas poses an extreme fire hazard when accidentally released. The gas is lighter than air, and may spread long distances. Distant ignition and flashback are possible. Flame or high temperature impinging on a localized area of the cylinder of this product can cause the cylinder to explode without activating the cylinder's relief devices. Acetylene gas may decompose explosively at elevated temperatures and pressures. Acetylene can form very explosive metallic salts (such as with copper, mercury, and silver). Provide adequate fire protection during emergency response situations.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE:

The most significant route of overexposure for this gas is by inhalation. The following paragraphs describe symptoms of exposure by route of exposure.

INHALATION: At concentration below the LEL of 2.5% (25000 ppm) this gas is essentially non-toxic. At higher concentrations, Acetylene has anesthetic effects. Symptoms of overexposure to such high concentrations may include drowsiness, dizziness, and a general feeling of weakness. High concentrations of this gas can cause an oxygen-deficient environment. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. The skin of a victim of overexposure may have a blue color. Under some circumstances of overexposure, death may occur. The following effects associated with various levels of oxygen are as follows:

CONCENTRATION

SYMPTOMS OF EXPOSURE

12-16% Oxygen:	Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea and vomiting, collapse or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

When administered with oxygen at concentrations of 10% or greater, Acetylene produces varying degrees of temporary narcosis.



OTHER POTENTIAL HEALTH EFFECTS: The gas is generally non-irritating to the skin and eyes. Acetylene is dissolved in acetone. Any skin or eye contact with the acetone component of this product may be slightly irritating to contaminated skin or eyes.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Overexposure to Acetylene may cause the following health effects:

ACUTE: The most significant hazard associated with Acetylene is inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, ringing in ears, headaches, shortness of breath, wheezing, headache, dizziness, indigestion, and nausea. At high concentrations, unconsciousness or death may occur.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to the components of this compressed gas.

TARGET ORGANS: Respiratory system, central nervous system.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	1
FLAMMABILITY		(RED)	4
REACTIVITY		(YELLOW)	2
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

See Section 16 for Definition of Ratings

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO ACETYLENE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant Personal Protective equipment should be worn. Adequate fire protection must be provided during rescue situations.

Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

SKIN EXPOSURE: If the liquid portion of this product (acetone) is spilled on skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention if redness or irritation develops.

EYE EXPOSURE: If the liquid portion of this product (acetone) splashes into eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes.

Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

FLASH POINT (Closed Cup): 0°C (32°F)

AUTOIGNITION TEMPERATURE: 305°C (581°F)

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): 2.5%

Upper (UEL): 82%

100% with substantial energy source and under certain conditions of pressure, container size and shape.

FIRE EXTINGUISHING MATERIALS: Extinguish fires of this gas by shutting-off the source of the gas. Use water spray to cool fire-exposed structures and equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this material ignites to produce toxic gases including carbon monoxide and carbon dioxide. Acetylene gas is extremely flammable and can readily form explosive mixtures with air over a very wide range. An explosion hazard exists in confined spaces when the gas is released. Pure Acetylene can explode under certain conditions of elevated pressure, temperature and container size. Acetylene reacts with active metals to form explosive acetylides compounds.

DANGER! Fires impinging (direct flame) on the outside surface of unprotected pressure storage vessels of Acetylene can be very dangerous. Direct flame exposure on the cylinder wall can cause an explosion either by BLEVE (Boiling Liquid Expanding Vapor Explosion), or by exothermic decomposition. This could cause a catastrophic failure of the vessel releasing the contents into a massive fireball and explosion. The resulting fire and explosion can result in severe equipment damage and personnel injury or death over a large area around the vessel. For massive fires in large areas, use unmanned hose holder or monitor nozzles; if this is not possible, withdraw from area and allow fire to burn.

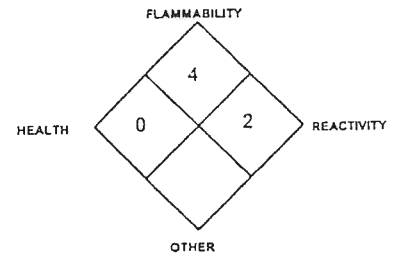
Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Static discharge may cause this gas to ignite explosively, if released.

SPECIAL FIRE-FIGHTING PROCEDURES: The best fire-fighting technique may be simply to let the burning gas escape from the pressurized cylinder, tank car, or pipeline. Stop the leak before extinguishing fire. If the fire is extinguished before the leak is sealed, the still-leaking gas could explosively re-ignite without warning and cause extensive damage, injury, or fatality. In this case, increase ventilation (in enclosed areas) to prevent flammable or explosive mixture formation. Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Because of the potential for a BLEVE, evacuation of non-emergency personnel is essential. If water is not available for cooling or protection of vessel exposures, evacuate the area. Refer to the North American Emergency Response Guidebook (Guide #116).

GAS DISSOLVED IN ACETONE

NFPA RATING



See Section 16 for Definition of Ratings

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area and protect people. Adequate fire protection must be provided.

Minimum Personal Protective Equipment should be **Level B: fire-retardant protective clothing, mechanically-resistant gloves and Self-Contained Breathing Apparatus**. Use only non-sparking tools and equipment. Locate and seal the source of the leaking gas. Protect personnel attempting the shut-off with water-spray. Allow the gas to dissipate. Monitor the surrounding area for oxygen and combustible gas levels. Combustible gas concentration must be below 10% of the LEL (LEL = 2.5%) prior to entry of any response personnel. The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus.

Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

THIS IS AN EXTREMELY FLAMMABLE GAS. Protection of all personnel and the area must be maintained.

PART III *How can I prevent hazardous situation from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting Acetylene IN YOU. Do not eat or drink while handling chemicals. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Acetylene could occur without any significant warning symptoms.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Post "No Smoking or Open Flames" signs in storage or use areas. Avoid storage for over six months and keep the smallest amount necessary on-site at any one-time. In the United States, from NFPA 51, cylinders of Acetylene stored inside buildings at the locations of use, must be limited to a total capacity of 2500 ft³ (70m³). In Canada, the limit is for a total capacity of 2160 ft³ (60 m³) in non-sprinklered buildings and 6130 ft³ (170 m³) in building with sprinkler systems. After these quantities are exceeded, a special room must be built for the storage of Acetylene. Consider installation of leak detection and alarm for storage area. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. This will prevent acetone from being released from the cylinder. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting.

Use non-sparking ventilation systems, approved explosion-proof equipment, and appropriate electrical systems. Keep the quantity stored as small as possible. Store away from process and production areas, away from elevators, building and room exits or main aisles leading to exits. Keep storage area clear of materials which can burn. Have appropriate extinguishing equipment in the storage area (e.g., sprinkler system, portable fire extinguishers).

It is important to note that Acetylene, in its free state, under pressure, may decompose violently. The higher the pressure, the smaller the initial force necessary to cause a reaction. Therefore, **never use the free gas outside the cylinder at pressures in excess of 15 psig**. If pressures exceeding this limit are utilized, special explosion and fire safety precautions must be implemented.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated area, away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 52°C (125°F). Isolate from halogens and oxidizers such as oxygen, chlorine, or fluorine. Use a check valve or trap in the discharge line to prevent hazardous backflow. Never tamper with pressure relief devices in valves and cylinders. Electrical equipment should be non-sparking or explosion proof. The following rules are applicable to work situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap (where provided) in-place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Valves should be closed tightly, to prevent evaporation of acetone. Replace valve protection cap. Mark empty cylinders "EMPTY".

7. HANDLING and STORAGE (Continued)

NOTE: Use only DOT or ASME code containers designed for acetylene storage. Earth-ground and bond all lines and equipment associated with this product. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. Additionally, refer to CGA Bulletin SB-2 "Oxygen Deficient Atmospheres" and NFPA Bulletin 58.

For welding and brazing operations, refer to ANSI Z-49.1 "Safety in Welding and Cutting" and OSHA safety regulations for welding, cutting, and brazing (29 CFR 1910.252).

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (e.g., nitrogen) before attempting repairs.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure oxygen levels are above 19.5% in the work area. Local exhaust ventilation is preferred, because it prevents Acetylene dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of oxygen and the presence of potentially explosive air-gas mixtures.

RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% or during emergency response to a release of Acetylene. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards.

EYE PROTECTION: Splash goggles or safety glasses, for protection from rapidly expanding gases and splashes of the acetone.

HAND PROTECTION: Wear mechanically-resistant gloves when handling cylinders of Acetylene. Wear Solvex or neoprene gloves if operations could lead to a potential exposure to acetone.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well as fire retardant items.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY (@ 0°C): 1.1716 kg/m³ (0.073 lb/ft³)

SPECIFIC GRAVITY (air = 1): 0.906

SOLUBILITY IN WATER @0°C (32°F) 1 atm: 1.7 vol/vol

EVAPORATION RATE (nBuAc = 1): Not applicable.

ODOR THRESHOLD (Detection): 226 ppm

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

pH: Not applicable.

FREEZING POINT (@ 10 psig): -84°C (-119°F)

BOILING POINT: -75°C (-103°F)

EXPANSION RATIO: Not applicable.

VAPOR PRESSURE (psia): 649.6

SPECIFIC VOLUME (ft³/lb): 14.7

APPEARANCE AND COLOR: Colorless gas with a garlic-like, odor dissolved in acetone.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no distinct warning properties. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.

10. STABILITY and REACTIVITY

STABILITY: Acetylene is stable at standard temperatures and pressures. Gaseous acetylene may decompose violently at elevated temperatures and pressures. Acetylene must not be used at pressures greater than 15 psig. The higher the pressure, the more likely it is for a reaction to occur.

DECOMPOSITION PRODUCTS: Carbon and hydrogen. When ignited in the presence of oxygen, carbon monoxide and carbon dioxide are formed.

10. STABILITY and REACTIVITY (Continued)

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Acetylene is not compatible with the following materials. Strong oxidizers (e.g. chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride), brass (with a copper content exceeding 65%), calcium hypochlorite, various heavy metals (copper, silver, mercury) and the salts of these metals, halogens (bromine, chlorine, iodine, fluorine), hydrides (e.g. sodium hydride, cesium hydride), ozone, perchloric acid; potassium.

HAZARDOUS POLYMERIZATION: Can occur when heated or under pressure.

CONDITIONS TO AVOID: Contact with incompatible materials and exposure to heat, sparks and other sources of ignition. Cylinders exposed to high temperatures or direct flame can rupture or burst. Liquid nitrogen should not be used as a trap, as it may cause acetylene to condense to its liquid or solid state, both of which are explosive.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following information is for Acetylene.

TCLo (inhalation, human) = 20 pph; central nervous system, respiratory system effects.

LCLo (inhalation, human) = 50 pph/5 minutes

LCLo (inhalation, human) = 500,000 ppm/5 minutes

Other data pertaining to the effects of Acetylene inhalation on humans are as follows:

<u>Concentration</u>	<u>Symptom</u>
100,000 ppm	Intoxication (drowsiness, dizziness, giddiness).
200,000 ppm	Severe intoxication.
300,000 ppm	Loss of coordination.
350,000 ppm	Unconsciousness after 5 minutes of exposure.

Effects on Short-Term Inhalation: Animals have shown tolerance to 10% Acetylene. In studies with dogs, cats, and rabbits, Acetylene acts as an anesthetic at 20% exposure. Recovery occurs if the oxygen level is maintained. In an oxygen-deficient environment, death may occur after 5-10 minutes. Rodents exposed to 25, 50, and 80 percent Acetylene in oxygen for 1-2 hours daily (93 hours total exposure), evidenced no weight change or cellular damage. Mixtures of 80% Acetylene/20% oxygen caused a rise in blood pressure in an exposed cat.

SUSPECTED CANCER AGENT: Acetylene is not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA, and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Acetylene is not irritating; however, contact with the acetone component of Acetylene can be slightly irritating to contaminated skin or eyes.

SENSITIZATION TO THE PRODUCT: Acetylene is not known to cause sensitization in humans.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects Acetylene on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for Acetylene.

Embryotoxicity: No embryotoxic effects have been described for Acetylene.

Teratogenicity: No teratogenicity effects have been described for Acetylene.

Reproductive Toxicity: No reproductive toxicity effects have been described for Acetylene.

A *mutagen* is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An *embryotoxin* is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A *teratogen* is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A *reproductive toxin* is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions may be aggravated by overexposure to the components of Acetylene.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for this gas.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen, if necessary. Treat symptoms and eliminate exposure.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: This gas will be dissipated rapidly in well-ventilated areas. The following environmental data are available for this gas.

ACETYLENE: Water Solubility = 100 vol./100 vol. at 18 EC. Acetylene is not expected to be harmful to aquatic life. Only moderately toxic to fish. Volatility and low solubility suggest it would be rare for water to become critically polluted from accidental releases. Acetylene is biodegraded through various plant and bacterial systems by inactivating atmospheric acetylene through their nitrogen-fixing mechanisms.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: Any adverse effect on animals would be related to oxygen deficient environments and the anesthetic properties of Acetylene at high concentrations of exposure. The following data are available for effects on plant-life:

Sweet pea: decline in seedling: 250 ppm, 3 days

Tomato: Epinasty in petiole: 50 ppm, 2 days.

EFFECT OF CHEMICAL ON AQUATIC LIFE: The following aquatic toxicity data are available for Acetylene.

LC50 (river trout): 33 hours, 200 mg/L

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, and local regulations. Return cylinders with residual product to Airgas. Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

<u>PROPER SHIPPING NAME:</u>	Acetylene, dissolved
<u>HAZARD CLASS NUMBER and DESCRIPTION:</u>	2.1 (Flammable Gas)
<u>UN IDENTIFICATION NUMBER:</u>	UN 1001
<u>PACKING GROUP:</u>	Not Applicable
<u>DOT LABEL(S) REQUIRED:</u>	Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 116

MARINE POLLUTANT: Acetylene is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Acetylene is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

CANADIAN DSL/NDL INVENTORY STATUS: Acetylene is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Acetylene is on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Acetylene is subject to the reporting requirements of Section 112(r) of the Clean Air Act, unless used as a fuel. The Threshold Quantity for this gas is 10,000 lb. Depending on specific operations involving the use of Acetylene, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation Acetylene is not listed in Appendix A, however, any process that involves a flammable gas on-site, in one location, in quantities of 10,000 lb (4,553 kg) or greater is covered under this regulation unless it is used as a fuel.

15. REGULATORY INFORMATION (Continued)

U.S. STATE REGULATORY INFORMATION: Acetylene is covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Acetylene.

California - Permissible Exposure Limits for Chemical Contaminants: Acetylene.

Florida - Substance List: Acetylene.

Illinois - Toxic Substance List: Acetylene.

Kansas - Section 302/313 List: No.

Massachusetts - Substance List: Acetylene.

Michigan - Critical Materials Register: No.

Minnesota - List of Hazardous Substances: Acetylene.

Missouri - Employer Information/Toxic Substance List: Acetylene.

New Jersey - Right to Know Hazardous Substance List: Acetylene.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.

Pennsylvania - Hazardous Substance List: Acetylene.

Rhode Island - Hazardous Substance List: Acetylene.

Texas - Hazardous Substance List: No.

West Virginia - Hazardous Substance List: No.

Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Acetylene is not on the California Proposition 65 lists.

LABELING:

DANGER:

FLAMMABLE GAS UNDER PRESSURE.
CAN FORM EXPLOSIVE MIXTURES WITH AIR.
FUSIBLE PLUGS ON TOP, BOTTOM, OR VALVE MELT AT 208 °F (98-104 °C).
DO NOT DISCHARGE AT PRESSURES ABOVE 15 PSIG (103 kPa)

ODOR:

Garlic-like.

Keep away from heat, flames, and sparks.
Store and use with adequate ventilation.
Use equipment rated for cylinder pressure.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

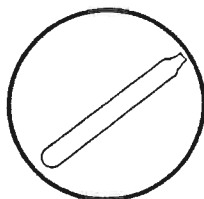
NOTE:

Cylinder contains acetone solvent, which may cause irritation.
DO NOT REMOVE THIS PRODUCT LABEL

CANADIAN WHMIS SYMBOLS:

Class A: Compressed Gases

Class B1: Flammable Gas



16. OTHER INFORMATION

PREPARED BY:

Airgas - SAFECOR

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. AIRGAS, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, AIRGAS, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (TWA), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (C). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. The **DFG** - **MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). **NIOSH** issues exposure guidelines called Recommended Exposure Levels (**RELs**). When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health

Hazard: 0 (minimal acute or chronic exposure hazard); 1 (slight acute or chronic exposure hazard); 2 (moderate acute or significant chronic exposure hazard); 3 (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); 4 (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: 0 (minimal hazard); 1 (materials that require substantial pre-heating before burning); 2 (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); 3 (Class IB and IC flammable liquids with flash points below 38°C [100°F]); 4 (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: 0 (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); 2 (materials that are unstable but do not detonate or which can react violently with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard:

0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); 1 (materials that on exposure under fire conditions could cause irritation or minor residual injury); 2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); 3 (materials that can on short exposure could cause serious temporary or residual injury); 4 (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. **IARC** and **NTP** rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TD₀**, **LDLo**, and **LD₀**, or **TC**, **TC₀**, **LCLo**, and **LC₀**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: **EC** is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA** or **Superfund**); and various state regulations.

TOSCO INDUSTRIAL

-- NO 2 DIESEL

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MSDS Safety Information
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FSC: 9140
MSDS Date: 03/07/1996
MSDS Num: CDNFD
LIIN: 00N074089
Product ID: NO 2 DIESEL
MFN: 01
Responsible Party
Cage: JO407
Name: TOSCO INDUSTRIAL
Address: 2 UNION SQUARE, 601 UNION ST, SUITE 2500
City: SEATTLE WA 98101
Info Phone Number: 206-442-7000
Emergency Phone Number: 510-228-1220;800-424-9300 (CHEMTREC)
Published: Y

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Contractor Summary
=====

Cage: JO407
Name: TOSCO INDUSTRIAL
Address: 2 UNION SQUARE, 601 UNION ST, SUITE 2500
City: SEATTLE WA 98101
Phone: 206-442-7000
Cage: TXSCX
Name: TOSCO REFINING CO
Address: 2300 CLAYTON RD
City: CONCORD CA 94520
Phone: 800-424-9300 (CHEMTREC)

=====
Ingredients
=====

Cas: 68334-30-5
RTECS #: HZ1800000
Name: DIESEL FUELS; (NO. 2 DIESEL FUEL) %: 99.8-100
% Wt: <100
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Cas: 7446-09-5
RTECS #: WS4550000
Name: SULFUR DIOXIDE (SARA 302)
% Wt: >0.5
OSHA PEL: 5 PPM
ACGIH TLV: 2 PPM/5 STEL

RTECS #: 1000314NH
Name: NON-HAZARDOUS INGREDIENTS
% Wt: <1.0
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Name: SUP DAT: PROTECT RESPONDING PERSONNEL. KEEP MATERIAL OUT OF PUBLIC SEWERS
AND WATERWAYS.

Name: EFTS OF OVEREXP: PRODS OF SIMILAR COMPOSITION HAVE PRDCED SKIN CANCER IN
LAB ANIMALS. EYE: SLIGHTLY IRRITATING.

Name: ING 5: EXPOS TO VAPS, FUMES/MISTS MAY CAUSE IRRIT. INHAL: MAY CAUSE RESP
TRACT IRRIT. CNS EFTS ARE SIMILAR TO

Name: ING 6: THOSE LISTED UNDER INGEST. DEGENERATIVE CHANGES IN LIVER, KIDNEYS
& BONE MARROW MAY OCCUR W/PRLNG HIGH

Name: ING 7: CONCS. RPTD/PRLNG EXPOS MAY CAUSE BEHAVIORAL CHANGES.

Name: FIRST AID PROC: FROM EYEBALL TO ENSURE THORO RINSING. GET MED ATTN IF
IRRIT RSLTS. INHAL: REMOVE FROM SOURCE OF

Name: ING 9: EXPOS. IF NOT BRTHG ENSURE OPEN AIRWAY & GIVE ARTF RESP/CPR AS
NEEDED. ADMIN OXYGEN IF AVAIL. GET IMMED MED ATTN.

Name: SPILL PROC: STAY UPWIND; KEEP OUT OF LOW AREAS. USE REC PERS PROT EQUIP.
KEEP UNNEC & UNPROT PERS AWAY; ISOLATE

Name: ING 11: AREA & DENY ENTRY. SHUT OFF IGNIT SOURCES; NO FLARES, SMKNG,
OPEN FLAMES/VEHICLES IN HAZ AREA. VAPS MAY

Name: ING 12: BE SUPPRESSED W/FIRE FOAM BLANKET. CONTAIN SPILL FAR DOWNSTREAM
BY DIKING. TAKE UP SML SPILLS W/SAND/

Name: ING 13: OTHER COMPATIBLE ABSORB. ANY SPILL/RELEASE/SUBSTANTIAL THREAT OF
RELEASE, OF THIS MATL TO SURF WATER,

Name: ING 14: SUFFICIENT TO CAUSE VISIBLE SHEEN ON WATER MUST BE REPORTED IMMED
TO NATL RESPONSE CTR (800/424-8802),

Name: ING 15: AS REQUIRED BY U.S. FED LAW. ALSO NOTIFY COAST GUARD & APPROP
STATE & LOC REGULATORY AGENCIES.

Name: WASTE DISP METH: AS HAZ WASTE UNDER SOME STATE/LOC REGS. CHEM ADDNS,
PROCESSING/OTHERWISE ALTERING THIS MATL

Name: ING 17: MAY MAKE THE WASTE MANAGEMENT INFO IN THIS MSDS INCOMPLETE,
INACCURATE OR OTHERWISE INAPPROPRIATE.

Name: ING 18: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL
REGULATIONS (FP N).

Name: OTHER PREC: BY MOUTH. DO NOT USE FOR CLEANING, PRESS APPLIANCE FUEL/ANY
OTHER USE EXCEPT AS MOTOR FUEL. KEEP OUT

Name: ING 20: OF REACH OF CHILDREN. EMPTY CONTRS MAY CONTAIN TOXS,
FLAM/COMBUST/EXPLO RESIDUE/VAPS. DO NOT CUT, GRIND,

Name: ING 21: DRILL, WELD, REUSE/DISPOSE CONTRS UNLESS ADEQ PREC ARE TAKEN
AGAINST THESE HAZARDS. AVOID SKIN & EYE CONTACT.

Name: OTHER PROT EQUIP: SPLASH PROT. WASH WORK CLTHG REGULARLY. REMOVE CONTAM
CLTHG. DO NOT WEAR CONTAM CLTHG NEAR

Name: ING 23: SOURCES OF IGNIT SUCH AS SPARKS/OPEN FLAMES. SOLVENT BARRIER
CREAMS MAY BE USED TO SUPPLEMENT IMPERVIOUS GLOVES.

Name: HYGIENE PRACT: REMOVE CONTAMINATED CLOTHING & CLEAN BEFORE REUSE.
SHOWER AFTER WORK USING SOAP AND WATER.
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Health Hazards Data

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LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route Of Entry Inds - Inhalation: YES

Skin: YES

Ingestion: YES

Carcinogenicity Inds - NTP: NO

IARC: NO

OSHA: NO

Effects of Exposure: ACUTE: DANGER! HARMFUL/FATAL IF SWALLOWED. ASPIR HAZ IF SWALLOWED; CAN ENTER LUNGS & CAUSE DMG. VAPS MAY BE HARMFUL. MAY BE IRRIT TO SKIN, EYES & RESP TRACT. POSS SKIN CANCER HAZ. CONTAINS MATL WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. I NGEST: ASPIR INTO LUNGS MAY CAUSE PNEUMIT. MAY CAUSE (EFTS OF OVEREXP)

Explanation Of Carcinogenicity: NOT RELEVANT.

Signs And Symptions Of Overexposure: HLTH HAZ: GI DISTURBS. SYMPS MAY INCL IRRIT, NAUS, VOMIT & DIARR. MAY CAUSE HARMFUL CNS EFTS INCL EXCITATION, EUPHORIA, HDCH, DIZZ, DROW, BLURRED VISION, FATG, TREMORS, CONVLS, LOSS OF CONSCIOUSNESS, COMA, RESP ARREST & DEATH. SKIN: MOD IRR IT. RPTD/PRLNG CONT MAY RSLT IN DERM & POSS SECONDARY INFECTION.

Medical Cond Aggravated By Exposure: NONE SPECIFIED BY MANUFACTURER.

First Aid: INGEST: DO NOT INDUCE VOMIT BECAUSE OF DANGER OF ASPIR INTO LUNGS. GET IMMED MED ATTN. IF SPONT VOMIT OCCURS, MONITOR BRTHG FOR DFCLTY. SKIN: REMOVE CONTAM CLTHG IMMED. WASH AREA THORO W/SOAP & WATER. GET MED ATTN IF IRRIT PERSISTS. HIGH PR ESS INJECTIONS ARE SERIOUS MED EMER REQUIRING IMMED MED ATTN. EYE: FLUSH IMMED W/LGE AMTS OF WATER FOR AT LEAST 15 MIN. EYELIDS SHOULD BE HELD AWAY

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Handling and Disposal

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Spill Release Procedures: IF YOUR FACILITY HAS A HAZ MATLS EMER SPILL PLAN, ACTIVATE ITS PROC. FOR TRANSPORTATION/OTHER LGE SPILLS, FOLLOW U.S. DEPT. OF TRANSPORTATION "EMER ACTION GUIDE #27". TAKE IMMED STEPS TO STOP & CONTAIN SPILL IF THERE IS NO RISK TO PERS SFTY .

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Methods: THIS MATL IN ITS ORIGINAL FORMULATION, WHEN DISCARDED/DISP OF, IS NOT SPECIFICALLY LISTED AS HAZ WASTE, HOWEVER, IT MAY BE CONSIDERED A CHARACTERISTICALLY HAZ IGNIT WASTE UNDER FED REGS WHEN IN FREE LIQ FORM. ALSO, THIS MATL MAY BE DEFINED

Handling And Storage Precautions: STORE DIESEL ONLY IN NFPA APPRVD, CLEARLY LABELED CONTRS THAT ARE TIGHTLY CLSD. NEVER STORE IN GLASS/UNAPPROVED PLASTIC CONTRS.

Other Precautions: STOR LOCATION MUST BE COOL, DRY, ISOLATED, WELL-VENTD &AWAY FROM HEAT, SOURCES OF IGNIT & INCOMPATIBLE MATLS. USE GROUNDING WIRES& EQUIP DURING PROD TRANSFER TO REDUCE POSS OF STATIC SPK CAUSED/FIRE/EXPLO. DO NOT SIPHON THIS PROD

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Fire and Explosion Hazard Information

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Flash Point Method: PMCC

Flash Point Text: >130F,>54C

Lower Limits: 0.3%

Upper Limits: 10%

Extinguishing Media: USE DRY CHEMICAL, ALL PURPOSE AFFF, ALCOHOL FOAM OR CARBON DIOXIDE TO EXTINGUISH FIRE.

Fire Fighting Procedures: WEAR NIOSH APPRVD SCBA & FULL PROT EQUIP (FP N). WATER MAY BE INEFFECTIVE FOR EXTING FIRE BUT MAY BE USED TO COOL FIRE-IMPINGED/EXPANDED CONTRS & (SUP DAT)

Unusual Fire/Explosion Hazard: CAUTION: COMBUSTIBLE LIQUID & VAPORS. DANGEROUS WHEN EXPOSED TO HEAT/FLAMES. RUNOFF TO SEWER MAY CAUSE

FIRE/EXPLOSION HAZARD. CONTAINERS MAY EXPLODE IF HEATED.

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Control Measures
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Respiratory Protection: IF VENTILATION IS NOT ADEQUATE TO REDUCE EXPOSURE BELOW PERMISSIBLE LIMITS, OR IF IRRITATION IS EXPERIENCED, NIOSH APPROVED RESPIRATORY PROTECTION SHOULD BE WORN.

Ventilation: USE ADEQUATE VENTILATION WHERE POSSIBLE.

Protective Gloves: IMPERVIOUS GLOVES.

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).

Other Protective Equipment: ANSI APPRVD EMER EYEWASH & DELUGE SHOWER (FP N).

WEAR PROT CLTHG INCL COVERALLS/LAB APRONS AS NEEDED FOR POSS

Work Hygienic Practices: USE GOOD PERSONAL HYGIENE PRACTICES. WASH HANDS BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES.

Supplemental Safety and Health: APPEAR/ODOR: DIESEL IS DYED RED. FIRE FIGHT PROC: STRUCTURES. WATER MAY BE USED TO PROTECT PERS & KEEP MATL AWAY FROM SOURCES OF IGNIT. IF LEAK/SPILL HAS NOT IGNITED, VENT AREA & USE WATER SPRAY TO DISPERSE GAS/VAP & TO PROTECT PERS ATTEMPT ING TO STOP LEAK.

FOAM BLANKETS MAY ALSO BE USED TO REDUCE VAPS &

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Physical/Chemical Properties
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B.P. Text: >320F,>160C

Vapor Pres: 0.40 @ 68F

Vapor Density: >3.0

Spec Gravity: 0.81-0.83

PH: NEUT

Appearance and Odor: HIGHWAY DIESEL IS STRAW COLORED LIQ, W/HYDROCARBON ODCR; NON-HIGHWAY (SUP DAT)

Percent Volatiles by Volume: NEGLIG

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Reactivity Data
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Stability Indicator: YES

Stability Condition To Avoid: NONE SPECIFIED BY MANUFACTURER.

Materials To Avoid: AVOID CONTACT WITH STRONG OXIDIZERS.

Hazardous Decomposition Products: BURNING MATL WILL EMIT IRRIT & TOX SUBSTANCES. COMBUST MAY PRDCE CARBON MONOXIDE & DIOXIDE & REACTIVE HYDROCARBONS.

Hazardous Polymerization Indicator: NO

Conditions To Avoid Polymerization: NOT RELEVANT.

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Toxicological Information
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Ecological Information
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MSDS Transport Information
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Regulatory Information
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Other Information
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HAZCOM Label
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Product ID: NO 2 DIESEL
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Cage: JO407
Assigned IND: Y
Company Name: TOSCO INDUSTRIAL
Street: 2 UNION SQUARE, 601 UNION ST, SUITE 2500
City: SEATTLE WA
Zipcode: 98101
Health Emergency Phone: 510-228-1220;800-424-9300 (CHEMTREC)
Label Required IND: Y
Date Of Label Review: 03/17/1997
Status Code: C
Label Date: 03/17/1997
Origination Code: G
Chronic Hazard IND: Y
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: WARNING
Respiratory Protection IND: YES
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: Moderate
Reactivity Hazard: None

Hazard And Precautions: ACUTE: HARMFUL OR FATAL IF SWALLOWED. INGESTION:
ASPIRATION INTO LUNGS MAY CAUSE PNEUMONITIS. MAY CAUSE GASTROINTESTINAL
DISTURBANCES, IRRITATION, NAUSEA, VOMITING AND DIARRHEA. MAY CAUSE CENTRAL
NERVOUS SYSTEM EFFECTS SUCH AS HEADACHE, DIZZINESS, DROWSINESS, FATIGUE,
CONVULSIONS, UNCONSCIOUSNESS, COMA AND DEATH. SKIN: MODERATE IRRITATION,
DERMATITIS. EYES: SLIGHT IRRITATION. INHALATION: RESPIRATORY TRACT IRRITATION
AND CENTRAL NERVOUS SYSTEM EFFECTS SIMILAR TO INGESTION. CHRONIC: POSSIBLE
SKIN CANCER HAZARD BASED ON LABORATORY ANIMAL DATA (MFR). DEGENERATIVE
CHANGES IN LIVER, KIDNEYS AND BONE MARROW.

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Disclaimer (provided with this information by the compiling agencies): This
information is formulated for use by elements of the Department of Defense.
The United States of America in no manner whatsoever expressly or implied
warrants, states, or intends said information to have any application, use or
viability by or to any person or persons outside the Department of Defense
nor any person or persons contracting with any instrumentality of the United
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United States of America should seek competent professional advice to verify
and assume responsibility for the suitability of this information to their
particular situation regardless of similarity to a corresponding Department
of Defense or other government situation.

MATERIAL SAFETY DATA SHEET

For Welding Consumables and Related Products
Conforms to Hazard Communication Standard 29CFR 1910.1200 Rev. October 1988

SECTION I. IDENTIFICATION

Manufacturer/Supplier: The Lincoln Electric Company 22801 St. Clair Avenue Cleveland, OH 44117-1199 (216) 481-8100	Product Type: Covered Electrode
	Classification: AWS E6010

SECTION II. HAZARDOUS MATERIALS

IMPORTANT!

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with the normal use of this product are covered by Section V; see it for industrial hygiene information.
CAS Number shown is representative for the ingredients listed. All ingredients listed may not be present in all sizes.
The term 'hazardous' in 'Hazardous Materials' should be interpreted as a term required and defined in the Hazards Communication Standard and does not necessarily imply the existence of any hazard.

(1)

Ingredients:	CAS No.	Wt. %	TLV mg/m ³	PEL mg/m ³
Celulose and other carbohydrates	65996-61-4	5	10*	10*
Silicates and other binders	1344-09-8	< 5	10*	10*
Iron	7439-89-6	< 5	10*	10*
Titanium dioxides (as Ti)***	13463-67-7	< 5	10	10
Limestone and/or calcium carbonate	1317-65-3	< 5	10	15
Manganese and/or manganese alloys and compounds (as Mn)***	7439-96-5	1	0.2	1.0(c)
Iron oxides (as Fe)	65996-74-9	< 0.5	5	10
Carbon steel core wire	7439-89-6	85	10*	10*

Supplemental information: (*) Not listed. Nuisance value maximum is 10 milligrams per cubic meter. PEL value for iron oxide is 10 mg/m³. TLV value for iron oxide is 5 milligrams per cubic meter.

(***) Subject to the reporting requirements of Sections 311, 312, and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40CFR 370 and 372.

(c) Values are for manganese fume. STEL (Short Term Exposure Limit) is 3.0 milligrams per cubic meter.

SECTION III. FIRE AND EXPLOSION HAZARD DATA

Flammable; Welding arc and sparks can ignite combustibles and flammable products. See Z49.1 referenced in Section VI.

(CONTINUED ON SIDE TWO)

AERVOE-PACIFIC -- 17A MARKING PAINT-ALL COLORS: 222 ORANGE-FLUORESCENT 00
MATERIAL SAFETY DATA SHEET
NSN: 801000F056107
Manufacturer's CAGE: 0UPL1
Part No. Indicator: A
Part Number/Trade Name: 17A MARKING PAINT-ALL COLORS 222 ORANGE/FLUORESCENT

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General Information
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Company's Name: AERVOE-PACIFIC CO INC
Company's Street: 1198 SAWMILL RD
Company's City: GARDNERVILLE
Company's State: NV
Company's Country: US
Company's Zip Code: 89410-5000
Company's Emerg Ph #: 408-295-7390/702-782-0100
Company's Info Ph #: 702-782-0100/408-295-7390
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 19AUG97
Safety Data Review Date: 12MAY98
MSDS Preparer's Name: MIKE A TRAUQUINA
Preparer's Company: AERVOE-PACIFIC CO INC
Preparer's St Or P. O. Box: 1198 SAWMILL RD
Preparer's City: GARDNERVILLE
Preparer's State: NV
Preparer's Zip Code: 89410-5000
MSDS Serial Number: 03WQY

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: XYLENE, DIMETHYLBENZENE, XYLOL (IARC - GROUP 3) *98-1*
Ingredient Sequence Number: 01
Percent: 13
NIOSH (RTECS) Number: ZE2100000
CAS Number: 1330-20-7
OSHA PEL: 100 PPM
ACGIH TLV: 100 PPM, SKIN
Other Recommended Limit: 100 PPM

Proprietary: NO
Ingredient: LIGHT ALIPHATIC NAPHTHA, VM & P NAPHTHA, LACOLENE *98-1*
Ingredient Sequence Number: 02
Percent: 20
NIOSH (RTECS) Number: 1002250AN
CAS Number: 64742-89-8
OSHA PEL: 300 PPM
ACGIH TLV: 300 PPM

Proprietary: NO
Ingredient: STODDARD SOLVENT (PETROLEUM DISTILLATE), MINERAL SPIRITS *98-1*
Ingredient Sequence Number: 03
Percent: <5
NIOSH (RTECS) Number: WJ8925000
CAS Number: 8052-41-3

OSHA PEL: 500 PPM
ACGIH TLV: 100 PPM
Other Recommended Limit: 525 MG/CUM

Proprietary: NO
Ingredient: PROPANE (DIMETHYLMETHANE) *98-1*
Ingredient Sequence Number: 04
Percent: 15
NIOSH (RTECS) Number: TX2275000
CAS Number: 74-98-6
OSHA PEL: 1000 PPM
ACGIH TLV: SIMPLE ASPHYXIAN
Other Recommended Limit: 1800 MG/CUM

Proprietary: NO
Ingredient: ISOBUTANE, 2-METHYLPROPANE
Ingredient Sequence Number: 05
Percent: <5
NIOSH (RTECS) Number: T24300000
CAS Number: 75-29-5
OSHA PEL: 1800 MG/CUM
ACGIH TLV: 1000 PPM
Other Recommended Limit: 1000 PPM

Proprietary: NO
Ingredient: BUTANE, N-BUTANE *98-1*
Ingredient Sequence Number: 06
Percent: 5
NIOSH (RTECS) Number: E34200000
CAS Number: 106-97-2
OSHA PEL: 800 PPM
ACGIH TLV: 1900 MG/CUM
Other Recommended Limit: 800 PPM

Proprietary: NO
Ingredient: VOLATILE ORGANIC CONTENT: 4.70 LBS/GAL
Ingredient Sequence Number: 07
NIOSH (RTECS) Number: 9999999VO

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Physical/Chemical Characteristics
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Appearance And Odor: OPAQUE LIQUID W/SOLVENT ODCR
Boiling Point: 100F
Vapor Density (Air=1): >1
Specific Gravity: 0.8
Evaporation Rate And Ref: FASTER THAN N-BU AC
Solubility In Water: NEGLIGIBLE

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Fire and Explosion Hazard Data
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Flash Point: -250F
Flash Point Method: TCC
Lower Explosive Limit: 0.7
Upper Explosive Limit: 9.5
Extinguishing Media: FOAM, ALCOHOL FOAM, CO2, DRY CHEMICAL, WATER FOG.
Special Fire Fighting Proc: WATER SPRAY MAY BE INEFFECTIVE, BUT WATER SPRAY MAY BE USED TO COOL CONTAINERS EXPOSED TO HEAT/FIRE TO PREVENT PRESSURE BUILD UP.

Unusual Fire And Expl Hazrds: CLOSED CONTAINERS MAY EXPLODE DUE TO BUILDUP OF PRESSURE FROM EXTREME HEAT/FIRE.

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 Reactivity Data
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Stability: YES
 Cond To Avoid (Stability): HIGH TEMPS.
 Materials To Avoid: STRONG OXIDIZING AGENTS.
 Hazardous Decomp Products: CO, CO2.
 Hazardous Poly Occur: NO

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 Health Hazard Data
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LD50-LC50 Mixture: ORAL LD50 (RAT): 4300 MG/KG
 Route Of Entry - Inhalation: YES
 Route Of Entry - Skin: NO
 Route Of Entry - Ingestion: YES
 IRRITATION. INHALATION: ANESTHETIC, IRRITATION OF THE RESPIRATORY TRACT/
 NERVOUS DEPRESSION.
 Carcinogenicity - NTP: NO
 Carcinogenicity - IARC: NO
 Carcinogenicity - OSHA: NO
 Explanation Carcinogenicity: NONE
 Signs/Symptoms Of Overexp: DIZZINESS, NAUSEA, IRRITATION, BURNING
 SENSATION, HEADACHE, NAUSEA, UNCONSCIOUSNESS.
 Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR & RESTORE
 BREATHING. SKIN: WASH AREA. EYES: FLUSH W/WATER FOR 15 MINS. OBTAIN MEDICAL
 ATTENTION IN ALL CASES.

=====
 Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: REMOVE SOURCES OF IGNITION. VENTILATE AREA &
 SOAK UP W/INERT ABSORBENT USING NON-SPARKING TOOLS.
 Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.
 DON'T INCINERATE CLOSED CONTAINERS. UN1950.
 Precautions-Handling/Storing: DON'T STORE >120F. DON'T STORE/USE NEAR
 HEAT, SPARKS/FLAME.
 Other Precautions: DON'T GET IN EYES. DON'T BREATHE VAPORS. AVOID SKIN
 CONTACT. DON'T TAKE INTERNALLY. SMOKING IS PROHIBITED. DUST FROM SANDING
 THE DRY PAINT FILMS SHOULD BE TREATED AS A NUISANCE DUST W/A TLV OF 10MG/
 CM. AVOID PROLONGED/REPEATED CONTACT.

=====
 Control Measures
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Respiratory Protection: OUTDOORS, WE RECOMMEND AN APPROVED PARTICULITE
 FILTER TO REMOVE ANY AIRBORNE OVERSPRAY. IN RESTRICTED AREAS, A NIOSH
 APPROVED RESPIRATOR W/ORGANIC VAPOR CARTRIDGE IS RECOMMENDED.
 Ventilation: ADEQUATELY: IN ORDER TO KEEP BELOW EXPOSURE LIMITS.
 Protective Gloves: IMPERVIOUS/NATURAL RUBBER
 Eye Protection: SAFETY GLASSES W/SIDE SHIELDS
 Other Protective Equipment: IMPERVIOUS APRON, EYE WASH FOUNTAIN & SAFETY
 SHOWER.
 Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
 REUSE.

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 Transportation Data
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Disposal Data

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Label Data

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SHELL OIL COMPANY ENVIRONMENTAL AFFAIRS -- MULTI-PURPOSE LITHIUM EP GREASE 2, 7107C
MATERIAL SAFETY DATA SHEET
SHELL OIL COMPANY ENVIRONMENTAL AFFAIRS NSN: 915000N020257
Manufacturer's CAGE: 54527
Part No. Indicator: A
Part Number/Trade Name: MULTI-PURPOSE LITHIUM EP GREASE 2, 71070

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General Information
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Company's Name: SHELL OIL COMPANY ENVIRONMENTAL AFFAIRS
Company's P. O. Box: 4320
Company's City: HOUSTON
Company's State: TX
Company's Country: US
Company's Zip Code: 77210
Company's Emerg Ph #: 713-473-9461; 800-424-9300 (CHEMTREC)
Company's Info Ph #: 713-241-2552
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 03FEB88
Safety Data Review Date: 27JUL95
MSDS Serial Number: EMFBH
Hazard Characteristic Code: N1

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: HYDROTREATED HEAVY NAPHTHENIC DISTILLATE, PETROLEUM; (SOLVENT
REFINED, HYDROTREATED, PETROLEUM DISTILLATES).
Ingredient Sequence Number: 01
Percent: 55
NIOSH (RTECS) Number: PY8035000
CAS Number: 64742-52-5
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: SOLVENT REFINED HYDROTREATED RESIDUAL OILS; (SOLVENT REFINED,
HYDROTREATED, PETROLEUM DISTILLATES)
Ingredient Sequence Number: 02
Percent: 26
NIOSH (RTECS) Number: 1003242SR
CAS Number: 64742-57-0
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: LITHIUM 12 HYDROXYSTEARATE
Ingredient Sequence Number: 03
Percent: <10
NIOSH (RTECS) Number: 1002148LS
CAS Number: 7620-77-1
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: SULFURIZED FATTY MATERIAL; (SULFURIZED LARD OIL)
Ingredient Sequence Number: 04

Percent: 7
NIOSH (RTECS) Number: 1002957SF
CAS Number: 61790-49-6
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: NAPHTHENIC ACID, LEAD SALT
Ingredient Sequence Number: 05
Percent: 2.5
NIOSH (RTECS) Number: QK9150000
CAS Number: 61790-14-5
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: SUPP DATA:DAMAGE TO BONE MARROW (ANEMIA), NERV SYS (BRAIN & PERIPHERAL NERVE), KIDNEY & TOX OF BOWEL (COLIC).(ING 7)
Ingredient Sequence Number: 06
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 6:HANDLING PROCEDURES AND SAFETY PRECAUTIONS SHCULD BE FOLLOWED TO MINIMIZE EMPLOYEE EXPOSURE.
Ingredient Sequence Number: 07
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: FIRST AID PROC:GET MD.INGEST:DO NOT INDUCE VOMIT. IN GEN, NO TREATMENT NEC UNLESS LGE QYTS OF PROD INGESTED.(ING 9)
Ingredient Sequence Number: 08
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 8:BUT GET MD. NOTE TO MD:IN GEN, EMESIS INDUCTION UNNEC IN HIGH VISCOSITY,LOW VOLAT PRODS I.E., MOST OILS/GREASES.
Ingredient Sequence Number: 09
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: HAZ DECOMP PRODS:& GASES WILL EVOLVE WHEN MATL UNDERGOES PYROLYSIS OR COMBUST. CO & UNIDENTIFIED ORGANIC (ING 11)
Ingredient Sequence Number: 10
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 10:COMPOUNDS MAY BE FORMED UPON COMBUSTION.
Ingredient Sequence Number: 11
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: DARK BROWN, SMOOTH, SLIGHT ODOR
Solubility In Water: INSOLUBLE

Fire and Explosion Hazard Data

Flash Point: 430F, 221C
Flash Point Method: PMCC
Extinguishing Media: WATER FOG, DRY CHEM OR CO2. DO NOT USE A DIRECT
STREAM OF WATER. PRODUCT WILL FLOAT & CAN BE REIGNIT ON SURF OF H2O.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT (FP N). COOL FIRE EXPOSED CONTAINERS SURROUNDING
EQUIPMENT AND STRUCTURES WITH WATER.
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HEAT AND OPEN FLAME.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: THERMAL DECOMP PRODS ARE HIGHLY DEPENDENT ON
COMBUST CNDTNS. COMPLEX MIXTURE OF AIRBORNE SOLID, LIQ PARTICULATES (ING 10)
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

Health Hazard Data

LD50-LC50 Mixture: LD50: (ORAL RAT) >15 MG/KG.
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: EYE: MAY BE MILDLY IRRITATING. SKIN: PROLONGED
OR REPEATED CONTACT MAY CAUSE VARIOUS SKIN DISORDERS SUCH AS DERMATITIS,
FOLLICULITIS OR OIL ACNE. RELEASE DURING HIGH PRESSURE USAGE MAY RESULT IN
INJECTION OF OIL INTO THE SKIN CAUSING LOCAL NECROSIS. INHAL/INGEST: NO
SPECIFIC INFORMATION IDENTIFIED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT.
Signs/Symptoms Of Overexp: IRRIT AS NOTED. LOCAL NECROSIS IS EVIDENCED BY
DELAYED ONSET OF PAIN AND TISS DMG A FEW HOURS FOLLOWING INJECTION. PRODUCT
HAS NOT BEEN TESTED IN LONG-TERM, CHRONIC EXPOS TESTS. LUBRICATING GREASES
ARE GEN CONSIDERED TO BE OF LOW ORDER OF ACUTE TOX TO HUMANS & EXPERIMENTAL
ANIMALS. HOWEVER, HNDLG PROC & SAFETY (SUPDAT)
Med Cond Aggravated By Exp: PREEXISTING SKIN DISORDERS MAY BE AGGRAVATED
BY EXPOSURE TO THIS PRODUCT.
Emergency/First Aid Proc: EYE: FLUSH WITH WATER FOR AT LEAST 15 MINS WHILE
HOLDING EYELIDS OPEN. GET MD. SKIN: REMOVE CONTAM CLTHG & WIPE EXCESS OFF.
WASH W/SOAP & WATER OR WATERLESS HAND CLEANER FOLLOWED BY SOAP & WATER. DO
NOT REUSE CLTHG UNTIL THORO CLEANED. IF IRRIT PERISTS, GET MD. IF MATL
INJECTED UNDER SKIN, GET MD IMMED. DO NOT WAIT FOR SYMPS TO DEVELOP.
INHAL: REMOVE TO FRESH AIR & GIVE O2 IF BRTHG DFCLT. (SEE ING 8)

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: SCOOP UP EXCESS GREASE. CLEAN AREA WITH

APPROPRIATE CLEANER.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: DISPOSAL MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS (FP N).

Precautions-Handling/Storing: STORE IN COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES.

Other Precautions: MINIMIZE SKIN CONTACT. PROPERLY DISPOSE OF CONTAMINATED LEATHER ARTICLES, INCLUDING SHOES, THAT CANNOT BE DECONTAMINATED.

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Control Measures
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Respiratory Protection: NOT ORDINARILY REQUIRED. NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).

Ventilation: NONE SPECIFIED BY MANUFACTURER.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).

Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.

Work Hygienic Practices: WASH WITH SOAP & WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDRY CLOTHING BEFORE REUSE

Suppl. Safety & Health Data: EFTS OF OVEREXP:PRECS IN MSDS SHOULD BE FOLLOWED TO MINIMIZE EXPOSURE. NO REPORTS OF LEAD TOX HAVE BEEN ASSOC W/ PROD. HOWEVER, SKIN CONT MAY RESULT IN ABSORPTION OF LEAD INTO BLOOD STREAM WHICH POTENTIALLY COULD RESULT IN LEAD TOX OR ADVERSE REPROD EFTS. SUFFICIENT LEAD ABSORPTION IS KNOWN TO CAUSE (ING 6)

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Transportation Data
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Trans Data Review Date: 92111

DOT PSN Code: ZZZ

DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

IMO PSN Code: ZZZ

IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

IATA PSN Code: ZZZ

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

AFI PSN Code: ZZZ

AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Additional Trans Data: NOT REGULATED FOR TRANSPORTATION

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES

Label Status: G

Common Name: MULTI-PURPOSE LITHIUM EP GREASE 2, 71070

Special Hazard Precautions: EYE:MAY BE MILDLY IRRITATING. SKIN:PROLONGED OR REPEATED CONTACT MAY CAUSE VARIOUS SKIN DISORDERS SUCH AS DERMATITIS, FOLLICULITIS OR OIL ACNE. RELEASE DURING HIGH PRESSURE USAGE MAY RESULT IN INJECTION OF OIL INTO THE SKIN CAUSING LOCAL NECROSIS. INHAL/INGEST:NO SPECIFIC INFORMATION IDENTIFIED. IRRIT AS NOTED. LOCAL NECROSIS IS EVIDENCED BY DELAYED ONSET OF PAIN AND TISS DMG A FEW HOURS FOLLOWING

INJECTION. PRODUCT HAS NOT BEEN TESTED IN LONG-TERM, CHRONIC EXPOS TESTS. LUBRICATING GREASES ARE GEN CONSIDERED TO BE OF LOW ORDER OF ACUTE TOX TO HUMANS & EXPERIMENTAL ANIMALS. HOWEVER, HNDLG PROC & SAFETY (SUPDAT)

Label Name: SHELL OIL COMPANY ENVIRONMENTAL AFFAIRS

Label P.O. Box: 4320

Label City: HOUSTON

Label State: TX

Label Zip Code: 77210

Label Country: US

Label Emergency Number: 13-473-9461;800-424-9300 (CHEMTREC)

M A T E R I A L S A F E T Y D A T A S H E E T

DATE PREPARED: 11-15-1995

SUPERCEDES DOCUMENT PREPARED: 11-15-1995

SECTION I IDENTIFICATION DATA

057640

0003020

PRODUCT: NEVER SEEZ REGULAR GRADE

CHEMICAL FAMILY: Anti-Seize Compound(Mixture)

SECTION II HAZARDOUS INGREDIENTS

		% BY WEIGHT	TLV UNITS*
SYNTHETIC GRAPHITE		20-25%	5 mg/H3
	CAS Number	7782-42-5	
COPPER POWDER		5-10%	1 mg/H3
COPPER FLAKE POWDER	CAS Number *	7440-50-8	
ZINC OXIDE		1-5%	5 mg/H3
	CAS Number *	1314-13-2	
ALUMINUM FLAKE		1-5%	5 mg/H3
ALUMINUM	CAS Number *	7429-90-5	

* Numbers shown represent the lower of the U.S. OSHA PEL or ACGIH TLV Values
Common or trade names are shown on the line under the chemical name.

SECTION III PHYSICAL DATA

VAPOR PRESSURE IN MM HG	Not Available
BOILING POINT IN DEGS F	875 Degrees F
VAPOR DENSITY (AIR=1)	Not Available
SOLUBILITY IN WATER	0.1 %
EVAPORATION RATE	Not Available
SPECIFIC GRAVITY	1.21
	10.13 Pounds per Gallon
PERCENT VOLATILE BY WEIGHT	0.0
VOLUME	0.0
APPEARANCE AND ODOR	A silvery gray anti seize with a greasy like odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA -

FLASH POINT 482 Degrees F Open Cup
LOWER EXPLOSIVE LIMIT Not Available
UPPER EXPLOSIVE LIMIT Not Available
AUTOIGNITION POINT (VAPORS) Not Available
AUTOIGNITION POINT (SOLIDS) 875 Degrees F
SPECIAL FIREFIGHTING PROCEDURES AND
UNUSUAL FIRE AND EXPLOSION HAZARDS None known to BOSTIK.
EXTINGUISHING MEDIA Water spray, foam, dry chemical, carbon dioxide.

SECTION V HEALTH HAZARD DATA -

The information shown below refers generally to a component of the product but as required by OSHA 1910.1200 the hazards of any ingredient must be extended to the product as a whole unless testing of the product has been performed. The U.S. American National Standard (ANSI) Z129.1-1982 was used as a guide when this MSDS was written.

INGESTION No hazard known at this time.
ABSORPTION No hazard known at this time.
INHALATION Hazardous if inhaled. Ingredient has an LC50 of 1500-2500 ppm or 500-2500 mg/M3 or is regulated by a TLV or PEL.
CONTACT Ingredient causes eye and/or skin irritation.
CORROSION No hazard known at this time.
FLAMMABILITY Contains a flammable solid.

FIRST AID:

INHALATION If inhaled remove to fresh air. If not breathing give artificial respiration, preferably mouth to mouth. If breathing is difficult give oxygen. Call a physician.

CONTACT In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

IN CASE OF FIRE USE EXTINGUISHING AGENTS RECOMMENDED.

SYMPTOMS OF OVEREXPOSURE Irritation. Dry Throat. Mucous Membrane Irritation

SECTION V HEALTH HAZARD DATA (CONT.)

Weakness, Coughing, Nausea, Fever.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE Asthma, Respiratory Disease.
ENTRY ROUTE Contact, inhalation.
CHRONIC EFFECTS Long term overexposure to the hazardous materials in this product have been associated with Dermatitis, Emphysema, Pulmonary Fibrosis.
TARGET ORGANS Eyes, Kidneys, Liver, Respiratory System, Skin, Lung.

NONE OF THE INGREDIENTS IN THIS PRODUCT EXCEEDING A CONCENTRATION LIMIT OF 0.1% ARE ON THE IARC, NTP, OR OSHA LISTS OF CARCINOGENIC HAZARDS

SECTION VI REACTIVITY DATA

STABILITY Stable
MATERIALS TO AVOID Strong Mineral Acids, Magnesium.
HAZARDOUS DECOMPOSITION PRODUCTS
Unknown due to the complex nature of this material. Fumes from complete or incomplete combustion of this material may include carbon dioxide, carbon monoxide, water vapor, oxides of nitrogen or a wide variety of innocuous or toxic fumes.
HAZARDOUS POLYMERIZATION Will not occur.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN WHEN MATERIAL IS SPILLED OR RELEASED
If liquid, soak up with absorbent material such as sand, earth, sweeping compound or some other absorbent material. Package absorbent material or solid product in steel drums which are in good condition.
Thoroughly clean area where spill occurred.
WASTE DISPOSAL METHOD Dispose of in accordance with federal, state, and local rules. Be aware that state and local requirements may differ widely depending on location and may in many cases be different from federal rules. When intending to dispose of this material, the user is advised that this product would not be classified as a Hazardous Waste under U.S. Federal

- SECTION VII SPILL OR LEAK PROCEDURES (CONT.) -

Regulations in effect at the time this MSDS was created.

- SECTION VIII SPECIAL PROTECTION INFORMATION -

VENTILATION Not normally required.
PROTECTIVE GLOVES Cloth.
EYE PROTECTION Safety glasses are recommended.
OTHER PROTECTION Safety shower and eye bath.

- SECTION IX SPECIAL PRECAUTIONS -

PRECAUTIONS FOR HANDLING AND STORING

Store in a cool location (60-80 degrees F) away from sunlight and any source of heat. Keep container tightly closed when not being used.

OTHER PRECAUTIONS

Use with adequate ventilation, avoid prolonged or repeated breathing of vapors. Avoid skin contact.

- IMPORTANT NOTICE SECTION -

REGULATORY DATA

CALIFORNIA PROPOSITION 65

INGREDIENTS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER

QUARTZ (14808-60-7)
LEAD (7439-92-1)

INGREDIENTS KNOWN TO THE STATE OF CALIFORNIA TO BE REPRODUCTIVE TOXINS

LEAD (7439-92-1)

IMPORTANT NOTICE: All statements, technical information and recommendations set forth herein are based on information or tests which BOSTIK, INC. believes to be reliable. However, BOSTIK cannot guarantee their accuracy or completeness. The buyer should conduct his own tests of this product before use.

IMPORTANT NOTICE SECTION (CONT.)

determine proper preparation technique and suitability for the proposed application. BOSTIK's sale of this product is limited to the terms and conditions set forth on BOSTIK's order acknowledgement.

To summarize, BOSTIK's only warranty is that the product conforms with its written specifications, and is free from defects under normal usage; and BOSTIK's only obligation for non-compliance with this warranty is to replace the product or refund the buyer's purchase price. BOSTIK DISCLAIMS THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. In no case will BOSTIK be liable for direct, consequential, economic or other damages, except for the replacement or refund as set forth above.

ADDITIONAL NOTICE: This MSDS meets the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR 372. If any toxic chemical (Subpart D of Part 372, Section 372.65) is present in this product in excess of the de minimus concentrations listed in Subpart B of Part 372, Section 372.38, its identity, CAS Registry number and concentration by weight will be found in Section I of this MSDS under Hazardous Ingredients.

In case of emergency, call 1-800-227-0332.

PREPARED BY: R.E.Hardenbe 11-15-1995
Supercedes MSDS prepared: 11-15-1995

Nitrogen Material Safety Data Sheet

Industrial Gas Division
Air Products and Chemicals, Inc.
Allentown, PA 18195
Tel. (215) 481-4911 · TWX 510-651-3686
Telecopy (215) 481-5900
CABLE-AIRPROD · TELEX 847416

AIR PRODUCTS

EMERGENCY PHONE: 800—523-9374		IN PENNSYLVANIA: 800—322-9092	
ISSUE DATE	Issued: 13 April 1977	TRADE NAME AND SYNONYMS	CHEMICAL NAME AND SYNONYMS
REVISIONS	Rev: 1 June 1990	Nitrogen, or LIN (in cryogenic liquid state)	Nitrogen
		FORMULA	CHEMICAL FAMILY
		N ₂ MW: 28.01	Inert gas CAS #7727-37-9

HEALTH HAZARD DATA

EXPOSURE LIMITS

OSHA: None established. ACGIH: Simple Asphyxiant. Nitrogen is not listed as a carcinogen by NTP, IARC, or OSHA.

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED

Nitrogen is odorless and nontoxic, but may produce suffocation by diluting the concentration of oxygen in air below levels necessary to support life. PERSONNEL, INCLUDING RESCUE WORKERS, SHOULD NOT ENTER AREAS WHERE THE OXYGEN CONCENTRATION IS BELOW 19.5% UNLESS PROVIDED WITH A SELF-CONTAINED BREATHING APPARATUS OR AIRLINE RESPIRATOR. Exposure to oxygen-deficient atmospheres may produce dizziness, nausea, vomiting, loss of consciousness, and death. Death may result from errors in judgement, confusion, or loss of consciousness which prevents self-rescue. At low oxygen concentrations unconsciousness and death may occur in seconds without warning. Extensive tissue damage or burns can result from exposure to liquid nitrogen or cold nitrogen vapors.

TOXICOLOGICAL PROPERTIES

Nitrogen is a simple asphyxiant and constitutes 78% of the air we breathe. Nitrogen does not support life and may produce immediate hazardous atmospheres through the displacement of oxygen. Nitrogen under high pressure can produce narcosis even though oxygen sufficient for life is present.

RECOMMENDED FIRST AID TREATMENT

Persons suffering from lack of oxygen should be moved to areas with normal atmospheres. SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED TO PREVENT ASPHYXIATION OF RESCUE WORKERS. Assisted respiration and supplemental oxygen should be given if the victim is not breathing. If cryogenic liquid or cold boil-off gas contacts a worker's skin or eyes, frozen tissue should be flooded or soaked with tepid water (105-115F; 41-46C). DO NOT USE HOT WATER. Cryogenic burns which result in blistering or deeper tissue freezing should be seen promptly by a physician.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	AUTO IGNITION TEMP	FLAMMABLE LIMITS	LEL	UEL
N/A	N/A	Non-flammable	N/A	N/A
EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION			
N/A	GROUP N/A			
SPECIAL FIRE FIGHTING PROCEDURES				
N/A				

UNUSUAL FIRE AND EXPLOSION HAZARDS

Cylinders exposed to high heat or flame may vent rapidly.

PHYSICAL DATA

BOILING POINT (°F)		FREEZING POINT (°F)	
@ 1 atm -320.5F (-195.8C)		@ 1 atm -346.0F (-210.0C)	
VAPOR PRESSURE (psia)		SOLUBILITY IN WATER	
N/A		@ 68F (20C), 1 atm 1.52% by volume	
VAPOR DENSITY (lb/cu ft)	SPECIFIC GRAVITY (AIR = 1)	LIQUID DENSITY (lb/cu ft)	SPECIFIC GRAVITY (H ₂ O = 1)
@ 70F (21.1C), 1 atm 0.07245	@ 68F (20C), 1 atm 0.967	@ boiling point, 1 atm 50.47	@ boiling point, 1 atm 0.808

APPEARANCE AND ODOR

Both liquid and gaseous nitrogen are colorless and odorless.

REACTIVITY DATA

STABILITY Inert	UNSTABLE		CONDITIONS TO AVOID None
	STABLE	X	

COMPATIBILITY (Materials to avoid)
None

HAZARDOUS DECOMPOSITION PRODUCTS
None

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID None
	WILL NOT OCCUR	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
 Avoid contact of skin with liquid nitrogen or its cold boil-off gas. Flush liquid nitrogen spill with water to disperse. Ventilate enclosed areas to prevent formation of oxygen-deficient atmospheres caused by the evaporation of liquid nitrogen or the release of gaseous nitrogen.

WASTE DISPOSAL METHOD
 Allow liquid nitrogen to evaporate in a well ventilated outdoor location remote from work areas. Vent nitrogen gas slowly to a well ventilated outdoor location remote from work areas. Do not attempt to dispose of residual nitrogen in compressed gas cylinders. Return cylinders to Air Products with residual pressure, the cylinder valve tightly closed and valve caps in place.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)
 Use self-contained breathing apparatus in oxygen-deficient atmospheres. Caution! Respirators will not function. Use may result in asphyxiation.

VENTILATION Natural or mechanical where gas is present.	LOCAL EXHAUST As necessary	SPECIAL As necessary
	MECHANICAL (General) As necessary	OTHER Vents should be situated to avoid higher than normal concentration of nitrogen in work areas.

PROTECTIVE GLOVES
 (LIN) Loose-fitting gloves of impermeable materials such as leather. Leather work gloves are recommended when handling compressed gas cylinders.

EYE PROTECTION
 (LIN) Chemical goggles or safety glasses. Safety glasses are recommended when handling high-pressure cylinders.

OTHER PROTECTIVE EQUIPMENT
 None

SPECIAL PRECAUTIONS *

ADDITIONAL LABELING INFORMATION
 DOT Shipping Name: Nitrogen or Nitrogen, Compressed; (LIN) Nitrogen, refrigerated liquid.
 DOT Hazard Class: Nonflammable Gas.
 DOT Shipping Label: Nonflammable Gas.
 I.D. Number: UN 1066 (Nitrogen or Nitrogen, Compressed); UN 1977 (LIN).

SPECIAL HANDLING RECOMMENDATIONS
 Prevent contact of liquid nitrogen or cold boil-off gas with exposed skin. Prevent entrapment of liquid in closed systems. Use only in well ventilated areas. Compressed gas cylinders contain nitrogen at extremely high pressure and should be handled with care. Use a pressure-reducing regulator and pressure relief devices when connecting to lower pressure piping systems. Secure cylinders when in use. Never use direct flame to heat a compressed gas cylinder. Use a check valve to prevent back flow into storage container. Avoid dragging, rolling, or sliding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compressed gas cylinders, consult Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS
 It is recommended that liquid cylinders be stored outside and the gas or liquid piped to the use point. However, if liquid cylinders are to be stored or transported in an enclosed area, it is essential that the area be well ventilated. In case of poor natural ventilation, forced ventilation should be installed. Keep cylinders away from sources of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Storage areas should be free of combustible material. Replace the cylinder cap when the cylinder is not in use. Avoid exposure to areas where salt or other corrosive chemicals are present. See Compressed Gas Association Pamphlet P-1 for additional storage recommendations.

SPECIAL PACKAGING RECOMMENDATIONS
 Gaseous nitrogen containers meet DOT specifications or American Society of Mechanical Engineers (ASME) codes. Liquid nitrogen is stored in vacuum-insulated containers meeting DOT specifications or ASME codes.

OTHER RECOMMENDATIONS OR PRECAUTIONS
 Liquid nitrogen is a cryogenic liquid. Materials of construction must be selected for compatibility with extremely low temperatures. Avoid use of carbon steel and other materials which become brittle at low temperatures. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder filled without the written permission of the owner is a violation of Federal Law. If oxygen-deficient atmospheres are suspected or can occur, use oxygen monitoring equipment to test for oxygen deficient atmospheres.

U.S. Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that s/he is in full compliance.



IDENTITY (As Used on Label and List)
 Organic bonded high-speed cut-off wheels

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name August Rüggeberg	Emergency Telephone Number 02264 - 91
Address (Number, Street, City, State, and ZIP Code) Hauptstr. 13	Telephone Number for Information S. A.
D-5277 Marienheide	Date Prepared Revised March 1, 1990
	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identify Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL ³	ACGIH TLV ⁴	Other Limits Recommended
Alpha-Alumina Alundum 1344-28-1	15 mg/m ³ total dust	10 mg/m ³ total dust	-
impurities (TiO ₂ + SiO ₂ + Fe ₂ O ₃)			
Silicon Carbide Carbores 13463-67-7	15 mg/m ³	10 mg/m ³	-
Zirconia oxide Zirconia N/A	5 mg/m ³	5 mg/m ³	-

The grinding wheel may be comprised of 1 or more of the above abrasives. The chemicals listed below may be a part of the bond system.

Fluorides (as F) Cryolite N/A	2,5 mg/m ³	2,5 mg/m ³	-
Iron disulphide Pyrites 12068-85-8	N/A	N/A	-
Barium sulfate Barytes 7727-43-7	5 mg/m ³	5 mg/m ³	-
Glass, fibrous Fiberglass N/A	N/A	N/A	-
Furfural)* Furfurol 98-01-1	N/A	N/A	-
Cresol)* 1319-77-3	N/A	N/A	-

Section III — Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H₂O = 1)	2.4 - 2.8
Vapor Pressure (mm Hg.)	N/E	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A

Solubility in Water insoluble
Appearance and Odor dark brown, no odor

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used) 1800° F	Flammable Limits	LEL N/A	UEL N/A
Extinguishing Media CO ₂ Foam or water			
Special Fire Fighting Procedures none			

Additional Fire and Explosion Hazards
 none

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	N/A
I. Incompatibility (Materials to Avoid) N/A			
F. Hazardous Decomposition or Byproducts N/A			
Hazardous Polymerization	May Occur		Conditions to Avoid N/A
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation? <input checked="" type="checkbox"/>	Skin? <input type="checkbox"/>	Ingestion? <input type="checkbox"/>
During grinding			
Health Hazards (Acute and Chronic)	coughing, shortness of breath, may effect breathing capacity	some may experience skin irritation from dust	not known, ingestion not recommended
Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?

Signs and Symptoms of Exposure: s. a.

Medical Conditions Generally Aggravated by Exposure: obtain medical assistance

Emergency and First Aid Procedures: remove to fresh air, artificial respiration as needed, wash affected areas with soap and water

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled: normal clean up procedures

Waste Disposal Method: Standard landfill methods consistent with applicable FEDERAL, STATE and LOCAL LAWS, Products with listed fluorides may have slightly soluble fluoride swarf.

Precautions to Be Taken in Handling and Storing: Handle with adequate ventilation. See OSHA 29CFR1910.94 (Ventilation) and 29CFR18100.1000 (Air contaminates). Sec ANSI STANDARD B 7.1.

Other Precautions: none

Section VIII — Control Measures

Respiratory Protection (Specify Type) As needed. For approved dust respirators see OSH 29CFR1910.134			
Ventilation	Local Exhaust	Recommended	Special N/A
	Mechanical (General)	Recommended	Other N/A
Protective Gloves	as desired by user		Eye Protection Recommended see OSHA 29CFR1910.133
Protective Clothing or Equipment: needed hearing protection see OSHA 29CFR1910.215 (Hearing protection)			
Work/Hygienic Practices: N/A			

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072



IDENTITY (As Used on Label and List)
Rubber bonded mounted-points

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name August Rüggeberg	Emergency Telephone Number - 02264 - 91
Address (Number, Street, City, State, and ZIP Code) Hauptstr. 13	Telephone Number for Information S. a.
D -5277 Marienheide	Date Prepared 5/15/86
	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended
Butadiene - 106-99-0	N/A	N/A	-
Sulfur Sulfur 7704-34-9	N/A	N/A	-
Zinc oxide - 1314-13-2	5 mg/m ³	5 mg/m ³	-
Alpha-Alumina Alundum 1344-28-1	15 mg/m ³	10 mg/m ³	-
impurities (TiO ₂ + SiO ₂ + Fe ₂ O ₃)			

Section III — Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H ₂ O = 1)	2.3
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A
Solubility in Water	N/A		
Appearance and Odor	red, no odor perhaps in use		

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	N/A	Flammable Limits	LEL N/A	UEL N/A
Extinguishing Media	CO ₂ Foam or water			
Special Fire Fighting Procedures	none			
Unusual Fire and Explosion Hazards	none			



IDENTITY (As Used on Label and List)
 Ceramic bonded grinding wheels

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I	
Manufacturer's Name August Rüggeberg	Emergency Telephone Number 02264 - 91
Address (Number, Street, City, State, and ZIP Code) Hauptstr. 13 D-5277 Marienheide	Telephone Number for Information S. 2. Date Prepared Revised March 1, 1990 Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended
Alpha-Alumina Alundum 1344-28-1	15 mg/m ³ total dust	10 mg/m ³ total dust	-
Impurities (TiO ₂ + SiO ₂ + Fe ₂ O ₃)			
Silicon Carbide Carboron 13463-67-7	15 mg/m ³	10 mg/m ³	-
Zirconia Oxide Zirconia N/A	5 mg/m ³	5 mg/m ³	-

The grinding wheel may be comprised of 1 or more of the above abrasives. The chemicals listed below may be a part of the bond system.

Fluorides (as F) Cryolite N/A	2,5 mg/m ³	2,5 mg/m ³	-
Iron disulphide Pyrites 12068-85-8	N/A	N/A	-
Fibers, fibrous Fiberglass N/A	N/A	N/A	-
Furfural)* Furfurol 98-01-1	N/A	N/A	-
Cresol)* 1319-77-3	N/A	N/A	-

Section III — Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H ₂ O = 1)	2.4 - 2.8
Vapor Pressure (mm Hg.)	N/E	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A
Solubility in Water	insoluble		
Appearance and Odor	dark brown, no odor		

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	1800° F	Flammable Limits	LEL N/A	UEL N/A
Extinguishing Media	CO ₂ Foam or water			
Special Fire Fighting Procedures	none			
Fire and Explosion Hazards	none			

May be completely absent from finished product

Stability:	Unstable		Conditions to Avoid
	Stable	X	N/A
Incompatibility (Materials to Avoid)			N/A
Hazardous Decomposition or Byproducts			N/A
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	N/A

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation? ←	During Grinding ^{Skin?}	→ Ingestion?
Health Hazards (Acute and Chronic)	coughing, shortness of breath, may effect breathing capacity	some may experience skin irritation from dust	not known, ingestion not recommended
Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?

Signs and Symptoms of Exposure
s.a.

Medical Conditions Generally Aggravated by Exposure
obtain medical assistance

Emergency and First Aid Procedures
remove to fresh air, artificial respiration as needed, wash affected areas with soap and water

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled
normal clean up procedures

Waste Disposal Method
Standard landfill methods consistent with applicable FEDERAL, STATE and LOCAL LAWS, Products with listed fluorides may have slightly soluble fluoride swarf.

Precautions to Be Taken in Handling and Storage
Handle with adequate ventilation. See OSHA 29CFR1910.94 (Ventilation) and 29CFR18100.1000 (Air contaminates). Sec ANSI STANDARD B 7.1.

Other Precautions
none

Section VIII — Control Measures

Respiratory Protection (Specify Type)
As needed. For approved dust respirators see OSHA 29CFR1910.134

Ventilation	Local Exhaust	Recommended	Special	N/A
	Mechanical (General)	Recommended	Other	N/A

Protective Gloves as desired by user Eye Protection Recommended see OSHA 29CFR1910.116

Other Protective Clothing or Equipment
As needed hearing protection see OSHA 29CFR1910.215 (Hearing protection)

Hygienic Practices
N/A

Material Safety Data Sheet

May be used to comply with
 OSHA's Hazard Communication Standard,
 29 CFR 1910.1200. Standard must be
 consulted for specific requirements.

U.S. Department of Labor

Occupational Safety and Health Administration
 (Non-Mandatory Form)
 Form Approved
 OMB No. 1218-0072



ENTITY (As Used on Label and List):
 Vitriified bonded abrasives

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name August Rüggeberg	Emergency Telephone Number 02264 - 91
Address (Number, Street, City, State, and ZIP Code) Hauptstr. 13	Telephone Number for Information S. a.
D-5277 Marienheide	Date Prepared Revised March 1, 1990
	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended
Alpha-Alumina Alundum 1344-28-1	15 mg/m ³	10 mg/m ³	
impurities (TiO ₂ + Fe ₂ O ₃ + SiO ₂)			
Silicon Carbide ² Carboron ² 409-21-2	15 mg/m ³	10 mg/m ³	

Section III — Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H₂O = 1)	2.4 - 2.6
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A
Solubility in Water	different colors, no odor		
Appearance and Odor			

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used)	N/A	Flammable Limits	LEL N/A	UEL N/A
Extinguishing Media	N/A			
Special Fire Fighting Procedures	N/A			
Unusual Fire and Explosion Hazards	N/A			

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	N/A
Incompatibility (Materials to Avoid)			N/A
Hazardous Decomposition or Byproducts			N/A
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	N/A

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation?	During grinding	Skin?	Ingestion?
Health Hazards (Acute and Chronic)	coughing, shortness of breath, may effect breathing capacity	some may experience skin irritation from dust		not known, ingestion not recommended
Carcinogenicity:	NTP?	IARC Monographs?		OSHA Regulated?

Signs and Symptoms of Exposure s. a.

Medical Conditions Generally Aggravated by Exposure obtain medical assistance

Emergency and First Aid Procedures remove to fresh air, artificial respiration as needed, wash affected areas with soap and water

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled normal clean up procedures

Waste Disposal Method Standard landfill methods consistent with applicable FEDERAL, STATE and LOCAL LAWS, Products with listed fluorides may have slightly soluble fluoride swarf.

Precautions to Be Taken in Handling and Storing Handle with adequate ventilation. See OSHA 29CFR1910.94 (Ventilation) and 29CFR18100.1000 (Air contaminates). Sec ANSI STANDARD B 7.1.

Other Precautions none

Section VIII — Control Measures

Respiratory Protection (Specify Type) As needed. For approved dust respirators see OSH 29CFR1910.134

Ventilation	Local Exhaust	Recommended	Special	N/A
	Mechanical (General)	Recommended	Other	N/A
Protective Gloves	as desired by user		Eye Protection	Recommended see OSHA 29CFR1910.134

Other Protective Clothing or Equipment hearing protection see OSHA 29CFR1910.215 (Hearing protection)

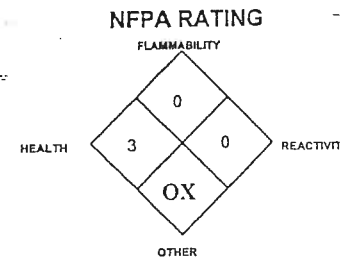
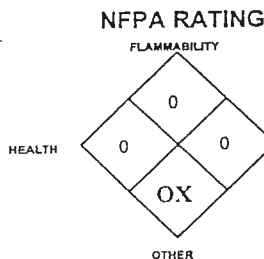
Work/Hygienic Practices N/A



MATERIAL SAFETY DATA SHEET

OXYGEN GAS

OXYGEN-REFRIGERATED LIQUID



Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

CHEMICAL NAME: CLASS:

OXYGEN O₂
OXYGEN O₂
REFRIGERATED LIQUID

Document Number: 001043

For general analytical/synthetic chemical uses.

PRODUCT USE:

SUPPLIER/MANUFACTURER'S NAME:

AIRGAS INC.

ADDRESS:

259 N. Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283

BUSINESS PHONE:

1-610-687-5253

EMERGENCY PHONE:

CHEMTREC: 1-800-424-9300

International: 703-527-3887 (Call Collect)

DATE OF PREPARATION:

May 20, 1996

THIRD REVISION:

April 5, 2000

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	
Oxygen	7782-44-7	99.0%	There are no specific exposure limits for Oxygen. Oxygen levels should be maintained above 19.5% and below 23.5%					
Maximum Impurities		1	None of the trace impurities in this mixture contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

NE = Not Established

C = Ceiling Limit.



See Section 16 for Definitions of Terms Used.

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.



3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Oxygen is a colorless, odorless, oxidizing gas, or a colorless, odorless, cryogenic liquid. The chief health hazard presented by this gas at atmospheric pressures is respiratory system irritation after overexposure to high oxygen concentrations. The main physical hazard associated with releases of this gas is related to its oxidizing power. In high oxygen content atmospheres, common combustible materials can become highly flammable. The cryogenic liquid will rapidly boil to the gas at standard temperatures and pressures. The liquefied gas can cause frostbite to any contaminated tissue. Emergency responders must practice extreme caution when approaching oxygen releases because of the extreme fire potential.

OXYGEN GAS

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH	(BLUE)	0	
FLAMMABILITY	(RED)	0	
REACTIVITY	(YELLOW)	0	
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

LIQUID OXYGEN

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH	(BLUE)	3	
FLAMMABILITY	(RED)	0	
REACTIVITY	(YELLOW)	0	
PROTECTIVE EQUIPMENT			X
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

See Section 16 for Definition of Ratings

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant route of overexposure for this gas or cryogenic liquid by inhalation. Skin and eye contact is also possible for the cryogenic liquid. The following paragraphs describe symptoms of exposure by route of exposure.

INHALATION: Normally, air contains 21% oxygen. No health effects have been observed in people exposed to 50% Oxygen at 1 atm. for 24 hours or longer. High concentrations of this gas create an oxygen-rich environment. Individuals breathing such an atmosphere containing 51-100% Oxygen may experience nausea, dizziness, coughing, and bronchial irritation. Exposures to high Oxygen concentrations, especially at elevated pressures, can cause, hypothermia, increased depth of respiration, bradycardia, pulmonary discomfort, central nervous system effects (e.g., mood changes, dizziness), peripheral vasoconstriction, amblyopia (loss of vision), seizures, or death. Exposure levels to pure oxygen which have produced the adverse symptoms described above are summarized below.

DURATION OF EXPOSURE

5 hours
3 hours
30 minutes
5 minutes

PRESSURE OF OXYGEN

Sea level
3 atmospheres
4 atmospheres
7 atmospheres

NOTE: Pure oxygen at 1/3 atmospheric pressure can be inhaled for weeks without symptoms. Inhalation of pure oxygen for up to 16 hours per day for many days and 65% oxygen in air for extended periods does not cause symptoms of oxygen toxicity.

OTHER POTENTIAL HEALTH EFFECTS: Contact of the skin or eyes with cryogenic liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside. Ingestion and absorption through the skin are not considered significant routes of entry of oxygen into the body.

3. HAZARD IDENTIFICATION (Continued)

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Overexposure to Oxygen may cause the following health effects:

ACUTE: The most significant hazard associated with this gas is inhalation of oxygen-rich atmospheres. Symptoms of overexposure to Oxygen include nausea, dizziness, respiratory problems, lowering of body temperature, loss of vision, seizures, or death. Contact with cryogenic liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite.

CHRONIC: Long-term exposure to high atmospheric concentrations of oxygen at normal pressure or elevated pressure may produce severe thickening and scarring of lung tissues. Blood hemoglobin concentration decreases (thus reducing oxygen-carrying capacity) with prolonged exposure to high concentrations. See Section 11 (Toxicological Information) for additional information.

TARGET ORGANS: Hyperbaric Oxygen: Respiratory system and Central Nervous System. Cryogenic Liquid: Skin.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO OXYGEN WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus Personal Protective equipment (and fire retardant clothing, if appropriate) should be worn to protect against high oxygen content or super-heated gases in the event of fire.

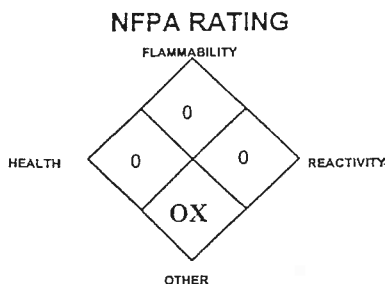
Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Supplemental oxygen is not normally appropriate. Victims tend to recover rapidly, when removed from the hypoxic exposure.

In case of frostbite, place the frostbitten part in warm water. **DO NOT USE HOT WATER.** If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.

Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s). Medical care providers should refer to Section 11 of this MSDS for additional information.

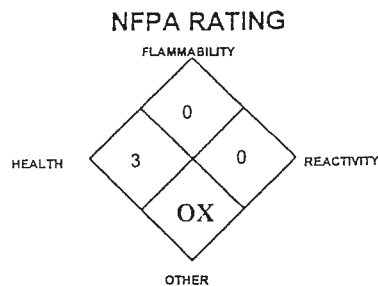
5. FIRE-FIGHTING MEASURES

OXYGEN GAS



See Section 16 for Definition of Ratings

LIQUID OXYGEN



FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

5. FIRE-FIGHTING MEASURES (Continued)

FIRE EXTINGUISHING MATERIALS: Non-flammable gas. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxygen does not burn; however, cylinders, when involved in fire, may rupture or burst in the heat of the fire. Oxygen will support and accelerate combustion. Common combustible materials will burn readily in elevated oxygen environments.

Water Spray: YES
Halon: YES

Carbon Dioxide: YES
Dry Chemical: YES

Foam: YES
Other: Any "ABC" Class.

RESPONSE TO FIRE INVOLVING CRYOGEN: Cryogenic oxygen may contribute to the ignition of any combustible material, including asphalt and wood. Extreme caution must be used when cryogenic oxygen storage vessels are involved in a fire. Cryogenic liquids can be particularly dangerous during fires because of their potential to rapidly freeze water. Careless use of water may cause heavy icing. Furthermore, relatively warm water greatly increases the evaporation rate of Oxygen. If large concentrations of Oxygen gas are present, the water vapor in the surrounding air will condense, creating a dense fog that may make it difficult to find fire exits or equipment. Liquid Oxygen, when exposed to the atmosphere, will produce a cloud of ice/fog in the air upon its release.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Not Sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Do not enter areas which have more than 23.5% oxygen in the atmosphere, since a serious fire and explosion hazard exists. Remove all flammable and combustible materials from vicinity of a release, if it can be done without risk to firefighters. Direct water onto vessels to keep the vessels cool. Shut-off the flow of oxygen or move vessels from fire area if it can be done safely. Withdraw from the area in case of rising sounds from venting safety devices or any discoloration of vessels due to fire.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area and protect people. Minimum Personal Protective Equipment should be Level B: fire protective clothing, mechanically-resistant, fire protective gloves and Self-Contained Breathing Apparatus. In general, DO NOT ENTER AN AREA IF THE OXYGEN CONTENT EXCEEDS 23.5%. USE VENTILATION TO REDUCE THE OXYGEN LEVELS. Locate and seal the source of the leaking gas. Protect personnel attempting the shut-off with water-spray. Allow the gas to dissipate. Monitor the surrounding area for oxygen levels. The atmosphere must have at least 19.5 percent and less than 23.5% oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

RESPONSE TO CRYOGENIC RELEASE: Clear the affected area and allow the liquid to evaporate and the gas to dissipate. After the gas is formed, follow the instructions provided in the previous paragraph. If the area must be entered by emergency personnel, SCBA, Kevlar gloves, and appropriate foot and leg protection and fire protective clothing must be worn.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: Do not eat or drink while handling chemicals. Be aware of any signs of overexposure to this gas (see Section 3, Hazard Information).

STORAGE AND HANDLING PRACTICES: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Post "No Smoking or Open Flames" signs in storage or use areas.

7. HANDLING and STORAGE (Continued)

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated, fireproof area, away from flammable materials and corrosive atmospheres. Store away from heat and ignition sources and out of direct sunlight. Do not store near elevators, corridors or loading docks. Do not allow area where cylinders are stored to exceed 52°C (125°F). Use only storage containers and equipment (pipes, valves, fittings to relieve pressure, etc.) designed for the storage of Oxygen. Do not store containers where they can come into contact with moisture.

Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting.

Keep Dewar flasks of liquid oxygen covered with loose fitting cap. This prevents air or moisture from entering the container, yet allows pressure to escape. Use only the stopper or plug supplied with the container. Ensure that ice does not form in the neck of flasks. If the neck of Dewar flask is blocked by ice or "frozen" air, follow owner's instruction for removing it. A plugged Dewar or storage flask may develop sufficient pressure to cause catastrophic failure. Ice can also cause pressure release valves to fail. Never tamper with pressure relief devices in valves and cylinders. The temperature of Liquid Oxygen is sufficiently cold to condense and freeze most gases. Consequently, there is a danger of pipes or vents becoming plugged. Liquid Oxygen should therefore be stored and handled under positive pressure or in a closed system to prevent the infiltration and solidification of air or other gases. The following rules are applicable to situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand-truck. Do not drag, slide or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap, if provided, in-place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap, if provided. Mark empty cylinders "EMPTY".

NOTE: Use only DOT or ASME code containers. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. For cryogenic liquids, refer to CGA P-12, *Safe Handling of Cryogenic Liquids*. Additionally, refer to CGA Bulletins G-4.3, "Commodity Specification for Oxygen", and G-4.1 "Cleaning Equipment for Oxygen Service".

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (e.g., Nitrogen) before attempting repairs.

TANK CAR SHIPMENTS: Tank cars carrying Oxygen should be loaded and unloaded in strict accordance with tank-car owner's recommendations and all established on-site safety procedures. Appropriate personal protective equipment must be used during tank car operations (see Section 8). All loading and unloading equipment must be inspected, prior to each use. Loading and unloading operations must be attended, at all times. Tank cars must be level and wheels must be locked or blocked prior to loading or unloading. Tank car (for loading) or storage tank (for unloading) must be verified to be correct for receiving this product and be properly prepared, prior to starting the transfer operations. Hoses must be verified to be clean and free of incompatible chemicals, prior to connection to the tank car or vessel. Valves and hoses must be verified to be in the correct positions, before starting transfer operations. A sample (if required) must be taken and verified (if required) prior to starting transfer operations. All lines must be blown-down and purged before disconnecting them from the tank car or vessel. Refrigerated Liquid Oxygen is capable of causing the ignition of asphalt. Transfers should be performed on concrete surfaces.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to maintain Oxygen levels between 19.5% and 23.5% in the work area. Local exhaust ventilation is preferred, because it prevents Oxygen dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of Oxygen.

8. EXPOSURE CONTROLS - PERSONAL (Continued)

RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% and below 23.5% in the workplace. Use supplied air respiratory protection during emergency response to a release of Oxygen. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standards. **DO NOT ENTER AN AREA IF THE OXYGEN CONTENT EXCEEDS 23.5%.**

EYE PROTECTION: Safety glasses. Face-shields must be worn when using cryogenic Oxygen.

HAND PROTECTION: Wear mechanically-resistant gloves when handling cylinders of Oxygen. Use low-temperature protective gloves (e.g., Kevlar) when working with containers of Liquid Oxygen.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well provide sufficient insulation from extreme cold.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY: 1.326 kg/m³ (0.083 lb/ft³)

SPECIFIC GRAVITY (air = 1): 1.105

SOLUBILITY IN WATER v/v @ 0°C (32°F): 4.9%

VAPOR PRESSURE (psia): Not applicable.

EXPANSION RATIO: 861 (cryogenic liquid).

COEFFICIENT WATER/OIL DISTRIBUTION: Log P -0.65

EVAPORATION RATE (nBuAc = 1): Not applicable.

FREEZING POINT: -218.8°C (-361.8°F)

BOILING POINT @ 1 atm.: -297.4°F (-183.0°C)

pH: Not applicable.

ODOR THRESHOLD: Not applicable. Odorless.

SPECIFIC VOLUME (ft³/lb): 12.1

APPEARANCE AND COLOR: Oxygen is a colorless, odorless gas or a colorless and odorless, cryogenic liquid.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of Oxygen. A release of the Refrigerated Liquid will be obvious as a result of the fog of atmospheric moisture which condenses in the vicinity of the release. An oxygen monitor can be used to detect oxygen levels.

10. STABILITY and REACTIVITY

STABILITY: Normally stable.

DECOMPOSITION PRODUCTS: None.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Oxygen is incompatible with combustible and flammable materials, chlorinated hydrocarbons, hydrazine, reduced boron compounds, ethers, phosphine, phosphorous tribromide, phosphorous trioxide, tetrafluorethylene, and compounds which readily form peroxides. The Refrigerated Liquid will cause asphalt to ignite.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: Oxygen is the vital element in the atmosphere in which we live and breathe. The following toxicity data are for oxygen and are for exposure to high levels in extreme situations:

Cytogenetic Analysis System (hamster lung) 80 pph

TCLo (inhalation-woman) 12 pph for 10 minutes. Teratogenic effects.

TCLo (inhalation-human) 100 pph for 14 hours. Pulmonary effects.

SUSPECTED CANCER AGENT: Oxygen is not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC; therefore it is not considered to be, nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Contact with rapidly expanding gases or the refrigerated liquid can cause frostbite and damage to exposed skin and eyes.

SENSITIZATION OF PRODUCT: Oxygen is not a sensitizer.

11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Oxygen on the human reproductive system.

Mutagenicity: Oxygen is not expected to cause mutagenic effects in humans. High concentrations of Oxygen at atmospheric pressure caused chromosomal aberrations and mutations in specific test animal tissues.

Embryotoxicity: Oxygen is not expected to cause embryotoxic effects in humans.

Teratogenicity: Oxygen is not expected to cause teratogenic effects in humans. Exposure of pregnant hamsters to 3-4 atmospheres of 100% oxygen for periods of 2-3 hours on days 6, 7, and 8 of pregnancy produced teratogenic effects in small, but significant number of fetuses.

Reproductive Toxicity: Oxygen is not expected to cause adverse reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be aggravated by overexposure to Oxygen.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce overexposure. Symptoms of overexposure usually are relieved quickly. Immediate sedation and anticonvulsive therapy should be provided, as needed.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for this compound.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: Oxygen occurs naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are available for Oxygen.

OXYGEN: Log K_{ow} = -0.65, oxygen does not bioconcentrate in aquatic organisms

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No adverse effect is anticipated to occur to animal or plant-life, except for frost produced in the presence of rapidly expanding gases.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on Oxygen's effects on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Return cylinders with any residual product to Airgas Inc. Do not dispose of locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

For Oxygen, Gas:

<u>PROPER SHIPPING NAME:</u>	Oxygen, compressed
<u>HAZARD CLASS NUMBER and DESCRIPTION:</u>	2.2 (Non-Flammable Gas)
<u>UN IDENTIFICATION NUMBER:</u>	UN 1072
<u>PACKING GROUP:</u>	Not Applicable
<u>DOT LABEL(S) REQUIRED:</u>	Non-Flammable Gas, Oxidizer
<u>NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996):</u>	122

For Oxygen, Liquid:

<u>PROPER SHIPPING NAME:</u>	Oxygen, refrigerated liquid
<u>HAZARD CLASS NUMBER and DESCRIPTION:</u>	2.2 (Non-Flammable Gas)
<u>UN IDENTIFICATION NUMBER:</u>	UN 1073
<u>PACKING GROUP:</u>	Not Applicable
<u>DOT LABEL(S) REQUIRED:</u>	Non-Flammable Gas, Oxidizer
<u>NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996):</u>	122

14. TRANSPORTATION INFORMATION (Continued)

MARINE POLLUTANT: Oxygen is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Oxygen is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

CANADIAN DSL/NDL INVENTORY STATUS: Oxygen is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Oxygen is on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Oxygen is covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: No.

California - Permissible Exposure Limits for Chemical Contaminants: No.

Florida - Substance List: Oxygen.

Illinois - Toxic Substance List: No.

Kansas - Section 302/313 List: No.

Massachusetts - Substance List: Oxygen.

Minnesota - List of Hazardous Substances: No.

Michigan - Critical Materials Register: No.
Missouri - Employer Information/Toxic Substance List: No.

New Jersey - Right to Know Hazardous Substance List: Oxygen.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.

Pennsylvania - Hazardous Substance List: Oxygen.

Rhode Island - Hazardous Substance List: Oxygen.

Texas - Hazardous Substance List: No.

West Virginia - Hazardous Substance List: No.

Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Oxygen is not on the California Proposition 65 lists.

LABELING (for Liquid):

ALWAYS KEEP CONTAINER IN UPRIGHT POSITION.

WARNING:

EXTREMELY COLD, OXIDIZING LIQUID AND GAS UNDER PRESSURE.

VIGOROUSLY ACCELERATES COMBUSTION.

COMBUSTIBLES IN CONTACT WITH LIQUID OXYGEN MAY EXPLODE ON IGNITION OR CONTACT.

CAN CAUSE SEVERE FROSTBITE.

Keep oil, grease, and combustibles away.

Use only with equipment cleaned for oxygen service.

Do not get liquid in eyes, on skin, or clothing.

For liquid withdrawal, wear face shield and gloves.

Do not drop. Use hand truck for container movement.

Avoid spills. Do not walk on or roll equipment over spills.

Close valve after each use and when empty.

Use in accordance with the Material Safety Data Sheet.

FIRST-AID:

IN CASE OF FROSTBITE, obtain immediate medical attention.

DO NOT REMOVE THIS PRODUCT LABEL.

15. REGULATORY INFORMATION (Continued)

LABELING (for Compressed Gas):

WARNING:

HIGH PRESSURE OXIDIZING GAS.
VIGOROUSLY ACCELERATES COMBUSTION.

Keep oil and grease away.

Open valve slowly.

Use only with equipment cleaned for oxygen service and rated for cylinder pressure.

Close valve after each use and when empty.

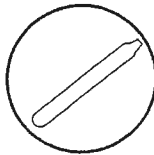
Use in accordance with the Material Safety Data Sheet.

DO NOT REMOVE THIS PRODUCT LABEL.

CANADIAN WHMIS SYMBOLS:

Class A: Compressed Gases

Class C: Oxidizer



16. OTHER INFORMATION

PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
619/565-0302

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. AIRGAS, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, AIRGAS, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (TWA), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (C). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA.

The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

The **DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA).

NIOSH issues exposure guidelines called Recommended Exposure Levels (RELs). When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard:

0 (minimal acute or chronic exposure hazard); 1 (slight acute or chronic exposure hazard); 2 (moderate acute or significant chronic exposure hazard); 3 (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); 4 (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: 0 (minimal hazard); 1 (materials that require substantial pre-heating before burning); 2 (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); 3 (Class IB and IC flammable liquids with flash points below 38°C [100°F]); 4 (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: 0 (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); 2 (materials that are unstable but do not detonate or which can react violently with water); 3 (materials that can detonate when initiated or which can react explosively with water); 4 (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard:

0 (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); 1 (materials that on exposure under fire conditions could cause irritation or minor residual injury); 2 (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); 3 (materials that can on short exposure could cause serious temporary or residual injury); 4 (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; ppm concentration expressed in parts of material per million parts of air or water; mg/m³ concentration expressed in weight of substance per volume of air; mg/kg quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. **IARC** and **NTP** rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TD₀₁**, **LDLo**, and **LD₀₁**, or **TC**, **TC₀₁**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological information: **EC** is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA** or Superfund); and various state regulations.

DATE ISSUED: 09/11/95
 SUPERSEDES DATE: 05/18/95

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME PREMIUM UNLEADED CG	PRODUCT CODE 000002 - 11131
-------------------------------------	--------------------------------

THIS PRODUCT DOES NOT MEET THE REQUIREMENTS FOR REFORMULATED GASOLINE AND MAY NOT BE USED IN ANY REFORMULATED GASOLINE COVERED AREA.

This Material Safety Data Sheet is valid for all EXXON UNLEADED SUPREME and UNLEADED PREMIUM Conventional Gasolines.

PRODUCT CATEGORY
Conventional Motor Gasoline

PRODUCT APPEARANCE AND ODOR
Clear colored liquid (typically orange)
Gasoline hydrocarbon odor

MEDICAL EMERGENCY TELEPHONE NUMBER
(713) 656-3424

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
------------	-----------------------	---------------------------

Product is a variable complex mixture of components, principally hydrocarbons, blended to performance, rather than chemical specifications and typically contains the following:

Naphtha (petroleum), light catalytic cracked	64741-55-5
Naphtha (petroleum), heavy catalytic cracked	64741-54-4
Naphtha (petroleum), full-range reformed	68919-37-9
Naphtha (petroleum), full-range alkylate	64741-64-6
Naphtha (petroleum), sweetened	64741-87-3
Butane	106-97-8

Proprietary additives	Proprietary
-----------------------	-------------

It may include varying amounts of the following identifiable components:

Benzene	71-43-2	0-4.9%
Cumene	98-82-8	0-1%
Cyclohexane	110-82-7	0-1%
Ethylbenzene	100-41-4	0-3%
Naphthalene	91-20-3	0-1%
n-Hexane	110-54-3	0-3%
Toluene	108-88-3	0-20%
Xylene	1330-20-7	0-10%

It may also include varying amounts of oxygenates such as the following:

Di-isopropyl ether	108-20-3	0-18%
Ethanol	64-17-5	0-10%
Ethyl-tertiary-butyl ether	637-92-3	0-18.5%
Methyl-tertiary-butyl ether	1634-04-4	0-16%
Tertiary-aryl-methyl-ether	994-05-8	0-18.5%

This product, as manufactured by Exxon, does not contain polychlorinated biphenyls (PCB's).

All components of this product are listed on the U.S. TSCA inventory.

See Section E for Health and Hazard Information.

See Section H for additional Environmental information.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	3	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT
100 ppm (300 mg/m3) for an 8-hour workday

BASIS
Recommended by Exxon. OSHA Regulation 29 CFR 1910.1000 and the American Conference of Governmental Industrial Hygienists (ACGIH) 1st Threshold Limit Values (TLV) of 300 ppm (900 mg/m3) for gasoline for an 8-hour workday; 500 ppm (1500 mg/m3) STEL.

50 ppm (180 mg/m3) for n-hexane for an 8-hour workday

OSHA Regulation 29 CFR 1910.1000 and recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)

50 ppm (187 mg/m3) for toluene (skin) for an 8-hour workday

Recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)

50 ppm (180 mg/m3) for methyl-tertiary-butyl ether for a 15 minute STEL

Recommended by Exxon

The airborne benzene level shall not exceed 1 ppm for an 8-hour workday; 5 ppm STEL

OSHA Regulation 29 CFR 1910.1028

**C. PRIMARY ROUTES OF ENTRY
AND EMERGENCY AND FIRST AID PROCEDURES**

EYE CONTACT

If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN

In case of skin contact, remove any contaminated clothing and wash skin with soap and water. Launder or dry-clean clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION

If overcome by vapor, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION

If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION**UNUSUAL FIRE AND EXPLOSION HAZARD****EXTREMELY FLAMMABLE VAPORS CAN TRAVEL AND EXPLODE****FLASH POINT (MINIMUM)**

FLAMMABLE - Per DOT 49 CFR 173.120
 Approximately -38°C (-36°F)

AUTOIGNITION TEMPERATURE

Approximately 456°C (853°F)
 National Fire Protection
 Association's Guide on
 Hazardous Materials

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health Flammability Reactivity
 1 3 0

BASIS

Recommended by the National Fire
 Protection Association

HANDLING PRECAUTIONS

This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)

Estimated values: Lower Flammable Limit 1.4% Upper Flammable Limit 7.6%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Tenth Edition (1991):

Use dry chemical, foam or carbon dioxide to extinguish the fire. Water may be ineffective, but water should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

NOTE: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING

"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)

High vapor concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

Prolonged or repeated liquid contact with the skin will dry and defat the skin, leading to possible irritation and dermatitis.

NATURE OF HAZARD AND TOXICITY INFORMATION

WARNING: Concentrated, prolonged or deliberate inhalation of this product may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals to high levels of toluene (levels greater than approximately 1500 ppm) has been reported to cause adverse fetal developmental effects.

Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

This product may contain up to a maximum of 4.9 weight percent benzene, CAS # 71-43-2, as a natural constituent of various gasoline blend components. Benzene can cause anemia and other blood diseases, including leukemia (cancer of the blood-forming system), after prolonged or repeated exposures at high concentrations (e.g., 50-500 ppm). It has also caused fetal defects in tests on laboratory animals.

Contains light hydrocarbon components. Lifetime studies by the American Petroleum Institute have shown that kidney damage and kidney cancer can occur in male rats after prolonged inhalation exposures at elevated concentrations of total gasoline. Kidneys of mice and female rats were unaffected. The U.S. EPA Risk Assessment Forum has concluded that the male rat kidney tumor results are not relevant for humans. Total gasoline exposure also produced liver tumors in female mice only. The implication of these data for humans has not been determined. Certain components, such as normal hexane, may also affect the nervous system at high concentrations (e.g., 1000-1500 ppm).

The presence of n-hexane (normal-hexane) in this product represents a distinct hazard of producing peripheral polyneuropathy, a progressive disorder of the nervous system, which with sufficient high exposure has the potential of becoming irreversible. This disorder has been observed in individuals exposed repeatedly to high vapor concentrations (1000-1500 ppm) of n-hexane over a period of several months. Exposure to this product should be controlled to keep the maximum level below 100 ppm, which will result in n-hexane exposure of 50 ppm or less. The OSHA 8-hour Time Weighted Average-Permissible Exposure Limit (TWA-PEL) is 50 ppm for n-hexane.

Simultaneous exposure to the vapors of n-hexane and methyl ethyl ketone (MEK) or to n-hexane and methyl isobutyl ketone (MIBK) increases the risk of adverse effects from n-hexane. Evidence in laboratory animals and humans indicates that in the presence of MEK or MIBK the neuropathy associated with n-hexane is produced in a shorter time or at lower exposure concentrations. This interaction has been reported when the exposure to n-hexane is below the American Conference of Governmental Industrial Hygienists (ACGIH) limit of 50 ppm and MEK is below the ACGIH limit of 200 ppm or when MIBK is below the ACGIH limit of 50 ppm.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of

body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

Inhalation of components of exhaust from burning, such as carbon monoxide, may cause death at high concentrations. Exposure to the exhaust of this fuel should be minimized.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Benzene - Individuals with liver disease may be more susceptible to toxic effects.

Hexane - Individuals with neurological disease should avoid exposure.

Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE

Approximately 21°C (70°F) IBP
to 225°C (437°F) FBP

VAPOR PRESSURE

Varies seasonally from
approximately 5 to 15 psi
Reid Vapor Pressure

SPECIFIC GRAVITY (15.6°C/15.6°C)

Approximately 0.74

VAPOR DENSITY (AIR = 1)

Approximately 5

MOLECULAR WEIGHT

Complex mixture, components vary
from approximately 45 to 185

PERCENT VOLATILE BY VOLUME

100

pH

Essentially neutral

EVAPORATION RATE @ 1 ATM. AND 25°C

(77°F) (n-BUTYL ACETATE = 1)
Approximately 10-11

POUR, CONGEALING OR MELTING POINT

Less than -38°C (-36°F)
Pour Point by ASTM D 97

**SOLUBILITY IN WATER @ 1 ATM.
AND 25°C (77°F)**

Negligible; less than 0.1%

VISCOSITY

Approximately 0.5 cSt @ 25°C

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc., as this presents a serious explosion hazard.

H. ENVIRONMENTAL INFORMATION

CLEAN WATER ACT / OIL POLLUTION ACT

This product may be classified as an oil under Section 311 of the Clean Water Act, and under the Oil Pollution Act. Discharges or spills into or leading to surface waters that cause a sheen must be reported to the National Response Center (1-800-424-8802).

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined spaces. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers,

watercourses, or extensive land areas.

Assure conformity with applicable governmental regulations. Continue to observe precautions for volatile, flammable vapors from absorbed material.

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302 (CERCLA Section 102)

The RQ for:

- Benzene is 10 lbs. This product may contain up to 4.9% benzene.
- Cumene is 5000 lbs. This product may contain up to 1% cumene.
- Cyclohexane is 1000 lbs. This product may contain up to 1% cyclohexane.
- Ethylbenzene is 1000 lbs. This product may contain up to 3% ethylbenzene.
- Methyl-tertiary-butyl ether is 1 lb. This product may contain up to 16% methyl-tertiary-butyl ether.
- Naphthalene is 100 lbs. This product may contain up to 1% naphthalene.
- n-Hexane is 5000 lbs. This product may contain up to 3% n-hexane.
- Toluene is 1000 lbs. This product may contain up to 20% toluene.
- Xylene is 100 lbs. This product may contain up to 10% xylene.

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355 (SARA Sections 301-304)

No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)

This product may contain:

- Up to 4.9% benzene.
- Up to 1% cumene.
- Up to 1% cyclohexane.
- Up to 3% ethylbenzene.
- Up to 16% methyl-tertiary-butyl ether.
- Up to 1% naphthalene.
- Up to 3% n-hexane.
- Up to 20% toluene.
- Up to 10% xylene.

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)

EPA HAZARD CLASSIFICATION CODE:	Acute Hazard XXX	Chronic Hazard XXX	Fire Hazard XXX	Pressure Hazard	Reactive Hazard	Not Applicable
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TOXIC SUBSTANCE CONTROL ACT

This product may contain the following TSCA 12b reportable chemical substance(s):

- Isopropanol (IPA) CAS # 67-63-0
- Methyl-tertiary-butyl ether (MTBE) CAS # 1634-04-4
- Tertiary-amyl-methyl-ether (TAME) CAS # 994-05-8

I. PROTECTION AND PRECAUTIONS

VENTILATION

Use only with ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, or use of flame or other ignition sources.

RESPIRATORY PROTECTION

Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT

Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS

Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. Adequate ventilation required sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Tanks that have been in leaded gasoline service may have lead-containing residue. Special precautions needed in cleaning. See American Petroleum Institute publications 2013, 2015 and 2015A. No smoking, flame or other ignition sources.

To minimize fire or explosion risk from static charge accumulation and discharge, effectively ground product transfer system in accordance with the National Fire Protection Association standard for petroleum products.

For use as a motor fuel only. Do not use as a cleaning solvent, or thinner, or for other non-motor fuel uses. Do not siphon by mouth. Minute amounts of liquid gasoline aspirated into the lungs may cause potentially fatal chemical pneumonitis.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE

Minimize breathing vapor or mist. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean and dry before re-use. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION AND OSHA RELATED LABEL INFORMATION**TRANSPORTATION INCIDENT INFORMATION**

For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents.

U.S. DOT HAZARDOUS MATERIALS SHIPPING DESCRIPTION

Gasoline, 3, UN 1203, II

OSHA REQUIRED LABEL INFORMATION

In compliance with hazard and right-to-know requirements, where applicable OSHA Hazard Warnings may be found on the label, bill of lading or invoice accompanying this shipment.

DANGER!

EXTREMELY FLAMMABLE

**LONG-TERM, REPEATED EXPOSURE MAY CAUSE
CANCER, BLOOD AND NERVOUS SYSTEM DAMAGE**

CONTAINS: BENZENE

Note: Product label may contain non-OSHA related information also.

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon

shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR LUBRICANTS TECHNICAL ASSISTANCE CALL: 1-800-443-9966

FOR FUELS TECHNICAL ASSISTANCE CALL: 713-656-4955

FOR AN MSDS OR ASSISTANCE WITH AN MSDS, DIRECT INQUIRIES TO THE ADDRESS BELOW OR CALL:

MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
ROOM 2345
P. O. BOX 2180
HOUSTON, TX 77252-2180
(713) 656-5949

IF YOU HAVE AN IMMEDIATE NEED FOR AN MSDS, DIAL 1-800-298-4007 FOR A FAXED COPY.

PURPLE-K

QUICK IDENTIFIER (In Plant Common Name)

Manufacturer's Name: ANSUL FIRE PROTECTION	Emergency Telephone No.: CHEMTREC (800) 424-9300
Address: One Stanton Street, Marinette, WI 54143-2542	Other Information (715) 735-7411 Call:
Prepared By: Safety and Health Department	Date Prepared: March 30, 1994

SECTION 1 — IDENTITY

Common Name: (used on label) (Trade Name and Synonyms)	Purple-K Dry Chemical Extinguishing Agent	CAS No.:	N/A
Chemical Name:	N/A This is a Mixture	Chemical Family:	Mixture
Formula:	N/A		

SECTION 2 — INGREDIENTS

PART A — HAZARDOUS INGREDIENTS				
Principal Hazardous Component(s) (chemical and common name(s)):	Wt. %	CAS No.	ACGIH TLV	Acute Toxicity Data
Muscovite Mica	<5	12001-28-2	3 mg/m ³	NDA
Magnesium Aluminum Silicate (Attapulgite Clay)	<5	8031-18-3	10 mg/M ³	NDA
PART B — OTHER INGREDIENTS				
Other Component(s) (chemical and common name(s)):	Wt. %	CAS No.		Acute Toxicity Data
Proprietary Mixtures of: Potassium Bicarbonate	90 - 93	298-14-8		NDA
Methyl Hydrogen Polysiloxane	<1	63148-57-2		NDA
Purple Pigment	<0.005	Mixture		NDA

SECTION 3 — PHYSICAL AND CHEMICAL CHARACTERISTICS (Fire and Explosion Data)

Boiling Point:	N/A	Specific Gravity (H ₂ O = 1):	N/A	Vapor Pressure (mm Hg):	N/A
Percent Volatile by Volume (%):	N/A	Vapor Density (Air = 1):	N/A	Evaporation Rate (= 1):	N/A
Solubility in Water:	Slight	Reactivity in Water:	N/A		
Appearance and Odor:	Violet colored powder, no characteristic odor				
Flash Point:	None	Flammable Limits in Air % by Volume:	N/A	Extinguisher Media:	N/A
Auto-ignition Temperature:	N/A				
Special Fire Fighting Procedures:	NONE - THIS IS AN EXTINGUISHING AGENT				
Unusual Fire and Explosion Hazards:	None				

SECTION 4 — PHYSICAL HAZARDS

Stability:	Unstable <input type="checkbox"/> Stable <input checked="" type="checkbox"/>	Conditions to Avoid:	N/A
Incompatibility (Materials to Avoid):	Strong acids, NaK alloy and NH ₄ H ₂ PO ₄		
Hazardous Decomposition Products:	CO ₂		
Hazardous Polymerization:	May Occur <input type="checkbox"/> Will Not Occur <input checked="" type="checkbox"/>	Conditions to Avoid:	N/A

SECTION 5 — HEALTH HAZARDS

Threshold Limit Value:	OSHA nuisance dust limit of 15 mg/M ³ or ACGIH nuisance dust value of 10 mg/M ³ for the eight hour time-weighted average.		
Routes of Entry:	Mildly irritating for a short period of time.		
Eye Contact:			
Skin Contact:	May be mildly irritating.		
Inhalation:	Treat as a mineral dust. Irritant to the respiratory tract.		
Ingestion:	Not an expected route of entry.		
Signs and Symptoms:	Acute Overexposure: Transient cough, shortness of breath. Chronic Overexposure: Chronic fibrosis of the lung.		
Medical Conditions Generally Aggravated by Exposure:	Reactive airway		
Chemical Listed as Carcinogen or Potential:	National Toxicology Program: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	I.A.R.C. Monographs: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	CSHA: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

SECTION 6 — EMERGENCY AND FIRST AID PROCEDURES

Eye Contact:	Flush with large amounts of water; if irritation persists, seek Medical attention.
Skin Contact:	Wash with soap and water; if irritation persists, seek Medical attention.
Inhalation:	Remove victim to fresh air. Seek Medical attention if discomfort continues.
Ingestion:	If patient is conscious, give large amounts of water and induce vomiting. Seek Medical help.

SECTION 7 — SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type):	Dust mask where dustiness is prevalent, or TLV exceeded. Mechanical filter respirator if exposure is prolonged.		
Ventilation:	Local Exhaust: Discretionary	Mechanical (General):	Recommended
Protective Gloves:	N/A	Eye Protection:	Recommended as mechanical barrier for prolonged exposure.
Other Protective Clothing or Equipment:	If irritation occurs, long sleeves and impervious gloves should be worn.		

SECTION 8 — SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken in Handling and Storage:	Should be stored in original container or Ansul fire extinguisher.
Other Precautions:	Do not mix agents.
Steps to be Taken in Case Material is Released or Spilled:	Sweep up.
Waste Disposal Methods:	Dispose of in compliance with local, state, and federal regulations. Components are nonhazardous, sanitary landfill disposal is acceptable.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM RATINGS

HAZARD INDEX:	
4 Severe Hazard	<u>1</u> HEALTH
3 Serious Hazard	<u>0</u> FLAMMABILITY
2 Moderate Hazard	<u>0</u> REACTIVITY
1 Slight Hazard	
0 Minimal Hazard	
N/A = Not Applicable NDA = No Data Available	

ANSUL is a registered trademark.

SHELL OIL -- SG-CE HEAVY DUTY MOTOR OIL 15W-40 - LUBRICATING OIL,ENGINE
MATERIAL SAFETY DATA SHEET
SHELL OILNSN: 9150012278211
Manufacturer's CAGE: 54527
Part No. Indicator: A
Part Number/Trade Name: SG/CE HEAVY DUTY MOTOR OIL 15W/40

=====
General Information
=====

Item Name: LUBRICATING OIL,ENGINE
Company's Name: SHELL OIL COMPANY
Company's Street: HEALTH, SAFETY AND ENVIRONMENT
Company's P. O. Box: 4320
Company's City: HOUSTON
Company's State: TX
Company's Country: US
Company's Zip Code: 77210
Company's Emerg Ph #: 713-473-9461
Company's Info Ph #: 713-241-4819
Record No. For Safety Entry: 005
Tot Safety Entries This Stk#: 006
Status: SE
Date MSDS Prepared: 15NOV89
Safety Data Review Date: 02MAY91
Supply Item Manager: CX
MSDS Preparer's Name: J. C. WILLETT
MSDS Serial Number: BJRSQ
Spec Type, Grade, Class: 15W-40 GRADE
Hazard Characteristic Code: N1
Unit Of Issue: BX
Unit Of Issue Container Qty: 12 QUARTS
Type Of Container: BOX OF 12 QT
Net Unit Weight: 21.9 LBS

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: DISTILLATES, HYDROTREATED HEAVY PARAFFINIC
Ingredient Sequence Number: 01
Percent: 70-75
NIOSH (RTECS) Number: PY8035500
CAS Number: 64742-54-7
OSHA PEL: 300 PPM
ACGIH TLV: 300 PPM
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: POLYMERIC ADDITIVE IN OIL
Ingredient Sequence Number: 02
Percent: 10-15
NIOSH (RTECS) Number: 1003500PA
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: ADDITIVE PACKAGE CONTAINING ZINC DIALKYL DITHIOPHOSPHATE
Ingredient Sequence Number: 03
Percent: 10-15

NIOSH (RTECS) Number: 1002891AC
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE SPECIFIED

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: DARK AMBER OIL; SLIGHT HYDROCARBON ODOR
Melting Point: -20F, -29C
Specific Gravity: 0.8789
Decomposition Temperature: UNKNOWN
Solubility In Water: NEGLIGIBLE
Viscosity: 100 CS @40C
Corrosion Rate (IPY): UNKNOWN

=====
Fire and Explosion Hazard Data
=====

Flash Point: 370F, 204C
Flash Point Method: PMCC
Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
DO NOT USE DIRECT STREAM OF WATER.
Special Fire Fighting Proc: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A
FULL FACED SELF CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS
WITH WATER SPRAY. CONTAIN RUNOFF.
Unusual Fire And Expl Hazrds: COMBUSTION OR HEAT OF FIRE MAY PRODUCE
HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): EXTREMELY HIGH TEMPERATURES AND OPEN FLAMES.
Materials To Avoid: STRONG OXIDIZING AGENTS
Hazardous Decomp Products: CARBON DIOXIDE, CARBON MONOXIDE, ALDEHYDES AND
KETONES, AND OTHER COMBUSTION PRODUCTS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50 (ORAL RAT) IS ESTIMATED AT >5 G/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EYES/SKIN: IRRITATION. AVOID BREATHING OF
MIST. PROLONGED OVEREXPOSURE MAY RESULT IN DERMATITIS AND RESPIRATORY
DIFFICULTIES. ANIMAL STUDIES ALSO SHOW AN EFFECT ON THE KIDNEYS FOR
EXPOSURE TO MATERIALS SIMILAR TO THIS. ABOVE TEMPERATURES OF 100F,
ASPIRATION INTO THE LUNGS IS A HAZARD.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE OF THE CHEMICALS IN THIS PRODUCT IS
LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN. MAY BE WEAKLY MUTAGENIC.
Signs/Symptoms Of Overexp: IRRITATION OF EYES AND SKIN UPON CONTACT.
IRRITATION OF THE RESPIRATORY TRACT, HEADACHES, DIZZINESS, ANESTHETIC
EFFECT AND OTHER CENTRAL NERVOUS SYSTEM EFFECTS INCLUDING DEATH IN RARE
CASES.
Med Cond Aggravated By Exp: PERSONS WITH A HISTORY OF EYE, SKIN AND
RESPIRATORY DISORDERS MAY BE AT INCREASED RISK FROM EXPOSURE.
Emergency/First Aid Proc: EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR

15 MINUTES. GET MEDICAL ATTENTION. SKIN: WASH WITH SOAP AND WATER.
INHALATION: REMOVE TO FRESH AIR. IF BREATHING IS IRREGULAR OR HAS STOPPED,
START RESUSCITATION AND ADMINISTER OXYGEN. GET MEDICAL HELP IMMEDIATELY.
INGESTION: DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION AT ONCE. IN CASE
OF SUBCUTANEOUS OR INTRAMUSCULAR INJECTION, SEEK HELP AT ONCE.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: WEAR PROTECTIVE EQUIPMENT, ELIMINATE SOURCES
OF IGNITION, AND VENTILATE AREA AS REQUIRED. RECOVER FREE LIQUID. ABSORB
SMALL SPILL WITH INERT MATERIAL. PLACE WASTE IN DOT APPROVED CONTAINER FOR
DISPOSAL. KEEP MATERIAL FROM WATERWAYS.

Neutralizing Agent: NONE

Waste Disposal Method: DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE
FEDERAL, STATE AND LOCAL REGULATIONS. CONTAMINATED OIL MAY BE REGULATED AS
A HAZARDOUS WASTE.

Precautions-Handling/Storing: STORE IN A COOL, DRY, WELL VENTILATED AREA
AWAY FROM SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE.
PROTECT FROM PHYSICAL DAMAGE.

Other Precautions: AVOID BREATHING OF MIST. MINIMIZE PERIODS OF EXPOSURE
TO HIGH TEMPERATURE. AVOID WATER CONTAMINATION.

=====
Control Measures
=====

Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION
EXPOSURES BELOW PEL (TLV), USE NIOSH/MSHA APPROVED RESPIRATOR AS PER
CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR
SELECTION.

Ventilation: MECHANICAL (GENERAL) VENTILATION IS USUALLY ADEQUATE.

Protective Gloves: NITRILE RUBBER GLOVES

Eye Protection: SAFETY GLASSES/CHEMICAL SPLASH GOGGLES

Other Protective Equipment: SAFETY SHOWER AND EYE BATH. INDUSTRIAL TYPE
WORK CLOTHING AND APRON AS REQUIRED TO AVOID PROLONGED OR REPEATED CONTACT.

Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING
OR DRINKING. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.

Suppl. Safety & Health Data: USE AIR-SUPPLIED RESPIRATORY EQUIPMENT IF
EXPOSED TO HOT FUMES. TREAT EMPTY CONTAINERS AS DANGEROUS; DO NOT
PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE CONTAINERS TO
HEAT, FLAME, SPARKS, PILOT LIGHTS, STATIC ELECTRICITY. RESIDUE MAY BE
DIFFICULT TO REMOVE.

=====
Transportation Data
=====

Trans Data Review Date: 91089

DOT PSN Code: ZZZ

DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

IMC PSN Code: ZZZ

IMC Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

IATA PSN Code: ZZZ

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

AFR PSN Code: ZZZ

AFR Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Additional Trans Data: BOX OF 12 1-QUART CANS
=====

Disposal Data
=====

=====
Label Data
=====

Label Required: YES

Technical Review Date: 30MAR91

Label Status: F

Common Name: SG/CE HEAVY DUTY MOTOR OIL 15W/40

Chronic Hazard: NO

Signal Word: CAUTION!

Acute Health Hazard-Slight: X

Contact Hazard-Slight: X

Fire Hazard-Slight: X

Reactivity Hazard-None: X

Special Hazard Precautions: EYES/SKIN: IRRITATION. AVOID BREATHING OF MIST. PROLONGED OVEREXPOSURE MAY RESULT IN DERMATITIS AND RESPIRATORY DIFFICULTIES. ANIMAL STUDIES ALSO SHOW AN EFFECT ON THE KIDNEYS FOR EXPOSURE TO MATERIALS SIMILAR TO THIS. ABOVE TEMPERATURES OF 100F, ASPIRATION INTO THE LUNGS IS A HAZARD. STORE IN A COOL, DRY, WELL VENTILATED AREA AWAY FROM SOURCES OF IGNITION. KEEP CONTAINER CLOSED WHEN NOT IN USE. PROTECT FROM PHYSICAL DAMAGE. FIRST AID: EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR 15 MINUTES. GET MEDICAL ATTENTION. SKIN: WASH WITH SOAP AND WATER. INHALATION: REMOVE TO FRESH AIR. IF BREATHING IS IRREGULAR OR HAS STOPPED, START RESUSCITATION

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: SHELL OIL COMPANY

Label Street: HEALTH, SAFETY AND ENVIRONMENT

Label P.O. Box: 4320

Label City: HOUSTON

Label State: TX

Label Zip Code: 77210

Label Country: US

Label Emergency Number: 713-473-9461

Year Procured: 1991

=====
MSDS Safety Information
=====

FSC: 9150

NIIN: 00-458-0075

MSDS Date: 10/01/1993

MSDS Num: BZNVH

Product ID: WD-40 AEROSOL

MFN: 01

Responsible Party

Cage: 09137

Name: WD-40 COMPANY

Address: 1061 CUDAHY PLACE (92110)

Box: 80607

City: SAN DIEGO CA 92138-9021

Info Phone Number: 619-275-1400

Emergency Phone Number: 619-275-1400, CHEMTREC 800-424-9300

Preparer's Name: R.MILES

Review Ind: Y

Published: Y
=====Contractor Summary
=====

Cage: 09137

Name: WD-40 COMPANY

Address: 1061 CUDAHY PLACE (92110)

Box: 80607

City: SAN DIEGO CA 92138-9021

Phone: 619-275-1400, CHEMTREC 800-424-9300
=====Item Description Information
=====

Item Manager: S9G

Item Name: LUBRICATING OIL, GENERAL PURPOSE

Specification Number: VV-L-800C

Type/Grade/Class: NONE

Unit of Issue: CN

Quantitative Expression: 00000000016OZ

UI Container Qty: 16 OZ

Type of Container: CAN, AEROSOL
=====Ingredients
=====

Cas: 8052-41-3

RTECS #: WJ8925000

Name: STODDARD SOLVENT

% Wt: 50

Other REC Limits: NONE RECOMMENDED

OSHA PEL: 500 PPM

ACGIH TLV: 100 PPM; 9596

Cas: 68476-85-7

RTECS #: SE7545000

Name: LPG (LIQUEFIED PETROLEUM GAS)

% Wt: 25

Other REC Limits: NONE RECOMMENDED

OSHA PEL: 1000 PPM

ACGIH TLV: 1000 PPM; 9596

Cas: 64742-65-0
RTECS #: PY8038500
Name: MINERAL OIL, PETROLEUM DISTILLATE, SOLVENT DEWAXED (MILD), HEAVY
PARAFFINIC
% Wt: >15
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

RTECS #: 1000314NH
Name: NON-HAZARDOUS INGREDIENTS
% Wt: <10
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
=====

Health Hazards Data
=====

LD50 LC50 Mixture: TLV IS 100PPM(ALIPHATIC PET DISTILLATES)
Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: YES
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: EYES:MAY CAUSE IRRITATION.SKIN:MAY CAUSE IRRITATION AND
DRYNESS.INGEST:MAY CAUSE GI TRACT IRRITATION.MAY CAUSE LUNG DAMAGE IF VOMITED
AFTER INGESTING.INHAL:MAY CAUSE RESPIRATORY IRRITATION AND CNS EFFECTS.
Explanation Of Carcinogenicity: THERE ARE NO INGREDIENTS ABOVE 0.1% WHICH ARE
IDENTIFIED AS CARCINOGENS BY NTP,IARC OR OSHA.
Signs And Symptions Of Overexposure:
INHAL:ANESTHESIA,HEADACHE,DIZZINESS,NAUSEA.EYES:TEARING,REDNESS.INGEST:NAUSEA
,VOMITING,DIARRHEA.
Medical Cond Aggravated By Exposure: NONE SPECIFIED BY MANUFACTURER.
First Aid: SKIN:REMOVE CONTAMINATED CLOTHING;WASH WITH SOAP AND
WATER.EYES:FLUSH WITH WATER FOR 15 MINUTES.INHAL:REMOVE TO FRESH AIR.GIVE
OXYGEN OR ARTIFICIAL RESPIRATION IF NEEDED.INGEST:DO NOT INDUCE VOMITING.GET
PROMPT QUALIFIED MEDICAL ATTENTION.
=====

Handling and Disposal
=====

Spill Release Procedures: SPILL IS UNLIKELY FROM AEROSOL CANS.LEAKING CANS
SHOULD BE PLACED IN A PLASTIC BAG OR PAIL UNTIL PRESSURE HAS DISSIPATED.
Waste Disposal Methods: DISPOSE OF IN ACCORDANCE WITH FEDERAL,STATE AND LOCAL
REGULATIONS.EMPTY AEROSOL CANS SHOULD NOT BE PUNCTURED OR INCINERATED;LIQUID
SHOULD BE INCINERATED OR BURIED IN LAND FILL.RCRA CODE D001(IGNITABLE).
Handling And Storage Precautions: STORE AT TEMPERATURES BELOW 120F.FOLLOW LABEL
DIRECTIONS.
Other Precautions: FOLLOW LABEL DIRECTIONS.AVOID BREATHING VAPORS.AVOIDSKIN AND
EYE CONTACT.
=====

Fire and Explosion Hazard Information
=====

Flash Point Text: EXTREMELY FLAMBL
Lower Limits: 1.8
Upper Limits: 9.5
Extinguishing Media: DRY CHEMICAL,CARBON DIOXIDE,FOAM.
Fire Fighting Procedures: USE A SELF-CONTAINED BREATHING APPARATUS AND FULL
PROTECTIVE EQUIPMENT.COOL FIRE EXPOSED CONTAINERS WITH WATER FOG.

Product ID: WD-40 AEROSOL
Cage: 09137
Company Name: WD-40 COMPANY
Street: 1061 CUDAHY PLACE (92110)
PO Box: 80607
City: SAN DIEGO CA
Zipcode: 92138-9021
Health Emergency Phone: 619-275-1400, CHEMTREC 800-424-9300
Label Required IND: Y
Date Of Label Review: 06/17/1996
Status Code: C
MFG Label NO: UNKNOWN
Label Date: 06/17/1996
Origination Code: F
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: DANGER
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: Severe
Reactivity Hazard: None

Hazard And Precautions: EYES:MAY CAUSE IRRITATION.SKIN:MAY CAUSE IRRITATION AND DRYNESS.INGEST:MAY CAUSE GI TRACT IRRITATION.MAY CAUSE LUNG DAMAGE IF VOMITED AFTER INGESTING.INHAL:MAY CAUSE RESPIRATORY IRRITATION AND CNS EFFECTS. STORE AT TEMPERATURES BELOW 120F.F OLLOW LABEL DIRECTIONS. FIRST AID: SKIN:REMOVE CONTAMINATED CLOTHING;WASH WITH SOAP AND WATER.EYES:FLUSH WITH WATER FOR 15 MINUTES.INHAL:REMOVE TO FRESH AIR.GIVE OXYGEN OR ARTIFICIAL RESPIRATION IF NEEDED.INGEST:DO NOT INDUCE VOMITING.GET PROMPT QUALIFIED MEDICAL ATTENTION.

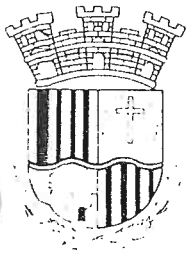
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**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS**

NAVSTA ROOSEVELT ROADS, PUERTO RICO

J-22 Non-Hazardous Waste Manifest



ESTADO LIBRE ASOCIADO DE PUERTO RICO
GOBIERNO MUNICIPAL DE JUNCOS
APARTADO 1706
JUNCOS, PUERTO RICO 00666

DESPERDICIOS SOLIDOS

FACTURA NO. _____

Fec ha: 6/5/2002

Compañía: A.S. Warts

Hor a: 9:20 AM PM Tablilla: HP 1119 Lic.# 227 3295

Compactor: MAK

Recipiente: _____

Yardas: 20

Yardas: 20

Tumba: _____

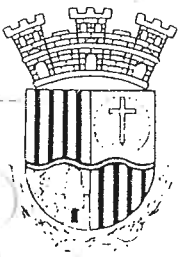
Arrastre: _____

Ton. _____

Ton. _____

AED
Firma Encargado de Vertedero

[Signature]
Firma Chofer o Cliente



ESTADO LIBRE ASOCIADO DE PUERTO RICO
GOBIERNO MUNICIPAL DE JUNCOS
APARTADO 1706
JUNCOS, PUERTO RICO 00666

DESPERDICIOS SOLIDOS

FACTURA NO. 26039

Fecha: 4-29-002

Compañía: A-A Waste

Hora: 156 AM PM Tablilla: 10197 1-11-1999 2723295

Compactor: maxte Recipiente: _____

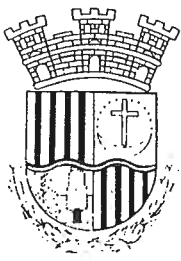
Yardas: 20 Yardas: 20

Tumba: _____ Arrastre: _____

Ton. _____ Ton. _____

[Signature]

Samuel Roman



ESTADO LIBRE ASOCIADO DE PUERTO RICO
GOBIERNO MUNICIPAL DE JUNCOS
APARTADO 1706
JUNCOS, PUERTO RICO 00666

DESPERDICIOS SOLIDOS

FACTURA NO. 26042

Fecha: 2/5/2001

Compañía: A.A. Waste

Hora: 11:30 AM PM Tablilla: HP3623 Lic.# 2275371

Compactor: MACK Recipiente: _____

Yardas: 20 Yardas: 20

Tumba: _____ Arrastre: _____

Ton. _____ Ton. _____

AED
Firma Encargado de Vertedero

[Signature]
Firma Chofer o Cliente



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS**

NAVSTA ROOSEVELT ROADS, PUERTO RICO

J-23 Oxygen Meter Certification of Calibration

Instrumentation Division
 6825 West Sam Houston Parkway N.
 Houston, TX 77041
 (800) 826-6328

LTX 312
 Model _____
 Customer WALLEY INTERNATIONAL
 Work Order _____
ISC
 Manufacturer _____
 Serial Number 8011030-278

Charger Type

Passed N/A

Single Unit Charger

Five Unit Charger

12 Unit Charger

4 Unit Smart Charger

Other _____

Pump Type

Flow Test Passed N/A

SP 200 _____ inches H₂O vacuum

SP 202

SP 400

SP 402

Sample Draw (Internal Pump Instrument)

Other _____

Gillian Pump Inspection Report				and Flow Panel S/N			
Test Performed with Gilibrator S/N							
	PUMP TYPE	TEST #1 REQUIREMENTS	TEST #1 (as left)	TEST #2 REQUIREMENTS	TEST #2 (as left)	FINAL FLOW	N/A
1	GIL-AIR SERIES	750 cc @ 20" H ₂ O		2.5 LPM @ 15" H ₂ O			↑
2	GIL-AIR 5 OLD STYLE	1 LPM @ 37" H ₂ O		3 LPM @ 32" H ₂ O			↑ ↓
3	GIL-AIR 5 NEW STYLE (8" Present)	1 LPM @ 32" H ₂ O		3 LPM @ 28" H ₂ O			
4	HFS 113	1 LPM @ 20" H ₂ O		3 LPM @ 15" H ₂ O			
5	HFS 513	1.5 LPM @ 25" H ₂ O		4 LPM @ 20" H ₂ O			
6	LFS 113	50 cc @ 25" H ₂ O		200 cc @ 21" H ₂ O			
7							

Final Sensor Response (as left condition)									
SENSOR	GAS	GAS VALUE	ALARM POINT(S)	FINAL READING	MIN SPAN	MAX SPAN	SENSOR SERIAL NUMBER	CYLINDER ID NUMBER	N/A
COMB	METHANE								✓
COMB	PENTANE	25 % LEL	10	25	1/2	1/2	0010071315	902511	
COMB									✓
OXYGEN	AIR	21.0 % VOL	N/A	21.0	1/2	1/2	0195950120	- - -	
TOXIC	H ₂ S	PPM							✓
TOXIC	CO	PPM							✓
TOXIC	Cl ₂	PPM							✓
TOXIC	HCN	PPM							✓
									✓
									✓

Final Inspection and Calibration Performed By H.W. Technician Number _____ Date Inspection Performed 4-9-02



Instrumentation Division
6825 West Sam Houston Parkway N.
Houston, TX 77041
(8-00) 826-6328

LTX312

Model

WORLEY INTERNATIONAL

Customer

Work Order

ISC

0005030-393

Manufacturer

Serial Number

Charger Type

Passed N/A

Single Unit Charger

Five Unit Charger

12 Unit Charger

4 Unit Smart Charger

Other _____

Pump Type

Flow Test Passed _____ inches H₂O vacuum N/A

SP 200

SP 202

SP 400

SP 402

Sample Draw (Internal Pump Instrument)

Other _____

Giljan Pump Inspection Report

Test Performed with Gilibrator S/N _____

and Flow Panel S/N _____

	PUMP TYPE	TEST #1 REQUIREMENTS	TEST #1 (as left)	TEST #2 REQUIREMENTS	TEST #2 (as left)	FINAL FLOW	N/A
1	GIL-AIR SERIES	750 cc @ 20" H ₂ O		2.5 LPM @ 15" H ₂ O			↑ ↓
2	GIL-AIR 5 OLD STYLE	1 LPM @ 37" H ₂ O		3 LPM @ 32" H ₂ O			
3	GIL-AIR 5 NEW STYLE (8" Present)	1 LPM @ 32" H ₂ O		3 LPM @ 28" H ₂ O			
4	HFS 113	1 LPM @ 20" H ₂ O		3 LPM @ 15" H ₂ O			
5	HFS 513	1.5 LPM @ 25" H ₂ O		4 LPM @ 20" H ₂ O			
6	LFS 113	50 cc @ 25" H ₂ O		200 cc @ 21" H ₂ O			
7							

Final Sensor Response (as left condition)

SENSOR	GAS	GAS VALUE	ALARM POINT(S)	FINAL READING	MIN SPAN	MAX SPAN	SENSOR SERIAL NUMBER	CYLINDER ID NUMBER	N/A
COMB	METHANE								✓
COMB	PENTANE	25% LEL	10	25	N/A	N/A	0004111-132	20115693	
COMB									✓
OXYGEN	AIR	21.0% VOL	19.5	21.0	N/A	N/A	0932491101	- 0 -	
TOXIC	H ₂ S	PPM							✓
TOXIC	CO	PPM							✓
TOXIC	Cl ₂	PPM							✓
TOXIC	HCN	PPM							✓
									✓
									✓

H.W.

Final Inspection and Calibration Performed By

Technician Number

4-3-02

Date Inspection Performed

David A Reed



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

J-24 Inspection – Inspector Personnel Qualifications

D. E. (Sonny) Weathers

2931 West State Hwy. 97
Gonzales, Texas 78629
830.437.5413 Home
830.857.0284 Cell

OBJECTIVE

Employment as a pipeline inspector.

QUALIFICATIONS

Accomplished pipeline welder/inspector and fabricator who grew up at a natural gas facility in South Texas. Strengths are: honest, responsible, impartial, and consistent with high work standards. Strong communication skills in English and Spanish. A dedication to the pipeline industry and to professionalism in inspection.

SPECIAL TRAINING

National Welding Inspection School
Certified Welding Inspector - 1998

Land Services, Inc.
Environmental Training - 2001

United Association-Local 798
National Pipeline Welding Inspection School - 2002
D.O.T. 49 CFR parts 192 and 195

Mustang Engineering, Inc.
Pipeline Environmental Training - 2001

Bridgeline Gas
OSHA Training, Competent Person - 1999

El Paso Inspectors Seminar
Welding, NDT, and Pipe Coating - 2000

EDUCATION

Eagle Pass High School-Eagle Pass, TX
Sul Ross University-Alpine, TX
Texas A&M University-Kingsville, TX

MEMBERSHIP

American Welding Society

EMPLOYMENT

1972-1998 X-Ray quality welding for the following companies:

Amoco Pipeline, Bridgeline Gas, Chevron, Coastal States, Colorado Interstate, Conoco, Diamond Shamrock, Southern Union, Enron, Exxon, GPM (Philips) Gas, Koch Pipeline, Kansas-Nebraska Interstate, Marathon, MAPCO, Mobil Pipeline, Natural Gas Pipeline, Shell Pipeline, Southern Natural Gas, Sun Pipeline, Texas-New Mexico Pipeline, Tosco Energy, Transwestern Pipeline, Valero Transmission Company, and Warren Gulf Gas Company.

1997- Present Inspection work experience

Diamond Shamrock Hope, NM

Duties: Weld inspection of piping in new pump station on 12" products line from Panhandle to El Paso, TX. Inspect tie-ins, weld repairs, sandblasting and painting.

1997 Wilcrest Field Services for Bridgeline Gas, Sorrento, LA

Duties: Weld inspection and weld mapping of fabrication on metering station. Inspection on 6" and 8" dual pipelines with railroad and road bores. Inspection of field joint taping of the underground piping and inspection of backfill.

1-573-474-8777 p. 3
1998 Wilcrest Field Services for Bridgeline Gas, Gramercy, LA

Duties: Weld inspection on firing line for 8 weeks and moved to pipe gang after the loss of a senior welding inspector. Other duties included: testing welders, inspection of tie-in fabrication, jeeing, directional drilling (including the Mississippi River), hydrostatic testing, field-joint applications and backfill. In charge of welding inspection on the last 10 mile push in the marshlands. Handled weld mapping of fabrication on master print and assisted with as-builts.

1998 Wilcrest Field Services for Bridgeline Gas, Prarieview, LA

Duties: In charge of testing welders, coordinating x-ray, receiving and verifying materials, inspection of fabrication piping, hydrostatic testing, and weld mapping x-ray welds on master print. Inspection of fabrication tie-ins, field taping and backfill.

1999 CDI Technical Services for Enron, Arvada, CO

Duties: Weld inspection for pipe gang and firing line on 35 miles of 10" gas pipeline on Lost Creek Project from Jeffery City to Riverton, Wyoming. Also checked bending.

2000 Durham Inspection Services for Koch Pipeline, Houston, TX

Duties: Utilities inspection over Laney boring crew on Koch 12" propane pipeline. Oversee bore pits, shields, safety, carrier pipe, filed joint application quality, holiday detection and repair, weld inspection on carrier pipe and inspected tie-ins.

2000 Cleveland Inspection Service for Conoco Pipeline, Rocksprings, WY

Duties: Utilities inspection over Sunland Construction boring crew on 280 miles of Conoco 12" products pipeline. Oversee inspecting of bore pits, safety, welding of carrier pipe and repair, field joint application, rock shield application, holiday detection and repair.

2000-2001 Cleveland Inspection Service for Velocita Communications, US

Duties: Inspection and supervision of contract work, building re-generation sites for fiber optics. Inspection consisted of site layout, site preparation, forming, pouring and finishing concrete, base material, compaction, fencing, and agragate work. Also trenching and laying fiber and electrical conduit lines.

2002 Cleveland Inspection Service for Velocita Communications, US

Duties: As-building eighteen sites from Liberty, TX to DeLand, FL, consisting of complete site layout, slab, buildings, fencing, and all underground lines and utilities. Lines were found with line locator.

REFERENCES

Clyde Johnson

Welding Inspector
P.O. Box 8688
Longview, TX 75607
903.643.3139 Home
903.235.4592 Cell

Don Campbell

Welding Inspector
P.O. Box 97
Warsaw, MO 65355
505.396.3993 Home

Danny Williams

Superintendant, Bridgeline Gas
Clinton, LA
225.683.4598 Home
504.712.5708 Office

Jerry Dodd

Welding Inspector
26 West Avenue O
Svington, NM 88260
505.396.3993 Home

Doyle Barnett

Inspector, Past President
1018 Peterson
Wichita, KS 67212
316.722.7220 Home

Jim Bell

Welding Inspector
Southern Natural Gas
Magee, MS
Home-601.849.2551



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
PROJECT CERTIFICATION REPORT - PIPELINE REPAIRS AND MODIFICATIONS
NAVSTA ROOSEVELT ROADS, PUERTO RICO**

J-25 Inspection – GPS Pipeline Readings

Locate and GPS Line 12" DFM-Secondary 512 – Start at 466 Building

DFMS 12"	Where pipe goes in ground at Bldg. 466	N18° 13' 55.4" W065° 37' 14.6"
	Start of long sweeping PI	N18° 13' 58.5" W065° 37' 18.6"
	Long sweeping PI	N18° 13' 59.7" W065° 37' 19.8"
	Edge of road, long sweeping PI	N18° 14' 00.9" W065° 37' 21.0"
	Edge of road, long sweeping PI	N18° 14' 02.3" W065° 37' 21.8"
	End of PI	N18° 14' 03.6" W065° 37' 21.7"
	Valve where goes back into ground and makes PI	N18° 14' 05.7" W065° 37' 21.4"
	Across road PI or T into other line	N18° 14' 05.6" W065° 37' 20.6"

12" GPS DFM-Secondary from PH 466 to Pier 1

	From Bldg. 456 where pipeline goes into ground; start of line by 192 PI	N18° 13' 54.9" W065° 37' 13.8"
	Pier side of building	N18° 13' 54.1" W065° 37' 13.6"
	Start of PI	N18° 13' 53.0" W065° 37' 13.4"
	End of PI	N18° 13' 52.9" W065° 37' 13.5"
	At Army Reserve fence	N18° 13' 51.3" W065° 37' 14.7"
	PI at fence; start of PI	N18° 13' 50.5" W065° 37' 15.0"
	End of PI at pier	N18° 13' 50.2" W065° 37' 14.9"
	PI short radius 90 PI on pier	N18° 13' 48.5" W065° 37' 16.2"
	At Pit #1 where goes into valve pit	N18° 13' 48.2" W065° 37' 16.1"

GPS 12" DFM-P from Ph 1982 to above ground valve settings

12"	First could not do valves; they are under concrete. Building about 15' away from building. Start to PI pipelines are together.	N18° 13' 56.3" W065° 37' 14.0"
	At PI around electrical	N18° 13' 56.6" W065° 37' 14.5"
	At PI around electrical	N18° 13' 57.0" W065° 37' 15.0"
	PI at test leads	N18° 13' 57.2" W065° 37' 15.4"
	At fence	N18° 13' 58.6" W065° 37' 17.5"
	Start of long sweeping PI	N18° 14' 00.9" W065° 37' 20.5"
	Still on long PI	N18° 14' 01.6" W065° 37' 21.1"
	Still on long sweeping PI	N18° 14' 02.3" W065° 37' 21.4"
	Still on long sweeping PI	N18° 14' 02.9" W065° 37' 21.5"
	At test leads, end of PI	N18° 14' 04.1" W065° 37' 21.3"
	Start of PI	N18° 14' 05.9" W065° 37' 20.7"
	End of PI	N18° 14' 06.0" W065° 37' 20.6"
	PI at valve going toward fence	N18° 14' 06.3" W065° 37' 20.5"
	At fence at tank	N18° 14' 06.1" W065° 37' 19.6"

GPS 16" JP-5 from PH 1982 to Tank Farm JP-5

16"	Could not GPS valves because under concrete building; moved away about 15'.	N18° 13' 56.3" W065° 37' 14.0"
	At PI around electrical	N18° 13' 56.6" W065° 37' 14.5"
	At PI around electrical	N18° 13' 57.0" W065° 37' 15.0"
	PI at test leads	N18° 13' 57.2" W065° 37' 15.4"
	At fence	N18° 13' 58.6" W065° 37' 17.5"
	Start of PI	N18° 14' 00.9" W065° 37' 20.5"
	Still long sweeping PI	N18° 14' 01.6" W065° 37' 21.1"
	Still in long sweeping PI	N18° 14' 02.3" W065° 37' 21.4"
	Still in long sweeping PI	N18° 14' 02.9" W065° 37' 21.5"
	At test leads, end of PI	N18° 14' 04.1" W065° 37' 21.3"
	Short radius PI to across road	N18° 14' 06.6" W065° 37' 20.7"
	Across road into brush; thick trees	N18° 14' 06.7" W065° 37' 21.1"
	PI in heavy brush	N18° 14' 06.9" W065° 37' 22.1"
	Edge of trees before BBD	N18° 14' 08.2" W065° 37' 22.8"
	Edge of fence BBD	N18° 14' 08.8" W065° 37' 23.2"
	Edge of BBD fence towards Tank Farm	N18° 14' 10.7" W065° 37' 24.4"
	Edge of trees towards Tank Farm	N18° 14' 11.7" W065° 37' 25.0"
	At fence of Tank Farm	N18° 14' 13.4" W065° 37' 26.3"
	PI in Tank Farm	N18° 14' 13.8" W065° 37' 26.5"
	Last reading in Tank Farm	N18° 14' 13.8" W065° 37' 27.6"

8" JP-5 from Tank farm to Air Field

	At Pit #7	N18° 14' 21.6" W065° 37' 25.6"
	Starts long PI sweeping	N18° 14' 23.1" W065° 37' 25.3"
	Long sweeping PI	N18° 14' 24.2" W065° 37' 25.3"
	Start of PI	N18° 14' 26.0" W065° 37' 25.7"
	End of PI	N18° 14' 26.1" W065° 37' 25.7"
	PI to valve Pit #9	N18° 14' 28.9" W065° 37' 34.9"
	PI post valve Pit #9	N18° 14' 29.6" W065° 37' 35.7"
	PI along road	N18° 14' 29.6" W065° 37' 36.8"
	Test leads straight line past fire station	N18° 14' 32.1" W065° 37' 45.1"
	PI to airfield post	N18° 14' 35.8" W065° 37' 57.0"
	Straight line to valve Pit #10 at airfield	N18° 14' 39.0" W065° 38' 01.3"
	At valve Pit #10 airfield	N18° 14' 43.7" W065° 38' 06.9"

Other GPS Readings on 8" Pipeline Removal of Piping and Pits

	Pit #5	N18° 14' 34.0" W065° 37' 51.8"
	Pit #4	N18° 14' 36.0" W065° 37' 57.6"

12" JP-5 from PH 1982 to JP-5 Hill Pig Trap

PI at fence where goes into ground	N18° 13' 56.0" W065° 37' 13.7"
PI at road crossing to middle of road	N18° 13' 55.8" W065° 37' 13.7"
PI in middle of road	N18° 13' 55.5" W065° 37' 13.9"
Long straight	N18° 13' 57.9" W065° 37' 17.3"
Start of long PI	N18° 13' 59.4" W065° 37' 19.4"
In PI long sweeping	N18° 13' 59.9" W065° 37' 20.0"
PI long sweeping	N18° 14' 00.7" W065° 37' 20.9"
PI long sweeping	N18° 14' 01.3" W065° 37' 21.4"
PI long sweeping	N18° 14' 02.2" W065° 37' 21.7"
PI long sweeping	N18° 14' 03.1" W065° 37' 21.8"
End of PI; there are test leads	N18° 14' 03.9" W065° 37' 21.7"
Start of long sweeping PI	N18° 14' 12.1" W065° 37' 19.5"
Long sweeping PI	N18° 14' 13.3" W065° 37' 19.4"
Long sweeping PI across from Bldg. 377	N18° 14' 15.0" W065° 37' 19.3"
Long sweeping PI	N18° 14' 16.2" W065° 37' 19.7"
End of PI	N18° 14' 17.0" W065° 37' 20.2"
Short radius 90 PI	N18° 14' 21.6" W065° 37' 22.5"
At fence in Tank Farm	N18° 14' 21.8" W065° 37' 23.8"
PI to trap	N18° 14' 22.1" W065° 37' 24.7"

Time		First GPS Reading	Second GPS Reading
	3 ½ light poles down going east with \otimes 3 to mark	N18° 13' 44.8" W065° 36' 59.6"	N18° 13' 45.1" W065° 36' 59.6"
	Start of PI marked \overline{X} 3	N18° 13' 43.1" W065° 36' 56.9"	N18° 13' 43.3" W065° 36' 57.0"
	End of PI marked \overline{X} 4	N18° 13' 42.2" W065° 36' 56.8"	N18° 13' 42.4" W065° 36' 56.8"
	Marked with \otimes 4	N18° 13' 40.6" W065° 36' 54.4"	N18° 13' 40.8" W065° 36' 54.3"
	Start of PI marked \overline{X} 5	N18° 13' 38.8" W065° 36' 51.7"	N18° 13' 39.0" W065° 36' 51.8"
	Test leads	N18° 13' 38.4" W065° 36' 51.7"	N18° 13' 38.1" W065° 36' 51.7"
	End of PI \overline{X} 6	N18° 13' 38.4" W065° 36' 51.8"	N18° 13' 38.7" W065° 36' 51.7"
	Marked with \otimes 5	N18° 13' 33.5" W065° 36' 55.3"	N18° 13' 33.5" W065° 36' 55.5"
	PI on edge of road \overline{X} 7	N18° 13' 30.4" W065° 36' 57.6"	N18° 13' 30.5" W065° 36' 57.6"
	Concrete at blind flange in fuel pit	N18° 13' 29.6" W065° 36' 59.4"	N18° 13' 29.6" W065° 36' 59.3"
9:45 a.m.	Finished GPS pipeline; going to start over		
11:20 a.m.	Done with 12" pipeline		

JP5 - From VP 24 to Pier 3 Pump House 12"

Time		First GPS Reading	Second GPS Reading
8:00 a.m.	Valve at Building 192	N18° 13' 53.4" W065° 37' 11.8"	N18° 13' 53.5" W065° 37' 11.8"
	Start of PI	N18° 13' 53.7" W065° 37' 11.6"	N18° 13' 53.8" W065° 37' 11.7"
	End of PI	N18° 13' 53.7" W065° 37' 11.4"	N18° 13' 53.8" W065° 37' 11.6"
	Test leads	N18° 13' 52.5" W065° 37' 09.9"	N18° 13' 52.6" W065° 37' 09.8"
	Beside square manway at edge of road marked ⊗	N18° 13' 50.7" W065° 37' 07.1"	N18° 13' 50.8" W065° 37' 07.1"
	Edge of first road west of Building 371 ⊗ 1	N18° 13' 48.8" W065° 37' 04.5"	N18° 13' 49.0" W065° 37' 04.5"
	Edge of first road east side, Building 371 ⊗ 2	N18° 13' 48.5" W065° 37' 04.1"	N18° 13' 48.6" W065° 37' 04.1"
	Start of PI east of Building 371 Pier Access Road X	N18° 13' 47.5" W065° 37' 02.4"	N18° 13' 47.6" W065° 37' 02.5"
	End of PI east side of Pier Access Road X 1	N18° 13' 46.7" W065° 37' 02.1"	N18° 13' 46.8" W065° 37' 02.1"



**NAVAL FACILITIES ENGINEERING SERVICE CENTER
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J-26 Quality Control Checklist – Work Item Checklist



NAVSTA ROOSEVELT ROADS PROGRESS
7074-18



Mod	System	Location	Description	% Complete	Comments
1	JP-5, DFM	Pier 1A	Remove cross connection between DFM and JP-5 pipelines	100%	Connection installed, painting remaining
2	JP-5, DFM	Pier 1A	Install air eliminators on existing 2" vents on DFM and JP-5 pipelines near the cross connection. Install containment under vents.	100%	Drip pans removed from scope of work JP-5, DFM-P and DFM-S pipelines complete to valves.
3	ALL	VP 27	Replace stripper piping	100%	All valve installed. Pressure relief piping and painting remain.
4	ALL	Pier 1 and 1A	Replace valves at shore-end of Pier 1 and 1A	100%	Painting and x-ray remain.
5	ALL	Pier 1	Replace 8" valves at barge end of pier	100%	12-inch vertical pipe will be removed and 4-inch pipe capped
6	DFM-S	Near VP 27	Cut and remove blinded tee with pipe pup	100%	Touch-up painting and supports remain to be completed.
7	DFM-S	VP 25	Remove valve inside VP 25 and demolish pit	100%	Cap installed on DFM side. Awaiting fuels to drain N/S side. Pit demolished.
8	DFM-S	PH 466	Remove excess piping, valve and pumps and replace with flanged spool piece with drain, sample probe and pressure gauge.	100%	
9	DFM	VP 23	Removed blind flanged connections and weld on caps. Demolish pit	100%	
10	DFM	VP 24	Modify VP 24 to bring pipelines and valves above ground. Demolish pit.	100%	Touch-up painting remains
11	DFM-S	VP 9 Sec	Remove gate valves in VP 9 (secondary). Install welded elbow and cap. Demolish pit.	100%	New valve setting installed. Awaiting coating and backfill
12	DFM-S	VP 6	Purge and abandon DFM-S pipeline at VP 6. Install weld caps. Demolish pit.	100%	Complete
12	DFM-S	VP 7	Purge and abandon DFM-S pipeline at VP 7. Install weld caps. Demolish pit.	100%	Complete
13	JP-5	VP 2	Remove valves - replace with pipe pup	100%	Complete
13	JP-5	VP 3	Remove valve - install new valve	100%	New valves, pipe spools and drain valves complete
13	JP-5	VP 4	Remove valve - replace with pipe pup, cap pressure relief, demolish pit	100%	Complete
13	JP-5	VP 5	Remove valve - replace with pipe pup. Demolish pit.	100%	Complete
13	JP-5	VP 6	Remove (2) valves - replace with pipe pup on 8", cap 12" Keep low point drain.	60%	JP-5 8-inch complete
14	JP-5	VP 9	Remove (2) dresser couplings, (2) valves and tee - install new 8" and 12" valves and tee for receiver	100%	Complete
15	DFM	VP 56	Remove valves and fittings below ground - install 12" pipe pup below ground, install 6" valve above ground	100%	Coating and backfill remain. Complete. New flange had to be installed to fit valve.
15	JP-5	VP 10	Replace 12" valve	100%	Complete
15	JP-5	VP 11	Remove 6" and 12" valve - install blind flange at testing time	100%	Complete
15	JP-5	Tank 1082	Remove 6" valve - install blind flange	100%	Complete
15	JP-5	Tank 83	Replace 12" valve	100%	Complete
15	JP-5	Tank 381	Replace 6" valves in Tank 381	100%	Complete
15	JP-5, DFM	PH 1982	Replace (2) 16", (4) 12" valve and install (4) 12" skillets, install (2) new 10" valve parallel to 156 and 157 and remove meter piping	100%	All valves installed. Painting remains.
16			Remove "Blow-out Pit" on JP-5 pipeline located near DFM-S VP9 (Blow-out Pit).	100%	
17	JP-5	7A	Repair 2" low point drain	100%	
18	JP-5	VP 9A	Remove valves on 12" and 6" - install pipe and demolish	100%	Pit demolished
19	DFM-P	VP-8	Remove 18-inch valve setting and install new 12"-inch setting and piping. Cap 4" pipelines	100%	Fabrication, excavation and pit demolition complete
20	DFM-S	VP-8	Move TFD-141 above ground at DFM-S VP 8.	100%	Coating and backfill remain.
Pigging	JP-5	PH 1982	Install launcher/receiver	100%	Fabrication and painting near completion
Pigging	JP-5	VP 9	Install Launcher/receiver	100%	Fabrication and painting near completion, Excavation complete