



UCS JOB NO. S-4248

Section 3

Completed Signed /
JOB TRAVLER

JOB: S-4248-03

PROJECT SPECIFICATION

Job # J-447

PAGE 1 OF 3

PO# 4560757625

REV	DATE	BY	CHK	APV	REV	DATE	BY	CHK	APV
0	3/8/2016	JB							



A Honeywell Company

UOPR SF-009

FABRICATORS PIPING & STRUCTURE INSPECTION PLAN

HONEYWELL UOP RUSSELL PROCESS PLANTS FOR CRYO, REFRIGERATION, AMINE,

NOTE - The information in this document is confidential and the property of UOP LLC and must not be disclosed to others or reproduced in any manner or used for any purpose whatsoever without its written permission.

REVISION	DESCRIPTION
0	Fabricators Skid ITP



A Honeywell Company

UOPR SF-009

PROJECT SPECIFICATION

Job # J-447
PO# 4500757625 PAGE 2 OF 3

REV	DATE	BY	CHK	APV	REV	DATE	BY	CHK	APV
0	3/8/2016	JB							

FABRICATORS PIPING & STRUCTURE INSPECTION PLAN

HONEYWELL UOP RUSSELL PROCESS PLANTS FOR CRYO, REFRIGERATION, AMINE,

As a minimum, Fabricator shall review and inspect the Control Activities indicated below.

Fabricator shall provide inspectors (UOPR and Client) with Two (2) working days advance notice for inspection points (A1 and A2).

Fabricator shall provide UOPR QC with Two (2) working days written notification for hold points (H). E-mail is the preferred method of written notification.

Inspection Code:

- A1 – 100% Actual Inspection
- A2 – Random Inspection

- R1 – 100% Review of Documentation
- R2 – Random Review of Documentation

- H – Hold Point – do not proceed until inspection by party requesting the hold is complete.
- W – Witness Point – do not proceed until inspection by party requesting the witness point is Complete or (waived.)

- AP – Approval Required
- NA – Not Applicable

Control Activity	Governing Code or Specification	Required Inspections Initials and Date			
		Fabricator/ vendor	UOPR	Client	A.I/3 rd party
Fabrication Inspection and Testing plan					
Review fabrication isometric drawings and PO Clarification SOP.	UOPR SOP-001 P&IDs ENG-14cf ENG-14ca ENG-14cas	R1 <i>P</i> 1/23	R1		
Review WPS's and PQR's	ENG-14cam ENG-13ap UOPR Quality Control Manual ASME D1.1 Weld Maps ASME Sec. IX	<i>P</i> 1/23	R1		

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A Honeywell Company

UOPR SF-009

FABRICATORS PIPING & STRUCTURE INSPECTION PLAN

HONEYWELL UOP RUSSELL PROCESS PLANTS FOR CRYO, REFRIGERATION, AMINE,

PROJECT SPECIFICATION

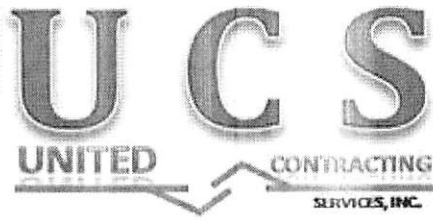
Job # J-447
PO # 4500757625

PAGE 3 OF 3

REV	DATE	BY	CHK	APV	REV	DATE	BY	CHK	APV
0	3/8/2016	JB							

Control Activity	Governing Code or Specification	Required Inspections Initials and Date			
		Fabricator/ vendor	UOPR	Client	A.I./3rd party
VT/Dimensional check of skid top (Done on Ground).	AWS D1.1 ENG-14de	A1 N/A	H		
Visually examine weld quality and dimensional check of ALL structural components.	AWS D1.1	A1 N/A	A1, H, A2		
Verify trial fit of upper and lower stacked skid structures, ladders, platforms, stairs, handrails and any additional bolt on attachments.		H, A1 N/A	H, A1		
Visually examine piping weld quality.	ENG-13aae ASME B-31.3	A1 P 5/1	A1, H P 5/1		6-7-17
Conduct dimensional piping and fitting orientation check.	Structural Steel Plan, Elevation and Isometric drawings	H, A1 P 5/1	H, A1 P 5/1		
Review radiographs and NDE test reports	ASME B-31.3	R1 P 6/6	R1 P 6/6		NDE Reports only
Witness pressure testing of piping. Verify pressure test results. Chart Required.	Line List ENG-13aae ASME B-31.3 HUR-1000	N/A	A1, R1		
Review skid documentation / data book.	ENG-13aae	R1 P 6/6	R1, A1 P 6/6		6-7-17

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UCS JOB NO. S-4248

Section 7

NDE RECORDS & TRACEABILITY RECORDS

(WID, HT, & NDE Maps)

JOB: S-4248-03



RADIOGRAPHIC INSPECTION REPORT

Gamma Type: IR 192	Film Brand: AGFA	Client: UCS	Date: 03-Feb-17
Curies: 80	Film Type: D3	IRISNDT #: 0522	Job #: S-4248-03
EFSS: .149"	#Film/cassette: 1/1	Location: TULSA,OK	PO #:
Code: B31.3		Item Inspected: PIPING	
Material: S/S			

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Technique	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cccept (R)eject
XR1	T-2	10" .365"	JG	BF	10.385"	.365"	2-4	RT 3		A
	2-3									A
	3-T									A
XR2	T-2	4" .120"	JP	10F	4.380"	.120"	2-4	RT 3		A
	2-3									A
	3-T									A
XR3	T-2	10" .365"	JP	BF	10.385"	.365"	2-4	RT 3		A
	2-3									A
	3-T									A

RT Techniques: Exposure Viewing Technique S.W.E S.W.V 1,2,2A,6,7 D.W.E S.W.V 3,3A D.W.E D.W.V 4,5,8	S.O.D. = Source-to-object distance O.F.D. = Distance from source side of object to film	AB - Arc Burns BT - Burn Through CK - Crack EP - Excessive Penetration P - Porosity EI - Elongated Indication	EUC - External Undercut IUC - Internal Undercut HB - Hollow Bead IP - Incomplete Penetration S - Slag	IC - Internal Concavity LF - Lack of Fusion LC - Low Cover MA - Misalignment TI - Tungsten Inclusion
--	--	--	---	--

Unit#: 716 Miles: _____ In: _____ Out: _____ Hrs: _____ In: _____ Out: _____ Hrs: _____ Personnel: C. BROOKHART S. ANDERSON	Film Quantity: <table border="1"> <tr> <td>3</td> <td>(3 1/2 x 8 1/2)</td> <td>D3</td> </tr> <tr> <td>6</td> <td>(3 1/2 x 17)</td> <td>IX-80</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	3	(3 1/2 x 8 1/2)	D3	6	(3 1/2 x 17)	IX-80																						Interpretation by: CHRIS BROOKHART SNT-TC-1A: II (Print) ASNT: _____ (Level) CERT #: 1067 (Signature) Client Representative: _____ (Print) TWD I am in full agreement with report contents (Sign)
3	(3 1/2 x 8 1/2)	D3																											
6	(3 1/2 x 17)	IX-80																											

Houston, TX (713) 722-7177	Tulsa, OK (918) 446-8773	Griffith, IN (219) 923-6501
Corpus Christi, TX (361) 888-4700	Mobile, AL (251) 660-0024	Texas City, TX (409) 945-2662
Deer Park, TX (281) 476-4444	Beaumont, TX (409) 727-2400	New Orleans, LA (504) 328-0070
Stanton, CA (714) 861-4058	Denver, CO (303) 289-5253	Claremore, OK (918) 343-1420
North Houston, TX (713) 446-0200		West Berlin, NJ (856) 809-0270

www.irisndt.com

IRIS NDT

RADIOGRAPHIC INSPECTION REPORT

Gamma Type: IR 192	Film Brand: FUJI, Agfa	Client: United Contracting Services	Date: 2/10/2017
Curies: 74	Film Type: 80. D3	Job#: S-4248	IRISNDT#: 623
EFSS: 0.14	#Film/Cassette: 1	Location: Tulsa, OK	PKG#: _____
Code: B31.3	Material: Carbon Steel, Stainless Steel	Item Inspected: Spool Piping	

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Tech.	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XR4	T-2	6" .280"	JG	15	6.625"	.280"	2-4	RT-3		A
	2-3									A
	3-T									A
XR5	T-2	3" .120"	JP	10	3.5"	.120"	2-4	RT-3		A
	2-3									A
	3-T									A
XR6	T-2	6" .280"	JG	15	6.625"	.280"	2-4	RT-3		A
	2-3									A
	3-T									A
XR7	T-2	6" .280"	LF	B	6.625"	.280"	2-4	RT-3	CLUSTER POROSITY	R
	2-3									A
	3-T									R
XR8	T-2	6" .280"	LF	B	6.625"	.280"	2-4	RT-3		A
	2-3									A
	3-T									A
XR9	T-2	4" .120"	LC	10	4.5"	.120"	2-4	RT-3		A
	2-3									A
	3-T									A
XR10	T-2	6" .432"	ML	15	6.625"	.432"	2-4	RT-3		A
	2-3									A
	3-T									A
XR11	T-2	6" .432"	SC	15	6.625"	.432"	2-4	RT-3		A
	2-3									A
	3-T									A
XR12	T-2	6" .432"	JP	15	6.625"	.432"	2-4	RT-3		A
	2-3									A
	3-T									A
										R
XR-13	T-2	8" .322"	JG	B	8.625"	.322"	2-4	RT-3		A
	2-3									A
	3-T									A

RT Technique: Exposure Viewing Technique S.O.D. = Source-to-object distance O.F.D. = Distance from source side of object to film

AB - Arc Burns
BT - Burn Through
CK - Crack
EP - Excessive Penetration
P - Porosity
EL - Elongated Indication

EUIC - External Undercut
IUC - Internal Undercut
HB - Hollow Bead
IP - Incomplete Penetration
S - Slag

IC - Internal Concavity
LF - Lack of Fusion
LC - Low Cover
MA - Misalignment
TI - Tungsten Inclusion

Unit# 395 Miles	Film Quantity:	Interpretation by:
In: _____ Out: _____ Hrs _____	3 1/2 x 8 1/2/10 21	Daniel Culver
In: _____ Out: _____ Hrs _____	3 1/2 x 17 9	(PRINT) _____
Personnel: Daniel Culver	4 1/2 x 8 1/2/10	(Signature) _____
Lucas Atwell	4 1/2 x 17	Client Representative
	7 x 17	I am in full agreement (Print)
	14 x 17	with report contents (Sign)
	8 x 10	

Houston, TX (713) 722-7177	Tulsa, OK (918) 446-8773	Griffith, IN (219) 923-6501
Corpus Christi, TX (361) 888-4700	Mobile, AL (251) 680-0024	Texas City, TX (409) 945-2562 (504)
Deer Park, TX (281) 476-4444	Beaumont, TX (409) 727-2400	Orleans, LA 328-0070 (918) 343-
Stanton, CA (714) 861-4058	Denver, CO (303) 289-5253	Claremore, OK 1420 (856) 809--
North Houston, TX (713) 446-0200		West Berlin, NJ 0270

IRIS NDT

RADIOGRAPHIC INSPECTION REPORT

Gamma Type: IR 192	Film Brand: FUJI, Agfa	Client: United Contracting Services	Date: 2/10/2017
Curies: 74	Film Type: 80. D3	Job#: S-4248	IRISNDT#: 623
EFSS: 0.14	#Film/Cassette: 1	Location: Tulsa, OK	PKG#: _____
Code: B31.3	Material: Carbon Steel, Stainless Steel	Item Inspected: Spool Piping	

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Tech.	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XR14	T-2	6" .280"	ML	15	6.625"	.280"	2-4	RT-3		A
	2-3									A
	3-T									A
XR15	T-2	6" .280"	JP	15	6.625"	.280"	2-4	RT-3		A
	2-3									A
	3-T									A
XR16	T-2	6" .280"	JP	15	6.625"	.280"	2-4	RT-3		A
	2-3									A
	3-T									A
XR17	T-2	6" .280"	JP	15	6.625"	.280"	2-4	RT-3		A
	2-3									A
	3-T									A
XR18	T-2	6" .280"	SG	15	6.625"	.280"	2-4	RT-3		A
	2-3									A
	3-T									A
XR19	T-2	4" .120"	LC	10	4.5"	.120"	2-4	RT-3	IF	R
	2-3									A
	3-T								IF	R
XR20	T-2	6" .280"	SM	15	6.625"	.280"	2-4	RT-3		A
	2-3									A
	3-T									A
XR21	A	2" .154"	EM	12	18"	2.375"	2-4	RT-4		A
	B									A

RT Technique: Exposure Viewing Technique S.O.D. = Source-to-object distance O.F.D. = Distance from source side of object to film

AB - Arc Burns
BT - Bum Through
CK - Crack
EP - Excessive Penetration
P - Porosity
EL - Elongated Indication

EUIC - External Undercut
IUC - Internal Undercut
HB - Hollow Bead
IP - Incomplete Penetration
S - Slag

IC - Internal Concavity
LF - Lack of Fusion
LC - Low Cover
MA - Misalignment
TI - Tungsten Inclusion

Unit# 395 Miles _____	Film Quantity:	Interpretation by:
In: _____ Out: _____ Hrs _____	3 1/2 x 8 1/2 /10 23	Daniel Culver
In: _____ Out: _____ Hrs _____	3 1/2 x 17	(PRINT)
Personnel: Daniel Culver	4 1/2 x 8 1/2 /10	SNT-TC-1A II
Lucas Atwell	4 1/2 x 17	CGSB ASNT Cert # 341
	7 x 17	Client Representative
	14 x 17	I am in full agreement with report contents (Print) (Sign)
	8 x 10	

Houston, TX (713) 722 - 7177	Tulsa, OK (918) 446 - 8773	Griffith, IN (219) 923 - 6501
Corpus Christi, TX (361) 888 - 4700	Mobile, AL (251) 660 - 0024	Texas City, TX New (409) 945 - 2662 (504)
Deer Park, TX (281) 476 - 4444	Beaumont, TX (409) 727 - 2400	Orleans, LA 328 - 0070 (918) 343 -
Stanton, CA (714) 861 - 4058	Denver, CO (303) 289 - 5253	Claremore, OK 1420 (856) 809 -
North Houston, TX (713) 446 - 0200		West Berlin, NJ 0270

IRIS NDT

RADIOGRAPHIC INSPECTION REPORT

Gamma Type: IR 192	Film Brand: FUJI, AGFA	Client: United Contracting Services	Date: 2/17/2017
Curies: 95	Film Type: 80, D3	Job#: S-4248	IRISNDT#: 725
EFSS: 0.146"	#Film/Cassette: 1	Location: Tulsa, OK	PKG#: _____
Code: B31.3 NFS	Material: Carbon Steel, Stainless Steel	Item Inspected: spool piping	

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Tech.	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XR18R	3-T	6" .432"	JP	15F	6.62"	.432"	2-4			A
XR19R	T-2	4" .120"	LC, EM	10F	4.5"	.120"	2-4		IF	R
	3-T								IF	R
XR22	T-2	6" .432"	ML	15F	6.62"	.432"	2-4			A
	2-3									A
	3-T									A
XR23	T-2	8" .500"	JP	BF	8.62"	.500"	2-4			A
	2-3									A
	3-T									A
XR25	T-2	6" .280"	JP	15F	6.62"	.280"	2-4			A
	2-3									A
	3-T									A
XR26	T-2	6" .432"	JP	15F	6.62"	.432"	2-4			A
	2-3									A
	3-T									A
XR27	T-2	6" .432"	JP	15F	6.62"	.432"	2-4			A
	2-3									A
	3-T									A
XR28	T-2	8" .500"	LF	BF	8.62"	.500"	2-4			A
	2-3									A
	3-T									A
XR30	T-2	4" .237"	LC	12F	4.5"	.237"	2-4			A
	2-3								RESHOOT, CRACKED SCREEN	R
	3-T									A
XR31	T-2	6" .280"	LC	15F	6.62"	.280"	2-4			A
	2-3									A
	3-T									A
XR32	T-2	3" .216"	SM	12F	3.5"	.216"	2-4			A
	2-3		SLAG							A
	3-T								ROOT POROSITY	R

RT Technique: Exposure Viewing Technique S.O.D. = Source-to-object distance O.F.D. = Distance from source side of object to film

AB - Arc Burns BT - Burn Through CK - Crack EP - Excessive Penetration P - Porosity EL - Elongated Indication

EUC - External Undercut IUC - Internal Undercut HB - Hollow Bead IP - Incomplete Penetration S - Slag

IC - Internal Concavity LF - Lack of Fusion LC - Low Cover MA - Misalignment TI - Tungsten Inclusion

Unit# 395	Miles _____	Film Quantity:	Interpretation by:
In: _____	Out: _____ Hrs _____	3 1/2 x 8 1/2 /10 24	Daniel Culver SNT-TC-1A II
In: _____	Out: _____ Hrs _____	3 1/2 x 17 6	CGSB
		4 1/2 x 8 1/2 /10	ASNT
		4 1/2 x 17	Cert # 341
Personnel: Daniel Culver		7 x 17	Client Representative
Ben Hunnicut		14 x 17	I am in full agreement (Print)
		8 x 10	with report contents (Sign)

IRIS NDT

RADIOGRAPHIC INSPECTION REPORT

Gamma Type: IR 192	Film Brand: FUJI, AGFA	Client: United Contracting Services	Date: 2/22/2017
Curies: 92	Film Type: 80, D3	Job#: S-4248	IRISNDT#: 789
EFSS: 0.146"	#Film/Cassette: 1	Location: Tulsa, OK	PKG#: _____
Code: B31.3 NFS	Material: Carbon Steel, Stainless Steel	Item Inspected: spool piping	

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Tech.	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XR19R	T-2	4" .120"	LC EM 4/10	10F	4.5"	.120"	2-4	RT3		A
	2-3									A
	3-T									A
XR35R	T-2	3" .216"	SM	12F	3.5"	.216"	2-4	RT3		A
	2-3									A
	3-T									A
XR36R	T-2	3" .216"	SM	12F	3.5"	.216"	2-4	RT3		A
	2-3									A
	3-T									A
XR44R	A	2" .109"	EM	12	18"	2.375"	2-4	RT4		A
	B									A
XR45R	A	2" .109"	EM	12	18"	2.375"	2-4	RT4	POR-OK	A
	B									A
XR53R	T-2	3" .216"	SG	12F	3.5"	.216"	2-4	RT3		A
	2-3									A
	3-T									A
XR54R	T-2	4" .237"	SG	12F	4.5"	.237"	2-4	RT3	IF, SLAG	R
	2-3									A
	3-T									A
XR63	T-2	3" .216"	SG	12F	3.5"	.216"	2-4	RT3	IF, SLAG	R
	2-3								IF, SLAG	R
	3-T									A
XR-64	T-2	3" .216"	SG	12F	3.5"	.216"	2-4	RT3		A
	2-3									A
	3-T								POR	R
XR69	A	2" .109"	EM	12	18"	2.375"	2-4	RT4		A
	B									A
XR70	A	2" .109"	EM	12	18"	2.375"	2-4	RT4		A
	B									A

RT Technique: Exposure Viewing Technique S.O.D. = Source-to-object distance O.F.D. = Distance from source side of object to film

AB - Arc Burns
BT - Burn Through
CK - Crack
EP - Excessive Penetration
P - Porosity
EL - Elongated Indication

EUIC - External Undercut
IUC - Internal Undercut
HB - Hollow Bead
IP - Incomplete Penetration
S - Slag

IC - Internal Concavity
LF - Lack of Fusion
LC - Low Cover
MA - Misalignment
TI - Tungsten Inclusion

Unit# 395 Miles	Film Quantity:	Interpretation by:
In: _____ Out: _____ Hrs: _____	3 1/2 x 8 1/2 / 10 29	Daniel Culver
In: _____ Out: _____ Hrs: _____	3 1/2 x 17	(PRINT)
	4 1/2 x 8 1/2 / 10	
	4 1/2 x 17	(Signature)
Personnel: Daniel Culver	7 x 17	Client Representative
Casey McDaniel	14 x 17	I am in full agreement with report contents
	8 x 10	(Print)
		(Sign)

IRIS NDT

RADIOGRAPHIC INSPECTION REPORT

Gamma Type: IR 192	Film Brand: FUJI, AGFA	Client: United Contracting Services	Date: 2/17/2017
Curies: 95	Film Type: 80, D3	Job#: S-4248	IRISNDT#: 725
EFSS: 0.146"	#Film/Cassette: 1	Location: Tulsa, OK	PKG#: _____
Code: B31.3 NFS		Item Inspected: pool piping	
Material: Carbon Steel, Stainless Steel			

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Tech.	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XR33	T-2	3" .216"	SM	12F	3.5"	.216"	2-4			A
	2-3									A
	3-T									A
XR35	T-2	3" .216"	SM	12F	3.5"	.216"	2-4		POROSITY	R
	2-3									A
	3-T									A
XR36	T-2	3" .216"	SM	12F	3.5"	.216"	2-4		SUCKBACK, IF	R
	2-3								IF	R
	3-T								SUCKBACK, IF	R
XR37	T-2	6" .280"	LF	15F	6.62"	.280"	2-4			A
	2-3									A
	3-T									A
XR38	T-2	6" .280"	JP	15F	6.62"	.280"	2-4			A
	2-3									A
	3-T									A
XR39	T-2	6" .432"	ML	15F	6.62"	.432"	2-4			A
	2-3									A
	3-T									A
XR40	T-2	10" .375"	SG	BF	10.75"	.375"	2-4			A
	2-3									A
	3-T									A
XR41	T-2	10" .375"	SG	BF	10.75"	.375"	2-4			A
	2-3									A
	3-T								IF	R
XR42	T-2	10" .375"	FO	BF	10.75"	.375"	2-4			A
	2-3									A
	3-T									A
XR43	A	2" .120"	EM	12	18"	2.375"	2-4			A
	B									A

RT Technique: Exposure Viewing Technique S.W.E. S.W.V. 1,2,2A,6,7 D.W.E. S.W.V. 3, 3A D.W.E. D.W.V. 4, 5, 8	S.O.D. = Source-to-object distance O.F.D. = Distance from source side of object to film	AB - Arc Burns BT - Burn Through CK - Crack EP - Excessive Penetration P - Porosity EL - Elongated Indication	EUC - External Undercut IUC - Internal Undercut HB - Hollow Bead IP - Incomplete Penetration S - Slag	IC - Internal Concavity LF - Lack of Fusion LC - Low Cover MA - Misalignment TI - Tungsten Inclusion
---	--	--	---	--

Unit# 395 Miles	Film Quantity:	Interpretation by:
In: _____ Out: _____ Hrs: _____	3 1/2 x 8 1/2 /10 20	Daniel Culver SNT-TC-1A II
In: _____ Out: _____ Hrs: _____	3 1/2 x 17 9	(PRINT) CGSB
	4 1/2 x 8 1/2 /10	(Signature) ASNT
	4 1/2 x 17	Cert # 341
Personnel: Daniel Culver	7 x 17	Client Representative
Ben Hunnicut	14 x 17	I am in full agreement (Print)
	8 x 10	with report contents (Sign)

IRIS NDT

RADIOGRAPHIC INSPECTION REPORT

PAGE 3

Gamma Type: IR 192	Film Brand: FUJI, AGFA	Client: United Contracting Services	Date: 2/22/2017
Curies: 92	Film Type: 80, D3	Job#: S-4248	IRISNDT#: 789
EFSS: 0.146"	#Film/Cassette: 1	Location: Tulsa, OK	PKG#: _____
Code: B31.3 NFS	Material: Carbon Steel, Stainless Steel	Item Inspected: spool piping	

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Tech.	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XR29	T-2	8" .300"	LF	BF	8.625"	.500"	2-4	RT3		A
	2-3									A
	3-T									A
XR34	T-2	10" .375	JP	BF	10.375"	.375"	2-4	RT3		A
	2-3									A
	3-T									A
XR46	T-2	8" .322"	JG	BF	8.625"	.322"	2-4	RT3		A
	2-3								RESHOOT	R
	3-T								RESHOOT	R
XR54	T-2	10" .375	JP	BF	10.375"	.375"	2-4	RT3		A
	2-3									A
	3-T									A
XR56	T-2	10" .375	JP <i>LF</i>	BF	10.375"	.375"	2-4	RT3		A
	2-3									A
	3-T									A
XR58	T-2	8" .500"	JP	BF	8.625"	.500"	2-4	RT3		A
	2-3									A
	3-T									A
XR59	T-2	8" .500"	SM	BF	8.625"	.500"	2-4	RT3		A
	2-3									A
	3-T									A
XR60	T-2	8" .500"	JG	BF	8.625"	.500"	2-4	RT3		A
	2-3									A
	3-T									A
XR61	T-2	8" .500"	SG	BF	8.625"	.500"	2-4	RT3		A
	2-3								POROSITY	R
	3-T									A
XR62	T-2	8" .322"	SG	BF	8.625"	.322"	2-4	RT3		A
	2-3									A
	3-T									A

RT Technique:
 Exposure Viewing Technique
 S.W.E. S.W.V. 1,2,2A,6,7
 D.W.E. S.W.V. 3, 3A
 D.W.E. D.W.V. 4, 5, 8

S.O.D. = Source-to-object distance
 O.F.D. = Distance from source side of object to film

AB - Arc Burns
 BT - Burn Through
 CK - Crack
 EP - Excessive Penetration
 P - Porosity
 EL - Elongated Indication

EUC - External Undercut
 IUC - Internal Undercut
 HB - Hollow Bead
 IP - Incomplete Penetration
 S - Slag

IC - Internal Concavity
 LF - Lack of Fusion
 LC - Low Cover
 MA - Misalignment
 TI - Tungsten Inclusion

Unit# 395 Miles	Film Quantity:	Interpretation by:
In: _____ Out: _____ Hrs _____	3 1/2 x 8 1/2 /10	Daniel Culver
In: _____ Out: _____ Hrs _____	3 1/2 x 17 30	SNT-TC-1A II
	4 1/2 x 8 1/2 /10	UGSB
	4 1/2 x 17	ASNT
Persönnel: Daniel Culver	7 x 17	Cert # 341
Casey McDaniel	14 x 17	
	8 x 10	
		I am in full agreement with report contents (Print) (Sign)

Houston, TX
 Corpus Christi, TX
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 Stanton, CA
 North Houston, TX

(713) 722 - 7177
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 Mobile, AL
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 West Berlin, NJ

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 New (409) 945 - 2662 (504)
 328 - 0070 (918) 343 -
 1420 (856) 809 -
 0270

IRIS NDT

RADIOGRAPHIC INSPECTION REPORT

Gamma Type: IR 192	Film Brand: FUJIFILM	Client: United Contracting Services	Date: 2/17/2017
Curies: 95	Film Type: 80,D3	Job#: S-4248	IRISNDT#: 725
EFSS: 0.146"	#Film/Cassette: 1	Location: Tulsa, OK	PKG#: _____
Code: B31.3 NFS	Material: Carbon Steel, Stainless Steel	Item Inspected: _____	spool piping

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Tech.	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)reject
XR44	A	2" .120"	EM	12	18"	2.375"	2-4		POROSITY	R
	B								POROSITY	R
XR45	A	2" .120"	EM	12	18"	2.375"	2-4		POROSITY	R
	B								POROSITY	R
XR47	T-2	8" .500"	LF	BF	8.62"	.500"	2-4			A
	2-3									A
	3-T									A
XR48	T-2	6" .432"	JP	15F	6.62"	.432"	2-4			A
	2-3									A
	3-T									A
XR49	T-2	8" .322"	SM	BF	8.62"	.322"	2-4			A
	2-3									A
	3-T									A
XR50	T-2	3" .216"	SG	12F	3.5"	.216"	2-4			A
	2-3									A
	3-T									A
XR51	T-2	8" .322"	ML	BF	8.62"	.322"	2-4			A
	2-3									A
	3-T									A
XR52	T-2	8" .322"	JP	BF	8.62"	.322"	2-4			A
	2-3									A
	3-T									A
XR53	T-2	3" .216"	SG	12F	3.5"	.216"	2-4			A
	2-3								ROOT POROSITY	R
	3-T									A

RT Technique: Exposure Viewing Technique S.W.E. S.W.V. 1,2,2A,8,7 D.W.E. S.W.V. 3, 3A D.W.E. D.W.V. 4, 5, 8	S.O.D. = Source-to-object distance O.F.D. = Distance from source side of object to film	AB - Arc Burns BT - Burn Through CK - Crack EP - Excessive Penetration P - Porosity EL - Elongated Indication	EUIC - External Undercut IUC - Internal Undercut HB - Hollow Bead IP - Incomplete Penetration S - Slag	IC - Internal Concavity LF - Lack of Fusion LC - Low Cover MA - Misalignment TI - Tungsten Inclusion
--	--	--	--	--

Unit# 395 Miles	Film Quantity:	Interpretation by:
In: _____ Out: _____ Hrs: _____	3 1/2 x 8 1/2 /10 16	Daniel Culver SNT-TC-1A II
In: _____ Out: _____ Hrs: _____	3 1/2 x 17 12	(Signature) CGSB
	4 1/2 x 8 1/2 /10	ASNT
	4 1/2 x 17	Cert # 341
Personnel: Daniel Culver	7 x 17	Client Representative
Ben Hunnicut	14 x 17	I am in full agreement (Print)
	8 x 10	with report contents (Sign)



RADIOGRAPHIC INSPECTION REPORT

Gamma Type: IR 192	Film Brand: FUJI, AGFA	Client: United Contracting Services	Date: 2/22/2017
Curies: 92	Film Type: 80, D3	Job#: S-4248	IRISNDT#: 789
EFSS: 0.146"	#Film/Cassette: 1	Location: Tulsa, OK	PKG#:
Code: B31.3 NFS	Material: Carbon Steel, Stainless Steel	Item Inspected: spool piping	

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Tech.	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XR71	A	2" .109"	EM	12	18"	2.375"	2-4	RT4	POR-OK	A
	B								POR-OK	A
XR72	A	2" .109"	EM	12	18"	2.375"	2-4	RT4		A
	B									A
XR74	T-2	3" .216"	SM	12F	2.5"	.216"	2-4	RT3		A
	2-3									A
	3-T									A
XR55	T-2	6" .280"	SM	15F	6.625"	.280"	2-4	RT3		A
	2-3									A
	3-T									A
XR65	T-2	6" .432"	SM	15F	6.625"	.432"	2-4	RT3	CONCAVITY	R
	2-3									R
	3-T								IP, CONCAVITY	R
XR66	T-2	6" .432"	SM	15F	6.625"	.432"	2-4	RT3		A
	2-3									A
	3-T									A
XR67	T-2	6" .432"	SM	15F	6.625"	.432"	2-4	RT3		A
	2-3									A
	3-T									A
XR68	T-2	6" .432"	SM	15F	6.625"	.432"	2-4	RT3		A
	2-3									A
	3-T									A
XR73	T-2	8" .500"	LF	BF	8.625"	.500"	2-4	RT3		A
	2-3								POR-OK	A
	3-T									A
XR24	T-2	8" .500"	FO	BF	8.625"	.500"	2-4	RT3		A
	2-3									A
	3-T									A

RT Technique: Exposure Viewing Technique S.O.D. = Source-to-object distance O.F.D. = Distance from source side of object to film

AB - Arc Burns
BT - Burn Through
CK - Crack
EP - Excessive Penetration
P - Porosity
EL - Elongated Indication

EUIC - External Undercut
IUC - Internal Undercut
HB - Hollow Bead
IP - Incomplete Penetration
S - Slag

IC - Internal Concavity
LF - Lack of Fusion
LC - Low Cover
MA - Misalignment
TI - Tungsten Inclusion

Unit# 395 Miles	Film Quantity:	Interpretation by:
In: _____ Out: _____ Hrs _____	3 1/2 x 8 1/2 /10 22	Daniel Culver SNT-TC-1A II
In: _____ Out: _____ Hrs _____	3 1/2 x 17 6	(Signature) _____ CGSB ASNT Cert # 341
Personnel: Daniel Culver	4 1/2 x 8 1/2 /10	Client Representative
Casey McDaniel	4 1/2 x 17	I am in full agreement with report contents (Print) (Sign)
	7 x 17	
	14 x 17	
	8 x 10	

Houston, TX (713) 722 - 7177	Tulsa, OK (918) 446 - 8773	Griffith, IN (219) 923 - 6501
Corpus Christi, TX (361) 888 - 4700	Mobile, AL (251) 660 - 0024	Texas City, TX New (409) 945 - 2662 (504)
Deer Park, TX (281) 476 - 4444	Beaumont, TX (409) 727 - 2400	Orleans, LA 328 - 0070 (918) 343 -
Stanton, CA (714) 861 - 4058	Denver, CO (303) 289 - 5253	Claremore, OK 1420 (856) 809 -
North Houston, TX (713) 446 - 0200		West Berlin, NJ 0270

Gamma Type: IT992 Film Brand: Fuji Agf
 Curies: 80 Film Type: ED D3
 EFSS: 14 #Film/cassette: 11
 Code: 831.3
 Material: _____

Client: UCS Date: 3-2-17
 Job #: 4248 IRISNDT #: 0941
 Location: Tulsa P.O. #: _____
 Item Inspected: _____

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Technique	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XL32R	3 T	3" .216	SG	12F	3 1/2"	216	2.4	TS		A
XL46	2 3	8" .322	JB	BF	8 7/8"	322				A
XL57R	2 1	4" .287	SG	12F	4 1/2"	287			P	R
XL61R	2 3	10" .365	SG	BF	10 3/4"	365				A
XL63R	2 3	4" .337	SG	15F	4 1/2"	337				A
XL64R	3 T		SG						P	R
XL65R	2 3	6" .280	Sim	BF	6 7/8"	280				A
XL71R	2 3	8" .337	Sim	BF	4 1/2"	337			Light Leak	A
XL78	2 3	4" .337	Sim	BF	4 1/2"	337				A
XL79	2 3	8" .337	SG	BF	8 7/8"	337				A
XL80	2 3	2" .216	ML	12F	2 7/8"	216				A
XL81	2 3	4" .337	SG	BF	4 1/2"	337			P	A
									P OK per code	A

RT Techniques:

Exposure Viewing Technique
 S.W.E S.W.V 1, 2, 2A, 6, 7
 D.W.E S.W.V 3, 3A
 D.W.E D.W.V 4, 5, 8

S.O.D. = Source-to-object distance
 O.F.D. = Distance from source side of object to film

AB - Arc Burns
 BT - Burn Through
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 EP - Excessive Penetration
 P - Porosity
 EI - Elongated Indication

EUC - External Undercut
 IUC - Internal Undercut
 HB - Hollow Bead
 IP - Incomplete Penetration
 S - Slag

IC - Internal Concavity
 LF - Lack of Fusion
 LC - Low Cover
 MA - Misalignment
 TI - Tungsten Inclusion

Unit#: 760 Miles: _____
 In: _____ Out: _____ Hrs: _____
 In: _____ Out: _____ Hrs: _____
 Personnel: Chris Combs
Dean Low

Film Quantity:

3 1/2 x 8 1/2 /10	
3 1/2 x 17	
4 1/2 x 8 1/2 /10	
4 1/2 x 17	
7 x 17	
14 x 17	
8 x 10	

Interpretation by:

Chris Combs
 (Print)

[Signature]
 (Signature)

Client Representative:
 (Print)

I am in full agreement with report contents
 (Sign)

SNT-TC-1A [Signature]
 ASNT [Signature]
 (Level)
 CERT # 1054

Gamma Type: T-92 Film Brand: Fuji Age Client: UCS Date: 3-2-17
 Curies: 83 Film Type: 80 D3 Job #: 4248 IRISNDT #: 0941
 EFSS: 14 #Film/cassette: 1 Location: Tulsa P.O. #:
 Code: B313 Item Inspected:
 Material:

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Technique	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XRE2	1	8" 365	FO	BF	57"	57"	2.11	ES		A
XRE3	1	4" 337	FO	BF	12"	12"	2.37	ES		A
XRE4	1	10" 365	SG	BF	13 1/4	365			P	R
	2									A
	3								Light Leak	A
XRE5	1		SG							A
	2									A
	3								P ok per codes	A
XRE6	1		SG							A
	2									A
	3									A
XRE7	1		SG							R
	2									A
	3									A
XRE8	1	4" 237	SG	BF	4 1/2"	237				A
	2									A
	3									A
XRE9	1	6" 280	SG	BF	6 3/8"	280				A
	2									A
	3									A
XRE10	1	8" 365	SG	BF	57"	57"	2.11	ES		R
	2									A
	3									A

RT Techniques:
 Exposure S.W.E S.W.V 1, 2, 2A, 6, 7
 Viewing S.W.V 3, 3A
 Technique D.W.E S.W.V 3, 3A
 D.W.E D.W.V 4, 5, 8

S.O.D. = Source-to-object distance
 O.F.D. = Distance from source side of object to film

AB - Arc Burns
 BT - Burn Through
 CK - Crack
 EP - Excessive Penetration
 P - Porosity
 EI - Elongated Indication

EUC - External Undercut
 IUC - Internal Undercut
 HB - Hollow Bead
 IP - Incomplete Penetration
 S - Slag

IC - Internal Concavity
 LF - Lack of Fusion
 LC - Low Cover
 MA - Misalignment
 TI - Tungsten Inclusion

Unit#: 260 Miles: _____
 In: _____ Out: _____ Hrs: _____
 In: _____ Out: _____ Hrs: _____
 Personnel: Chris Carl
Dean Law

Film Quantity:
 3 1/2 x 8 1/2 / 10 _____
 3 1/2 x 17 _____
 4 1/2 x 8 1/2 / 10 _____
 4 1/2 x 17 _____
 7 x 17 _____
 14 x 17 _____
 8 x 10 _____

Interpretation by:
Chris Carl SNT-TC-1A
 (Print) _____ ASNT
 _____ (Level)
 _____ CERT # 104
 (Signature)
 Client Representative: _____
 (Print) _____
 I am in full agreement with report contents
 (Sign) _____

IRIS NDT

RADIOGRAPHIC INSPECTION REPORT

274480

Page 3 of 5

Gamma Type: TR2 Film Brand: Fujifilm Client: UCS Date: 3-2-17
 Curies: 80 Film Type: 80 DS Job #: 4248 IRISNDT #: 0941
 EFSS: 14 #Film/cassette: 41 Location: Tulsa P.O. #:
 Code: B31.3 Item Inspected:
 Material:

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Technique	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)eject
XR91	1 2	3" 216	SM	12F	32"	216			Light leak	A
XR92	1 2	3" 216	SM	12F	32"	216			Light leak	A
	2 3									
	3 1									
XR93	1 2	2" 216	SM		276	216			BT	R
	2 3									A
	3 1									A
XR94	1 2	3" 216	SM	12F	32"	216			Light leak	A
	2 3									
	3 1									
XR95	1 2	3" 216	SM	12F	32"	216			Light leak	A
	2 3									
	3 1									
XR96	1 2	3" 216	SM	12F	276	216				
	2 3									
	3 1									
XR97	1 2	3" 216	SM	12F	276	216				
	2 3									
	3 1									
XR98	1 2	3" 216	SM	12F	276	216				
	2 3									
	3 1									
XR99	1 2	3" 216	SM	12F	276	216				
	2 3									
	3 1									
XR100	1 2	3" 216	SM	12F	32"	216			Light leak	A
	2 3									
	3 1									

RT Techniques:
 Exposure S.W.V. Viewing Technique
 S.W.E S.W.V. 1, 2, 2A, 6, 7
 D.W.E S.W.V. 3, 3A
 D.W.E D.W.V. 4, 5, 8

S.O.D. = Source-to-object distance
 O.F.D. = Distance from source side of object to film

AB - Arc Burns
 BT - Burn Through
 CK - Crack
 EP - Excessive Penetration
 P - Porosity
 EI - Elongated Indication

EUC - External Undercut
 IUC - Internal Undercut
 HB - Hollow Bead
 IP - Incomplete Penetration
 S - Slag

IC - Internal Concavity
 LF - Lack of Fusion
 LC - Low Cover
 MA - Misalignment
 TI - Tungsten Inclusion

Unit#: 60 Miles: _____
 In: _____ Out: _____ Hrs: _____
 In: _____ Out: _____ Hrs: _____
 Personnel: Chris
Denise

Film Quantity:
 3 1/2 x 8 1/2 /10
 3 1/2 x 17
 4 1/2 x 8 1/2 /10
 4 1/2 x 17
 7 x 17
 14 x 17
 8 x 10

Interpretation by:
Chris SNT-TC-1A
 (Print)
Denise ASNT
 (Signature) (Level)
 Client Representative: _____ CERT # 104
 (Print)
 I am in full agreement with report contents
 (Sign)



RADIOGRAPHIC INSPECTION REPORT

Gamma Type:	IR 192	Film Brand:	FUJI, AGFA	Client:	United Contracting Services	Date:	3/15/2017
Curies:	94	Film Type:	80,D3	Job#:	S-4248	IRISNDT#:	1143
EFSS:	0.146"	#Film/Cassette:	1	Location:	Tulsa, OK	PKG#:	
Code:	B31.3 NFS			Item Inspected:	spool piping		
Material:	Carbon Steel						

Film ID	Interval	Size, Thickness	Welder ID	IQI	S.O.D. Inches	O.F.D. Inches	Density	Tech.	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A)cept (R)ject
XR120	T-2	6" .280"	SG	15.F	6.625"	.280"	2-4	RT3		A
	2-3									A
	3-T									A
XR111	T-2	6" .280"	SG	15.F	6.625"	.280"	2-4	RT3		A
	2-3									A
	3-T									A
XR153	T-2	6" .280"	SG	15.F	6.625"	.280"	2-4	RT3		A
	2-3									A
	3-T									A
XR152	T-2	6" .280"	SG	15.F	6.625"	.280"	2-4	RT3	CONCAVITY-OK	A
	2-3								CONCAVITY-OK	A
	3-T								CONCAVITY-OK	A
XR154	T-2	6" .280"	SG	15.F	6.625"	.280"	2-4	RT3		A
	2-3									A
	3-T									A
XR155	T-2	8" .500"	SG	B.F	8.625"	.500"	2-4	RT3		A
	2-3									A
	3-T								POR	R
XR156	T-2	8" .500"	EM	B.F	8.625"	.500"	2-4	RT3		A
	2-3									A
	3-T									A

RT Technique: Exposure Viewing Technique S.W.E. S.W.V. 1,2,2A,6,7 D.W.E. S.W.V. 3,3A D.W.E. D.W.V. 4, 5, 8	S.O.D. = Source-to-object distance O.F.D. = Distance from source side of object to film	AB - Arc Burns BT - Burn Through CK - Crack EP - Excessive Penetration P - Porosity EL - Elongated Indication	EUIC - External Undercut IUC - Internal Undercut HB - Hollow Bead IP - Incomplete Penetration S - Slag	IC - Internal Concavity LF - Lack of Fusion LC - Low Cover MA - Misalignment TI - Tungsten Inclusion
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Unit# <u>395</u> Miles _____ In: _____ Out: _____ Hrs _____ In: _____ Out: _____ Hrs _____	Film Quantity: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>3 1/2 x 8 1/2 /10</td> <td>15</td> </tr> <tr> <td>3 1/2 x 17</td> <td>6</td> </tr> <tr> <td>4 1/2 x 8 1/2 /10</td> <td></td> </tr> <tr> <td>4 1/2 x 17</td> <td></td> </tr> <tr> <td>7 x 17</td> <td></td> </tr> <tr> <td>14 x 17</td> <td></td> </tr> <tr> <td>8 x 10</td> <td></td> </tr> </table>	3 1/2 x 8 1/2 /10	15	3 1/2 x 17	6	4 1/2 x 8 1/2 /10		4 1/2 x 17		7 x 17		14 x 17		8 x 10		Interpretation by: <div style="text-align: center;"> <u>Daniel Culver</u> SNT-TC-1A II (Signature) CGSB ASNT Cert # <u>341</u> </div> Personnel: Daniel Culver Casey McDaniel Client Representative I am in full agreement (Print) _____ with report contents (Sign) _____
3 1/2 x 8 1/2 /10	15															
3 1/2 x 17	6															
4 1/2 x 8 1/2 /10																
4 1/2 x 17																
7 x 17																
14 x 17																
8 x 10																

Customer: UCS	Location: _____	Date: 5/12/2017
Job: CRYO	P.O. #: _____	W.O. #: _____
AFE: _____	Material: CS/SS	Code: ASME B31.3 N
		FJT#: 1705121341
		Code: ASME B31.3 N


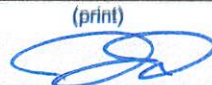

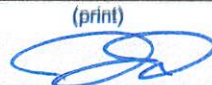

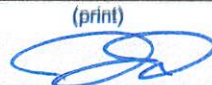
TESTING VARIABLES

IR192 <input checked="" type="checkbox"/>	CO60 <input type="checkbox"/>	SE75 <input type="checkbox"/>	X-Ray <input type="checkbox"/>	Single Film <input checked="" type="checkbox"/>	Composite Film <input type="checkbox"/>	Digital Image <input type="checkbox"/>
Exposure Technique		DWE/SWV <input checked="" type="checkbox"/>	DWE/DWV <input type="checkbox"/>	SWE/SWV <input type="checkbox"/>	Type: FUJI 29 / FUJI 50 / FUJI 80	Class: I / I / I
Film Usage	70mm: 4	3 1/2 x 8 1/2: 4	3 1/2 x 10: 12	3 1/2 x 17: 10	4 1/2 x 8 1/2: _____	4 1/2 x 10: _____
	8 x 10: _____	14 x 17: _____	7 x 17: _____	4 1/2 x 17: _____	2 1/2 x 5 1/2: _____	

Film I.D.	Film Interval	I.Q.I.	O.D. (Inches)	Material Thickness	Welder Stamp	Density	Accept Reject	Comments and Remarks	
1	045 XR-64R	T-2	1BF	4.500	0.237	SG	2.0-3.8	R	
2		2-3	1BF	4.500	0.237	SG	2.0-3.8	A	
3		3-T	1BF	4.500	0.237	SG	2.0-3.8	A	
4	075 XR-84	T-2	1BF	10.75	0.365	SG	2.0-3.8	A	
5		2-3	1BF	10.75	0.365	SG	2.0-3.8	A	
6		3-T	1BF	10.75	0.365	SG	2.0-3.8	R	
7	075 XR-86	T-2	1BF	10.75	0.365	SG	2.0-3.8	A	
8		2-3	1BF	10.75	0.365	SG	2.0-3.8	A	
9		3-T	1BF	10.75	0.365	SG	2.0-3.8	R	
10	008 XR-93								
11									
12		2-3	1AF	2.375	0.218	SM	2.0-3.8	A	
13	031 XR-97	T-2	1AF	2.375	0.218	EM	2.0-3.8	R	
14		2-3	1AF	2.375	0.218	EM	2.0-3.8	R	
15		3-T	1AF	2.375	0.218	EM	2.0-3.8	R	
16	053 XR-121	T-2	1BF	6.625	0.280	SG	2.0-3.8	A	
17		2-3	1BF	6.625	0.280	SG	2.0-3.8	A	
18		3-T	1BF	6.625	0.280	SG	2.0-3.8	A	
19	044 XR-124	T-2	1BF	6.625	0.280	SM	2.0-3.8	A	
20		2-3	1BF	6.625	0.280	SM	2.0-3.8	A	
21		3-T	1BF	6.625	0.280	SM	2.0-3.8	A	
22	044 XR-125	T-2	1BF	6.625	0.280	SM	2.0-3.8	A	
23		2-3	1BF	6.625	0.280	SM	2.0-3.8	A	
24		3-T	1BF	6.625	0.280	SM	2.0-3.8	A	
25	037 XR-145	T-2	1BF	8.625	0.322	SM	2.0-3.8	A	
26		2-3	1BF	8.625	0.322	SM	2.0-3.8	A	
27		3-T	1BF	8.625	0.322	SM	2.0-3.8	A	
28	008 XR-256	T-2	1BF	6.625	0.280	JP	2.0-3.8	A	
29		2-3	1BF	6.625	0.280	JP	2.0-3.8	A	
30		3-T	1BF	6.625	0.280	JP	2.0-3.8	A	

Terms and Abbreviations:

AB - Arc Burns	EUC - External Undercut	HB - Hollow Bead	LC - Low Cover	P - Porosity
BT - Burn Through	IUC - Internal Undercut	IP - Incomplete Penetration	MA -	S - Slag
CK - Crack	EP - Excessive Penetration	IC - Internal Concavity	LF - Lack of	RS - Round Seam
LS - Long Seam	IQI - Image Quality Indicator (Penetrameter)			

Vehicle #: _____ Miles Driven: _____ Hours: _____ Personnel: Graffenstein, Lance _____ _____ _____	<table style="width:100%;"> <tr> <td style="width:50%;"> SNT-TC-1A: _____ CERT. #: 0 Accepted: 5/12/2017 2:34:29 PM I am in full agreement with report contents: Client Representative: _____ </td> <td style="width:50%; text-align: right;"> Interpretation by Graffenstein, Lance _____ (print)  _____ (signature) _____ (print)  _____ (signature) </td> </tr> </table>	SNT-TC-1A: _____ CERT. #: 0 Accepted: 5/12/2017 2:34:29 PM I am in full agreement with report contents: Client Representative: _____	Interpretation by Graffenstein, Lance _____ (print)  _____ (signature) _____ (print)  _____ (signature)
SNT-TC-1A: _____ CERT. #: 0 Accepted: 5/12/2017 2:34:29 PM I am in full agreement with report contents: Client Representative: _____	Interpretation by Graffenstein, Lance _____ (print)  _____ (signature) _____ (print)  _____ (signature)		

Customer: UCS	Location:	Date: 5/12/2017
Job: CRYO	P.O. #:	FJT#: 1705121341
AFE:	Material: CS/SS	Code: ASME B31.3 N

TESTING VARIABLES							
IR192 <input checked="" type="checkbox"/>	CO60 <input type="checkbox"/>	SE75 <input type="checkbox"/>	X-Ray <input type="checkbox"/>	Single Film <input checked="" type="checkbox"/>	Composite Film <input type="checkbox"/>	Digital Image <input type="checkbox"/>	
Exposure Technique		DWE/SWV <input checked="" type="checkbox"/>	DWE/DWV <input type="checkbox"/>	SWE/SWV <input type="checkbox"/>	Type: _____ / _____ / _____	Class: _____ / _____ / _____	
Film Usage	70mm: 18	3 1/2 x 8 1/2: 3	3 1/2 x 10: 9	3 1/2 x 17: _____	4 1/2 x 8 1/2: _____	4 1/2 x 10: _____	
	8 x 10: _____		14 x 17: _____	7 x 17: _____	4 1/2 x 17: _____	2 1/2 x 5 1/2: _____	

Film I.D.	Film Interval	I.Q.I.	O.D. (Inches)	Material Thickness	Welder Stamp	Density	Accept Reject	Comments and Remarks
074 XR-261	T-2	1BF	6.625	0.280	JP	2.0-3.8	A	
	2-3	1BF	6.625	0.280	JP	2.0-3.8	A	
	3-T	1BF	6.625	0.280	JP	2.0-3.8	A	
074 XR-262	T-2	1BF	6.625	0.280	JP	2.0-3.8	A	
	2-3	1BF	6.625	0.280	JP	2.0-3.8	A	
	3-T	1BF	6.625	0.280	JP	2.0-3.8	A	
074 XR-263	T-2	1BF	6.625	0.280	JP	2.0-3.8	A	
	2-3	1BF	6.625	0.280	JP	2.0-3.8	A	
	3-T	1BF	6.625	0.280	JP	2.0-3.8	A	
038 XR-264	T-2	1AF	2.375	0.218	V8	2.0-3.8	A	
	2-3	1AF	2.375	0.218	V8	2.0-3.8	A	
	3-T	1AF	2.375	0.218	V8	2.0-3.8	B	
055 XR-265	T-2	1AF	2.375	0.218	EM	2.0-3.8	A	
	2-3	1AF	2.375	0.218	EM	2.0-3.8	A	
	3-T	1AF	2.375	0.218	EM	2.0-3.8	A	
055 XR-266	T-2	1AF	2.375	0.218	EM	2.0-3.8	A	
	2-3	1AF	2.375	0.218	EM	2.0-3.8	A	
	3-T	1AF	2.375	0.218	EM	2.0-3.8	A	
050 XR-267	T-2	1BF	3.500	0.216	EM	2.0-3.8	A	
	2-3	1BF	3.500	0.216	EM	2.0-3.8	A	
	3-T	1BF	3.500	0.216	EM	2.0-3.8	A	
069 XR-268	T-2	1AF	2.375	0.218	EM	2.0-3.8	A	
	2-3	1AF	2.375	0.218	EM	2.0-3.8	A	
	3-T	1AF	2.375	0.218	EM	2.0-3.8	A	
069 XR-269	T-2	1AF	2.375	0.218	EM	2.0-3.8	B	
	2-3	1AF	2.375	0.218	EM	2.0-3.8	A	
	3-T	1AF	2.375	0.218	EM	2.0-3.8	A	
051 XR-270	T-2	1AF	2.375	0.218	SM	2.0-3.8	A	
	2-3	1AF	2.375	0.218	SM	2.0-3.8	B	
	3-T	1AF	2.375	0.218	SM	2.0-3.8	A	

Terms and Abbreviations:			
AB - Arc Burns	EUC - External Undercut	HB - Hollow Bead	LC - Low Cover
BT - Burn Through	IUC - Internal Undercut	IP - Incomplete Penetration	MA -
CK - Crack	EP - Excessive Penetration	IC - Internal Concavity	LF - Lack of
LS - Long Seam	IQI - Image Quality Indicator (Penetrameter)		P - Porosity
			S - Slag
			RS - Round Seam

Vehicle #: _____ Miles Driven: _____ Hours: _____ Personnel: Graffenstein, Lance _____ _____ _____	<p style="text-align: right;">Interpretation by</p> SNT-TC-1A: _____ Graffenstein, Lance (print) CERT. #: 0 _____ (signature) Accepted: 5/12/2017 2:34:21 PM I am in full agreement with report contents: (print) Client Representative: _____ (signature)
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Customer: UCS	Location:	Date: 5/12/2017
Job: CRYO	P.O. #:	FJT#: 1705121341
AFE:	Material: CS/SS	Code: ASME B31.3 N

TESTING VARIABLES							
IR192 <input checked="" type="checkbox"/>	CO60 <input type="checkbox"/>	SE75 <input type="checkbox"/>	X-Ray <input type="checkbox"/>	Single Film <input checked="" type="checkbox"/>	Composite Film <input type="checkbox"/>	Digital Image <input type="checkbox"/>	
Exposure Technique		DWE/SWV <input checked="" type="checkbox"/>	DWE/DWV <input type="checkbox"/>	SWE/SWV <input type="checkbox"/>	Type: _____ / _____ / _____	Class: _____ / _____ / _____	
Film Usage	70mm: 3	3 1/2 x 8 1/2: _____	3 1/2 x 10: 21	3 1/2 x 17: 6	4 1/2 x 8 1/2: _____	4 1/2 x 10: _____	
		8 x 10: _____	14 x 17: _____	7 x 17: _____	4 1/2 x 17: _____	2 1/2 x 5 1/2: _____	

Film I.D.	Film Interval	I.Q.I.	O.D. (Inches)	Material Thickness	Welder Stamp	Density	Accept Reject	Comments and Remarks
1 051 XR-271	T-2	1AF	2.375	0.218	SM	2.0-3.8	A	
2	2-3	1AF	2.375	0.218	SM	2.0-3.8	A	
3	3-T	1AF	2.375	0.218	SM	2.0-3.8	A	
4 074 XR-272	T-2	1BF	6.625	0.280	JG	2.0-3.8	A	
5	2-3	1BF	6.625	0.280	JG	2.0-3.8	A	
6	3-T	1BF	6.625	0.280	JG	2.0-3.8	A	
7 074 XR-273	T-2	1BF	6.625	0.280	JG	2.0-3.8	A	
8	2-3	1BF	6.625	0.280	JG	2.0-3.8	A	
9	3-T	1BF	6.625	0.280	JG	2.0-3.8	A	
10 003 XR-274	T-2	1BF	8.625	0.322	JG	2.0-3.8	A	
11	2-3	1BF	8.625	0.322	JG	2.0-3.8	A	
12	3-T	1BF	8.625	0.322	JG	2.0-3.8	A	
13 008 XR-275	T-2	1BF	6.625	0.280	JG	2.0-3.8	A	
14	2-3	1BF	6.625	0.280	JG	2.0-3.8	A	
15	3-T	1BF	6.625	0.280	JG	2.0-3.8	A	
16 015 XR-276	T-2	1BF	10.75	0.365	JG	2.0-3.8	A	
17	2-3	1BF	10.75	0.365	JG	2.0-3.8	A	
18	3-T	1BF	10.75	0.365	JG	2.0-3.8	A	
19 008 XR-277	T-2	1BF	6.625	0.280	JG	2.0-3.8	A	
20	2-3	1BF	6.625	0.280	JG	2.0-3.8	A	
21	3-T	1BF	6.625	0.280	JG	2.0-3.8	A	
22 073 XR-278	T-2	1BF	6.625	0.280	AS	2.0-3.8	A	
23	2-3	1BF	6.625	0.280	AS	2.0-3.8	A	
24	3-T	1BF	6.625	0.280	AS	2.0-3.8	A	
25 039 XR-279	T-2	1BF	6.625	0.280	AS	2.0-3.8	A	
26	2-3	1BF	6.625	0.280	AS	2.0-3.8	A	
27	3-T	1BF	6.625	0.280	AS	2.0-3.8	A	
28 039 XR-280	T-2	1BF	6.625	0.280	AS	2.0-3.8	A	
29	2-3	1BF	6.625	0.280	AS	2.0-3.8	A	
30	3-T	1BF	6.625	0.280	AS	2.0-3.8	A	

Terms and Abbreviations:			
AB - Arc Burns	EUC - External Undercut	HB - Hollow Bead	LC - Low Cover
BT - Burn Through	IUC - Internal Undercut	IP - Incomplete Penetration	MA -
CK - Crack	EP - Excessive Penetration	IC - Internal Concavity	LF - Lack of
LS - Long Seam	IQI - Image Quality Indicator (Penetrameter)		P - Porosity
			S - Slag
			RS - Round Seam

Vehicle #: _____ Miles Driven: _____ Hours: _____ Personnel: Graffenstein, Lance _____ _____ _____	<p style="text-align: right;">Interpretation by</p> SNT-TC-1A: _____ Graffenstein, Lance (print) CERT. #: 0 _____ (signature) Accepted: 5/12/2017 2:34:12 PM I am in full agreement with report contents: (print) Client Representative: _____ (signature)
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Radiographic Inspection Report

Customer: UCS	Location:	Date: 5/12/2017
Job: CRYO	P.O. #:	W.O. #:
AFE:	Material: CS/SS	Code: ASME B31.3 N
		FJT#: 1705121341
		Code: ASME B31.3 N

TESTING VARIABLES

IR192 <input checked="" type="checkbox"/>	CO60 <input type="checkbox"/>	SE75 <input type="checkbox"/>	X-Ray <input type="checkbox"/>	Single Film <input checked="" type="checkbox"/>	Composite Film <input type="checkbox"/>	Digital Image <input type="checkbox"/>
Exposure Technique	DWE/SWV <input checked="" type="checkbox"/>	DWE/DWV <input type="checkbox"/>	SWE/SWV <input type="checkbox"/>	Type: _____ / _____ / _____	Class: _____ / _____ / _____	
Film Usage	70mm: 3	3 1/2 x 8 1/2: _____	3 1/2 x 10: 6	3 1/2 x 17: _____	4 1/2 x 8 1/2: _____	4 1/2 x 10: _____
	8 x 10: _____	14 x 17: _____	7 x 17: _____	4 1/2 x 17: _____	2 1/4 x 5 1/2: _____	

Film I.D.	Film Interval	I.Q.I.	O.D. (Inches)	Material Thickness	Welder Stamp	Density	Accept Reject	Comments and Remarks
1 050 XR-281	T-2	1BF	3.500	0.216	AS	2.0-3.8	A	
2	2-3	1BF	3.500	0.216	AS	2.0-3.8	R	
3	3-T	1BF	3.500	0.216	AS	2.0-3.8	R	
4 015 XR-282	T-2	1BF	6.625	0.280	ML	2.0-3.8	A	
5	2-3	1BF	6.625	0.280	ML	2.0-3.8	A	
6	3-T	1BF	6.625	0.280	ML	2.0-3.8	A	
7 074 XR-283	T-2	1BF	6.625	0.280	BD	2.0-3.8	A	
8	2-3	1BF	6.625	0.280	BD	2.0-3.8	A	
9	3-T	1BF	6.625	0.280	BD	2.0-3.8	A	
10								
11								
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30								

Terms and Abbreviations:

AB - Arc Burns	EUC - External Undercut	HB - Hollow Bead	LC - Low Cover	P - Porosity
BT - Burn Through	IUC - Internal Undercut	IP - Incomplete Penetration	MA -	S - Slag
CK - Crack	EP - Excessive Penetration	IC - Internal Concavity	LF - Lack of	RS - Round Seam
LS - Long Seam	IQI - Image Quality Indicator (Penetrameter)			

Vehicle #:	
Miles Driven:	
Hours:	
Personnel:	Graffenstein, Lance

Interpretation by	Graffenstein, Lance
SNT-TC-1A:	
CERT. #: 0	
Accepted: 5/12/2017 2:34:01 PM	
I am in full agreement with report contents:	
Client Representative:	

Customer: UCS	Location: _____	Date: 5/16/2017
Job: CRYO	P.O. #: _____	W.O. #: _____
AFE: _____	Material: CS	Code: ASME B31.3 N
		FJT#: 1705161738
		Code: ASME B31.3 N

TESTING VARIABLES

IR192 <input checked="" type="checkbox"/>	CO60 <input type="checkbox"/>	SE75 <input type="checkbox"/>	X-Ray <input type="checkbox"/>	Single Film <input checked="" type="checkbox"/>	Composite Film <input type="checkbox"/>	Digital Image <input type="checkbox"/>
Exposure Technique		DWE/SWV <input checked="" type="checkbox"/>	DWE/DWV <input type="checkbox"/>	SWE/SWV <input type="checkbox"/>	Type: _____ / _____ / _____	Class: _____ / _____ / _____
Film Usage	70mm: _____	3 1/2 x 8 1/2: 15	3 1/2 x 10: 12	3 1/2 x 17: 3	4 1/2 x 8 1/2: _____	4 1/2 x 10: _____
		8 x 10: _____	14 x 17: _____	7 x 17: _____	4 1/2 x 17: _____	2 1/4 x 5 1/2: _____

Film I.D.	Film Interval	I.Q.I.	O.D. (Inches)	Material Thickness	Welder Stamp	Density	Accept Reject	Comments and Remarks
1 058 XR-363 T1	T-2	1BF	6.625	0.280	SG	2.0-3.8	A	
2	2-3	1BF	6.625	0.280	SG	2.0-3.8	A	
3	3-T	1BF	6.625	0.280	SG	2.0-3.8	A	
4 075 XR-364 T2	T-2	1BF	6.625	0.322	SG	2.0-3.8	A	
5	2-3	1BF	6.625	0.322	SG	2.0-3.8	A	
6	3-T	1BF	6.625	0.322	SG	2.0-3.8	A	
7 062 XR-365 T1	T-2	1BF	3.500	0.216	EM	2.0-3.8	R	
8	2-3	1BF	3.500	0.216	EM	2.0-3.8	R	
9	3-T	1BF	3.500	0.216	EM	2.0-3.8	A	
10 062 XR-366 T2	T-2	1BF	3.500	0.216	EM	2.0-3.8	A	
11	2-3	1BF	3.500	0.216	EM	2.0-3.8	A	
12	3-T	1BF	3.500	0.216	EM	2.0-3.8	A	
13 062 XR-367 T1	T-2	1BF	3.500	0.216	EM	2.0-3.8	A	
14	2-3	1BF	3.500	0.216	EM	2.0-3.8	A	
15	3-T	1BF	3.500	0.216	EM	2.0-3.8	A	
16 008 XR-369 T1	T-2	1BF	6.625	0.280	AS	2.0-3.8	A	
17	2-3	1BF	6.625	0.280	AS	2.0-3.8	A	
18	3-T	1BF	6.625	0.280	AS	2.0-3.8	A	
19 073 XR-370 T2	T-2	1BF	6.625	0.280	AS	2.0-3.8	A	
20	2-3	1BF	6.625	0.280	AS	2.0-3.8	A	
21	3-T	1BF	6.625	0.280	AS	2.0-3.8	A	
22 027 XR-371 T1	T-2	1BF	4.500	0.237	SM	2.0-3.8	A	
23	2-3	1BF	4.500	0.237	SM	2.0-3.8	A	
24	3-T	1BF	4.500	0.237	SM	2.0-3.8	R	
25 027 XR-372 T2	T-2	1BF	4.500	0.237	SM	2.0-3.8	A	
26	2-3	1BF	4.500	0.237	SM	2.0-3.8	A	
27	3-T	1BF	4.500	0.237	SM	2.0-3.8	A	
28 044 XR-373 T1	T-2	1BF	6.625	0.280	SM	2.0-3.8	A	
29	2-3	1BF	6.625	0.280	SM	2.0-3.8	A	
30	3-T	1BF	6.625	0.280	SM	2.0-3.8	A	

Terms and Abbreviations:

AB - Arc Burns	EUC - External Undercut	HB - Hollow Bead	LC - Low Cover	P - Porosity
BT - Burn Through	IUC - Internal Undercut	IP - Incomplete Penetration	MA -	S - Slag
CK - Crack	EP - Excessive Penetration	IC - Internal Concavity	LF - Lack of	RS - Round Seam
LS - Long Seam	IQI - Image Quality Indicator (Penetrameter)			

Vehicle #: _____ Miles Driven: _____ Hours: 3 Personnel: Graffenstein, Lance _____ McVey, John _____ _____	Interpretation by SNT-TC-1A: _____ Graffenstein, Lance (print) CERT. #: 0 _____ (signature) Accepted: 5/22/2017 7:11:12 AM I am in full agreement with report contents: _____ (print) Client Representative: _____ (signature)
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Customer: UCS Location: Date: *5/11/12*
 Job: CRYO P.O. #: W.O. #: FJT#: **1705161738**
 AFE: Material: CS Code: ASME B31.3 N Code: ASME B31.3 N

TESTING VARIABLES

IR192	CO60	SE75	X-Ray	Single Film X	Composite Film	Digital Image
Exposure Technique		DWE/SWV X	DWE/DWV	SWE/SWV	Type:	Class:
Film	70mm:	3 1/2 x 8 1/2:	3 1/2 x 10:	3 1/2 x 17:	4 1/2 x 8 1/2:	4 1/2 x 10:
Usage		8 x 10:	14 x 17:	7 x 17:	4 1/2 x 17:	2 1/2 x 5 1/2:

Film I.D.	Film Interval	I.Q.I.	O.D. (Inches)	Material Thickness	Welder Stamp	Density	Accept Reject	Comments and Remarks
1 003 XR-374 T2	T-2	1BF	4.500	0.237	SM	2.0-3.8	A	
2	2-3	1BF	4.500	0.237	SM	2.0-3.8	A	
3	3-T	1BF	4.500	0.237	SM	2.0-3.8	A	
4								
5								
6								
7								
8								
9								
10								
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15								
16								
17								
18								
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Terms and Abbreviations:

AB - Arc Burns	EUC - External Undercut	HB - Hollow Bead	LC - Low Cover	P - Porosity
BT - Burn Through	IUC - Internal Undercut	IP - Incomplete Penetration	MA -	S - Slag
CK - Crack	EP - Excessive Penetration	IC - Internal Concavity	LF - Lack of	RS - Round Seam
LS - Long Seam	IQI - Image Quality Indicator (Penetrameter)			

Vehicle #: _____ Interpretation by _____
 Miles Driven: _____ Hours: _____ SNT-TC-1A: _____ Graffenstein, Lance
 Personnel: Graffenstein, Lance CERT. #: 0 (print)
 Bailey, Shane Accepted: 5/22/2017 7:13:46 AM (signature)
 Easton, Jake I am in full agreement with report contents: (print)
 Client Representative: _____ (signature)

Customer: UCS	Location: _____	Date: 6/1/2017
Job: CRYO	P.O. #: _____	W.O. #: _____
AFE: _____	Material: CS/SS	Code: ASME B31.3 N
		FJT#: 1706011011
		Code: ASME B31.3 N


TESTING VARIABLES

IR192 <input type="checkbox"/>	CO60 <input type="checkbox"/>	SE75 <input type="checkbox"/>	X-Ray <input type="checkbox"/>	Single Film <input checked="" type="checkbox"/>	Composite Film <input type="checkbox"/>	Digital Image <input type="checkbox"/>
Exposure Technique		DWE/SWV <input checked="" type="checkbox"/>	DWE/DWV <input type="checkbox"/>	SWE/SWV <input type="checkbox"/>	Type: _____ / _____ / _____	Class: _____ / _____ / _____
Film Usage	70mm: _____	3 1/2 x 8 1/2: _____	3 1/2 x 10: _____	3 1/2 x 17: _____	4 1/2 x 8 1/2: _____	4 1/2 x 10: _____
		8 x 10: _____	14 x 17: _____	7 x 17: _____	4 1/2 x 17: _____	2 1/2 x 5 1/2: _____

Film I.D.	Film Interval	I.Q.I.	O.D. (Inches)	Material Thickness	Welder Stamp	Density	Accept Reject	Comments and Remarks
1	045 XR-64R	T-2	1BF	4.500	0.237	SG	2.0-3.8	A
2		2-3	1BF	4.500	0.237	SG	2.0-3.8	A
3		3-T	1BF	4.500	0.237	SG	2.0-3.8	A
4	075 XR-84	3-T	1BF	10.75	0.365	SG	2.0-3.8	A
5	075 XR-86	3-T	1BF	10.75	0.365	SG	2.0-3.8	A
6	031 XR-97	T-2	1AF	2.375	0.218	EM	2.0-3.8	A
7		2-3	1AF	2.375	0.218	EM	2.0-3.8	A
8		3-T	1AF	2.375	0.218	EM	2.0-3.8	A
9	035 XR-264	3-T	1AF	2.375	0.218	V8	2.0-3.8	A
10	069 XR-269	T-2	1AF	2.375	0.218	EM	2.0-3.8	A
11	051 XR-270	2-3	1AF	2.375	0.218	SM	2.0-3.8	A
12	051 XR-271	T-2	1AF	2.375	0.218	SM	2.0-3.8	A
13		3-T	1AF	2.375	0.218	SM	2.0-3.8	A
14	060 XR-281	2-3	1BF	3.500	0.218	AS	2.0-3.8	A
15		3-T	1BF	3.500	0.218	AS	2.0-3.8	A
16	062 XR-365 T1	T-2	1BF	3.500	0.218	AS	2.0-3.8	A
17		2-3	1BF	3.500	0.218	AS	2.0-3.8	A
18	027 XR-371 T1	3-T	1BF	4.500	0.237	SM	2.0-3.8	A
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Terms and Abbreviations:

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CK - Crack	EP - Excessive Penetration	IC - Internal Concavity	LF - Lack of	RS - Round Seam
LS - Long Seam	IQI - Image Quality Indicator (Penetrameter)			

Vehicle #: _____ Miles Driven: _____ Hours: _____ Personnel: _____ _____ _____ _____	<p style="text-align: right;">Interpretation by</p> <p>SNT-TC-1A: _____ <u>Lance Graffenstein</u></p> <p style="text-align: right;">(print)</p> <p>CERT. #: _____ </p> <p style="text-align: right;">(signature)</p> <p>Accepted: 6/1/2017 11:01:06 AM</p> <p>I am in full agreement with report contents: <u>PMP</u></p> <p style="text-align: right;">(print)</p> <p>Client Representative: </p> <p style="text-align: right;">(signature)</p>
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Customer: UCS	Location: _____	Date: 6/6/2017
Job: _____	P.O. #: _____	W.O. #: _____
AFE: _____	Material: _____	Code: _____
		FJT#: 1706061120
		Code: _____

TESTING VARIABLES

IR192 <input type="checkbox"/>	CO60 <input type="checkbox"/>	SE75 <input type="checkbox"/>	X-Ray <input type="checkbox"/>	Single Film <input checked="" type="checkbox"/>	Composite Film <input type="checkbox"/>	Digital Image <input type="checkbox"/>
Exposure Technique		DWE/SWV <input checked="" type="checkbox"/>	DWE/DWV <input type="checkbox"/>	SWE/SWV <input type="checkbox"/>	Type: FUJI 80 / _____ / _____	Class: I / _____ / _____
Film Usage	70mm: _____	3 1/2 x 8 1/2: _____	3 1/2 x 10: _____	3 1/2 x 17: _____	4 1/2 x 8 1/2: _____	4 1/2 x 10: _____
		8 x 10: _____	14 x 17: _____	7 x 17: _____	4 1/2 x 17: _____	2 1/4 x 5 1/2: _____

Film I.D.	Film Interval	I.Q.I.	O.D. (Inches)	Material Thickness	Welder Stamp	Density	Accept Reject	Comments and Remarks
1 062 XR-368	T-2	1BF	3.500	0.216	EM	2.0-3.8	A	
2	2-3	1BF	3.500	0.216	EM	2.0-3.8	A	
3	3-T	1BF	3.500	0.216	EM	2.0-3.8	A	
4 016 XR-41	3-T	1BF	10.75	0.365	SG	2.0-3.8	A	
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Terms and Abbreviations:

- | | | | | |
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| LS - Long Seam | IQI - Image Quality Indicator (Penetrameter) | | | |

Vehicle #: _____ Miles Driven: _____ Hours: _____ Personnel: _____ _____ _____ _____	<p style="text-align: center;">Interpretation by</p> <p style="text-align: center;">SNT-TC-1A: _____ Lance Graffenstein</p> <p style="text-align: center;">CERT. #: _____ (print)</p> <p style="text-align: center;">Accepted: 6/6/2017 11:24:11 AM I am in full agreement with report contents:</p> <p style="text-align: center;">Client Representative: _____ (signature)</p>
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Customer: UCS	Location: _____	Date: 6/6/2017
Job: 0	P.O. #: _____	W.O. #: _____
AFE: _____	Material: _____	Code: _____
		FJT#: 1706061120
		Code: _____


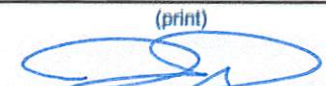
TESTING VARIABLES

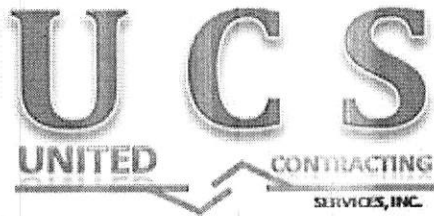
IR192 <input type="checkbox"/>	CO60 <input type="checkbox"/>	SE75 <input type="checkbox"/>	X-Ray <input type="checkbox"/>	Single Film <input checked="" type="checkbox"/>	Composite Film <input type="checkbox"/>	Digital Image <input type="checkbox"/>
Exposure Technique		DWE/SWV <input checked="" type="checkbox"/>	DWE/DWV <input type="checkbox"/>	SWE/SWV <input type="checkbox"/>	Type: _____ / _____ / _____	Class: _____ / _____ / _____
Film Usage	70mm: _____	3 1/2 x 8 1/2: _____	3 1/2 x 10: _____	3 1/2 x 17: _____	4 1/2 x 8 1/2: _____	4 1/2 x 10: _____
		8 x 10: _____	14 x 17: _____	7 x 17: _____	4 1/2 x 17: _____	2 1/4 x 5 1/2: _____

Film I.D.	Film Interval	I.Q.I.	O.D. (Inches)	Material Thickness	Welder Stamp	Density	Accept Reject	Comments and Remarks
1	038 XR-379	T-2	1AF	2.375	0.218	V8	2.0-3.8	A
2		2-3	1AF	2.375	0.218	V8	2.0-3.8	A
3		3-T	1AF	2.375	0.218	V8	2.0-3.8	A
4	071 XR-381	T-2	1BF	8.625	0.322	EM	2.0-3.8	A
5		2-3	1BF	8.625	0.322	EM	2.0-3.8	A
6		3-T	1BF	8.625	0.322	EM	2.0-3.8	A
7	071 XR-382	T-2	1BF	8.625	0.322	EM	2.0-3.8	A
8		2-3	1BF	8.625	0.322	EM	2.0-3.8	A
9		3-T	1BF	8.625	0.322	EM	2.0-3.8	A
10	046 XR-383	T-2	1BF	6.625	0.280	SG	2.0-3.8	A
11		2-3	1BF	6.625	0.280	SG	2.0-3.8	A
12		3-T	1BF	6.625	0.280	SG	2.0-3.8	A
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Vehicle #: _____ Miles Driven: _____ Hours: _____ Personnel: _____ _____ _____ _____	<div style="text-align: right;">Interpretation by</div> SNT-TC-1A: _____ <u>Lance Graffenstein</u> <div style="text-align: right;">(print)</div> CERT. #: _____ <div style="text-align: right;"></div> <div style="text-align: right;">(signature)</div> Accepted: 6/6/2017 1:28:32 PM I am in full agreement with report contents: _____ <div style="text-align: right;">(print)</div> <div style="text-align: right;"></div> <div style="text-align: right;">(signature)</div>
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UCS JOB NO. S-4248

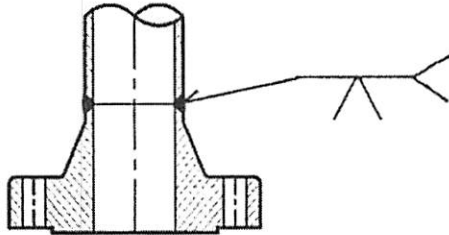
Section 5

Welding Procedures / Procedure
Qualification Records

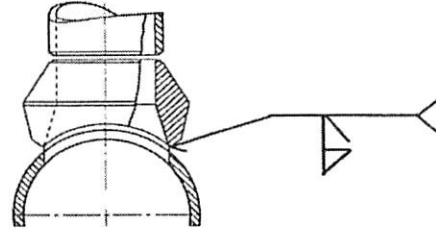
JOB: S-4248-03



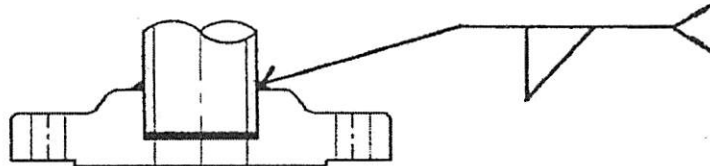
UCS JOB NO. S-4248-03
 CUSTOMER JOB NO. J-447
 PO NO. 4500757625
 DATE: 1/25/2017
 REVISION: 1



BUTT WELD, TYP.



O-LET WELD, TYP.

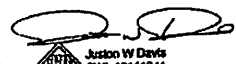


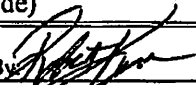
FILLET WELD, TYP.

JOINT TYPE: VARIOUS, PIPE				
WPS	PROCESS	MAX DEPOSIT-T	GROOVE-T, min/max	NOTES
5004A	GTAW	0.25"	0.187"-1.0"	P1-Gr.1or2 to P1-Gr.1or2, UNLIMITED PIPE DIA.
	SMAW	0.75"		
5011A	GMAW	0.25"	0.187"-1.50"	P1-Gr.1or2 to P1-Gr.1or2, UNLIMITED PIPE DIA.
	FCAW	1.25"		
5012A	GTAW	1.812"	0.187"-1.812"	P1-Gr.1or2 to P1-Gr.1or2, UNLIMITED PIPE DIA.
GT-1-1.2-50CVN	GTAW	0.625"	0.375"-0.75"	P1-Gr.1or2 to P1-Gr.1or2, BNH, UNLIMITED PIPE DIA.
GM-FC-1-1.2-50CVN	GMAW	0.1375	0.375"-0.75"	P1-Gr.1or2 to P1-Gr.1or2, BNH, UNLIMITED PIPE DIA.
	FCAW	0.50"		
5001A	GTAW	0.864"	0.187"-0.864"	P8-Gr.1 to P8Gr.1, 308L, 309L, 316L
5002A	GMAW	0.137"	0.187"-0.864"	P8 Gr.1 to P8-Gr.1, 308L OR 316L, MIN. PIPE DIA. =0.75"
	FCAW	0.614"		
5007A	GTAW	0.294"	0.062"-0.294"	P8-Gr.1 to P8G-Gr.1, 308L or 316L, UNLIMITED PIPE DIA.
ADDITIONAL NOTES:				
Rev. 1 added 5007A for P8 Gr. 1 weld groove thickness down to 0.062"				

UCS QUALITY REVIEW: _____ DATE: _____
 CUSTOMER REVIEW: _____ DATE: _____
 3RD PARTY/ END USER: _____ DATE: _____

QW-482 SUGGESTED FORMAT FOR WELDING PROCEDURE SPECIFICATION (WPS)
 (See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)


 Justin W Davis
 CWI 12111841
 QC1 EXP. 11/1/2018
 05MAR2015

Company Name UNITED CONTRACTING SERVICES By: Tim Morris Approved By:  10-22-12
 Welding Procedure Specification No. 5004-A Date 8-14-09 Supporting PQR No.(s) 5004-A
 Revision No. 3 Date 10-22-12
 Welding Process(es) GAS TUNGSTEN ARC WELDING (GTAW) & SHIELDED METAL ARC WELDING (SMAW) Type(s) GTAW/ SMAW -manual
 (Automatic, Manual, Machine, Semi-auto)

Joints (QW-402)	Details																																													
Joint Design <u>Single Vee or Bevel , Double Vee or Bevel</u> Backing (Yes) <u>Optional</u> (No) <u>GTAW-open root</u> Backing Material (type) <u>Weld metal for double sided weld</u> (Refer to both backing and retainers.) <input checked="" type="checkbox"/> Metal <input type="checkbox"/> Nonfusing Metal <input type="checkbox"/> Nonmetallic <input type="checkbox"/> Other Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified. (At the option of the Mfg., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process, procedures, etc.)	Joint Designs page 3 of WPS See shop drawings for optional joint designs used with this WPS. This WPS may be used in conjunction with other WPS' as indicated on shop drawings.																																													
* BASE METALS (QW-403) P-No. <u>1</u> Group No. <u>1 or 2</u> to P-No. <u>1</u> Group No. <u>1 or 2</u> OR Specification type and grade <u>Example: SA-106B</u> To Specification type and grade <u>Example: SA-106B</u> OR Chem. Analysis and Mech. Prop. _____ To Chem. Analysis and Mech. Prop. _____ Thickness Range: Base Metal: Groove <u>3/16" - 1"</u> Fillet <u>Unlimited</u> Pipe Dia. Range: Groove <u>All Diameters</u> Fillet <u>All Diameters</u> Other _____																																														
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">* FILLER METALS (QW-404)</th> <th style="width: 35%;">GTAW Root</th> <th style="width: 35%;">SMAW FILL</th> </tr> </thead> <tbody> <tr> <td>Spec. No. (SFA) _____</td> <td align="center">5.18</td> <td align="center">5.1</td> </tr> <tr> <td>AWS No. (Class) _____</td> <td align="center">ER70S-2 or ER70S-6</td> <td align="center">E7018 or E7018-1</td> </tr> <tr> <td>F-No. _____</td> <td align="center">6</td> <td align="center">4</td> </tr> <tr> <td>A-No. _____</td> <td align="center">1 (verify that ER70S-6 meets A1 chemistry)</td> <td align="center">1</td> </tr> <tr> <td>Size of Filler Metals _____</td> <td align="center">1/16", 3/32", 1/8"</td> <td align="center">3/32", 1/8", 5/32"</td> </tr> <tr> <td>Weld Metal _____</td> <td align="center">No autogenous welding allowed</td> <td></td> </tr> <tr> <td>Thickness Range:</td> <td></td> <td></td> </tr> <tr> <td> Groove _____</td> <td align="center">.250" (1/4") maximum deposit</td> <td align="center">.750" (3/4") max. deposit</td> </tr> <tr> <td> Fillet _____</td> <td align="center">Unlimited</td> <td align="center">Unlimited</td> </tr> <tr> <td>Electrode-Flux (Class) _____</td> <td align="center">NONE USED</td> <td align="center">NA</td> </tr> <tr> <td>Flux Trade Name _____</td> <td align="center">NONE USED</td> <td align="center">NA</td> </tr> <tr> <td>Consumable Instrt _____</td> <td align="center">None</td> <td align="center">NA</td> </tr> <tr> <td>Other _____</td> <td align="center">Bare (Solid wire)</td> <td align="center">Max. pass thk. < 1/2"</td> </tr> <tr> <td></td> <td align="center">Addition of flux: None</td> <td></td> </tr> </tbody> </table>		* FILLER METALS (QW-404)	GTAW Root	SMAW FILL	Spec. No. (SFA) _____	5.18	5.1	AWS No. (Class) _____	ER70S-2 or ER70S-6	E7018 or E7018-1	F-No. _____	6	4	A-No. _____	1 (verify that ER70S-6 meets A1 chemistry)	1	Size of Filler Metals _____	1/16", 3/32", 1/8"	3/32", 1/8", 5/32"	Weld Metal _____	No autogenous welding allowed		Thickness Range:			Groove _____	.250" (1/4") maximum deposit	.750" (3/4") max. deposit	Fillet _____	Unlimited	Unlimited	Electrode-Flux (Class) _____	NONE USED	NA	Flux Trade Name _____	NONE USED	NA	Consumable Instrt _____	None	NA	Other _____	Bare (Solid wire)	Max. pass thk. < 1/2"		Addition of flux: None	
* FILLER METALS (QW-404)	GTAW Root	SMAW FILL																																												
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F-No. _____	6	4																																												
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Fillet _____	Unlimited	Unlimited																																												
Electrode-Flux (Class) _____	NONE USED	NA																																												
Flux Trade Name _____	NONE USED	NA																																												
Consumable Instrt _____	None	NA																																												
Other _____	Bare (Solid wire)	Max. pass thk. < 1/2"																																												
	Addition of flux: None																																													

*Each base metal-filler metal combination should be recorded individually.

POSITIONS (QW-405) Positions(s) of Groove <u>All positions</u> Welding Progression: Up <u>Yes</u> Down _____ Position(s) of Fillet <u>All positions</u>	POSTWELD HEAT TREATMENT (QW-407) Temperature Range <u>As Welded Condition</u> Time Range <u>N/A</u>																				
PREHEAT (QW-406) Preheat Temp. Min. <u>3/16" to 1" = 55°F</u> Interpass Temp. Max. <u>550°F</u> Preheat Maintenance <u>None</u> (Continuous or special heating where applicable should be recorded)	GAS (QW-408) <table style="width:100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Gas(es)</td> <td style="text-align: center;">Percent Composition</td> <td style="text-align: center;">Flow rate</td> </tr> <tr> <td>GTAW</td> <td style="border-bottom: 1px solid black;"></td> <td style="border-bottom: 1px solid black;"></td> <td style="border-bottom: 1px solid black;"></td> </tr> <tr> <td>Shielding</td> <td style="border-bottom: 1px solid black;"><u>Argon</u></td> <td style="border-bottom: 1px solid black;"><u>99.995%</u></td> <td style="border-bottom: 1px solid black;"><u>20-50 CFH</u></td> </tr> <tr> <td>Trailing</td> <td style="border-bottom: 1px solid black;"><u>None</u></td> <td style="border-bottom: 1px solid black;"></td> <td style="border-bottom: 1px solid black;"></td> </tr> <tr> <td>Backing</td> <td style="border-bottom: 1px solid black;"><u>None</u></td> <td style="border-bottom: 1px solid black;"></td> <td style="border-bottom: 1px solid black;"></td> </tr> </table>		Gas(es)	Percent Composition	Flow rate	GTAW				Shielding	<u>Argon</u>	<u>99.995%</u>	<u>20-50 CFH</u>	Trailing	<u>None</u>			Backing	<u>None</u>		
	Gas(es)	Percent Composition	Flow rate																		
GTAW																					
Shielding	<u>Argon</u>	<u>99.995%</u>	<u>20-50 CFH</u>																		
Trailing	<u>None</u>																				
Backing	<u>None</u>																				

ELECTRICAL CHARACTERISTICS (QW-409)

Current AC or DC Below Polarity Below
 Amps (Range) Below Volts (Range) Below

(Amps and volts range should be recorded for each electrode size, position, and thickness, etc. This information may be listed in a tabular form similar to that shown below.)

Tungsten Electrode Size and Type EWTh-2 3/32" or 1/8"
 (Pure Tungsten, 2% Thoriated, etc.)

Mode of Metal Transfer for GMAW N/A
 (Spray arc, short circuiting arc, etc.)

Electrode Wire feed speed range N/A

TECHNIQUE (QW-410)

String or Weave Bead GTAW- weave SMAW- String or weave (3X rod dia. Max)

Orifice or Gas Cup Size GTAW: #4 - #12

Initial and Interpass Cleaning (Brushing, Grinding, etc.) All deleterious materials shall be removed 1" both sides of weld joint by grinding or wire brushing. Interpass cleaning with wire brush, chipping hammer or pneumatic scaling gun required.

Method of Back Gouging N/A for GTAW single side open root stringer deposit. Back gouge and/or grind second side for double side weld using the GTAW process if required.

Contact to Tube Work Distance N/A

Multiple or Single Pass (per side) Multiple

Multiple or Single Electrodes Single

Travel Speed (Range) See Below

Peening None

Other Oscillation: None Pulsing current: None

Weld Layer(s)	Process	Filler Metal		Current		Volt Range	Travel Speed Range	Other Max. J/in.
		Class	Dia.	Type Polar.	Amp Range			
Root & Hot pass	GTAW	ER70S-2 or ER70S-6	1/16", 3/32" 1/8"	DC/SP DC/SP	40-200 130-300	12-25 18-25	Manual Manual	
Fill & cap	SMAW	E7018 or E7018-1	3/32" 1/8" 5/32" 3/16"	DC/RP DC/RP DC/RP DC/RP	70-100 110-135 130-200 180-250	19-24 19-24 19-25 22-28	Manual Manual Manual Manual	

WELD PROCEDURE SPECIFICATION (WPS) JOINT DESIGNS
(Page 3 of 3)

WPS No.: 5004-A Date: 8-14-09 Rev. No.: 3 Date: 05MAR2015

JOINTS (QW-402)

Single-V groove: GTAW /SMAW	Single bevel groove: GTAW/SMAW
Backing: <u>No backing</u>	Backing: <u>No backing</u>
Root opening: <u>3/32" - 3/16"</u>	Root opening: <u>3/32" - 3/16"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>1/8" Max</u>	Root face: <u>1/8" Max</u>

Single-V groove:	Single bevel groove:
Backing: <u>Backgouged & welded</u>	Backing: <u>Backgouged & welded</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>1/4" Max.</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>3/16" Max.</u>

Double bevel groove:	Single J groove:
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" - 3/16"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>

Double V groove:	Single U groove:
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" - 3/16"</u>
Groove angle: <u>45 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>

Single or double fillet weld: GTAW/SMAW

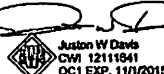
Backing: Base metal

Root opening: 3/16" Max.

Weld size: See drawings

- 1) Alternate weld joint designs may be shown on the drawings or engineering specifications and will take precedence.
- 2) Initial and interpass cleaning is shown on page 2 of the WPS.
- 3) Preheat shall be maintained during all thermal cutting, taking and backgouging operations as shown on the WPS.
- 4) Welds shall be cleaned as required on page 2 of the WPS.

Prepared By: <u>Tim Morris</u>	Approved By: 	Date: <u>11-22-12</u>
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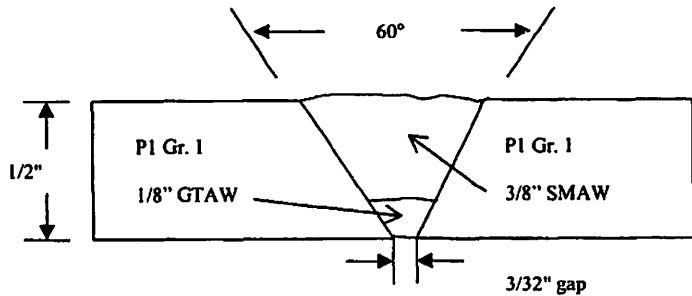


05MAR2015

QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
 (See QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
 Record Actual Conditions Used to Weld Test Coupon.

Company Name UNITED CONTRACTING SERVICES
 Procedure Qualification Record No. 5004-A Date 8-14-09
 WPS No. 5004-A
 Welding Processes(es) GAS TUNGSTEN ARC WELDING (GTAW) & SHIELDED METAL ARC WELDING (SMAW)
 Types (Manual, Automatic, Semi-auto.) GTAW/ SMAW : Manual

JOINTS (QW-402)



Groove Design of Test Coupon

*(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used)

BASE METALS (QW-103) Material Spec. <u>SA-106-B</u> Type or Grade <u>Gr. B</u> P No. <u>P 1 Gr. 1 to P 1 Gr. 1</u> Thickness of Test Coupon <u>1/2"</u> Diameter of Test Coupon <u>8.825"</u> Other <u>Qualifies T thk. 3/16" - 1" with no PWHT</u> <u>Qualifies GTAW t thk. 1/4" max.</u> <u>Qualifies SMAW t thk. 3/4" max.</u> <u>Max. bead thk. < 1/2"</u>		POSTWELD HEAT TREATMENT (QW-407) Temperature <u>As Welded</u> Time <u>N/A</u> Other _____																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:30%;">FILLER METALS (QW-404)</th> <th style="width:30%;">SMAW</th> <th style="width:30%;">GTAW</th> </tr> <tr> <td>SFA Specification</td> <td align="center"><u>5.1</u></td> <td align="center"><u>5.18</u></td> </tr> <tr> <td>AWS Classification</td> <td align="center"><u>E7018</u></td> <td align="center"><u>ER70S-2</u></td> </tr> <tr> <td>Filler metal F-No.</td> <td align="center"><u>4</u></td> <td align="center"><u>6</u></td> </tr> <tr> <td>Weld Metal Analysis A-No.</td> <td align="center"><u>1</u></td> <td align="center"><u>1</u></td> </tr> <tr> <td>Size of Filler Metal</td> <td align="center"><u>1/8"</u></td> <td align="center"><u>1/8"</u></td> </tr> <tr> <td>Other <u>GTAW :Solid wire</u></td> <td></td> <td></td> </tr> <tr> <td><u>Consumable inserts: None</u></td> <td></td> <td></td> </tr> <tr> <td><u>Addition of flux for GTAW: None</u></td> <td></td> <td></td> </tr> <tr> <td>Weld Metal Thickness</td> <td align="center"><u>3/8" *</u></td> <td align="center"><u>1/8"</u></td> </tr> <tr> <td>Max. pass thk. <1/2"</td> <td></td> <td align="center"><u>With filler*</u></td> </tr> </table>		FILLER METALS (QW-404)	SMAW	GTAW	SFA Specification	<u>5.1</u>	<u>5.18</u>	AWS Classification	<u>E7018</u>	<u>ER70S-2</u>	Filler metal F-No.	<u>4</u>	<u>6</u>	Weld Metal Analysis A-No.	<u>1</u>	<u>1</u>	Size of Filler Metal	<u>1/8"</u>	<u>1/8"</u>	Other <u>GTAW :Solid wire</u>			<u>Consumable inserts: None</u>			<u>Addition of flux for GTAW: None</u>			Weld Metal Thickness	<u>3/8" *</u>	<u>1/8"</u>	Max. pass thk. <1/2"		<u>With filler*</u>	GAS (QW-408) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th rowspan="2"></th> <th colspan="3">Percent Composition</th> </tr> <tr> <th>Gas(es)</th> <th>(Mixture)</th> <th>Flow rate</th> </tr> <tr> <td>Shielding</td> <td align="center"><u>Argon</u></td> <td align="center"><u>99.995%</u></td> <td align="center"><u>40 CFH</u></td> </tr> <tr> <td>Trailing</td> <td align="center"><u>None</u></td> <td></td> <td></td> </tr> <tr> <td>Backing</td> <td align="center"><u>None</u></td> <td></td> <td></td> </tr> <tr> <td>Other</td> <td></td> <td></td> <td></td> </tr> </table>			Percent Composition			Gas(es)	(Mixture)	Flow rate	Shielding	<u>Argon</u>	<u>99.995%</u>	<u>40 CFH</u>	Trailing	<u>None</u>			Backing	<u>None</u>			Other			
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Backing	<u>None</u>																																																										
Other																																																											
POSITION (QW-405) Position of Groove <u>6G</u> Weld Progression (Uphill, Downhill) <u>Uphill</u> Other _____		ELECTRICAL CHARACTERISTICS (QW-409) Current <u>GTAW: DC</u> <u>SMAW: DC</u> Polarity <u>GTAW: SP</u> <u>SMAW: RP</u> Amps <u>GTAW: 130</u> <u>SMAW: 98</u> Volts <u>GTAW: 19</u> <u>SMAW: 19</u> Tungsten Electrode Size <u>1/8" dia. EWTh-2</u> Pulsing Amps <u>None</u> J/in. Qualified (CVN's) <u>N/A</u> Other _____																																																									
PREHEAT (QW-406) Preheat Temp. (min.) <u>70°F</u> Interpass Temp. (max.) <u>550°F</u> Other _____		TECHNIQUE (QW-410) Travel Speed <u>Manual</u> String or Weave Bead <u>GTAW: Weave</u> <u>SMAW: String</u> Oscillation <u>None</u> Multipass or Single Pass (per side) <u>Multipass</u> Single or Multiple Electrodes <u>Single</u> Other _____																																																									

*Corrected SMAW deposit from 1/2" to 3/8" and added with filler addition to GTAW process. Recertified 10-22-10

QW-482 SUGGESTED FORMAT FOR WELDING PROCEDURE SPECIFICATION (WPS)
 (See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name U CONTRACTING SERVICES INC. By: Juston Davis Approved by: Jose R. Estada
 Welding Procedure Specification No. 5011A Date 4/18/12 Supporting PQR No.(s) 5011A
 Revision No. 3 Date 11-23-2016
 Welding Process(es) GMAW/FCAW Type(s) Semi-Auto/Semi-Auto
 (Automatic, Manual, Machine, Semi-auto)

Joints (QW-402)	Details
Joint Design <u>Any*</u>	See page 3 of WPS for joint design details. *1 See shop drawings for optional joint designs used with this WPS.
Root Spacing <u>SEE SHEET 3</u>	
Backing (Yes) <u>FCAW</u> (No) <u>GMAW</u>	
Backing Material (type) <u>PER CUSTOMER REQUIREMENT</u> (Refer to both backing and retainers.)	
<input checked="" type="checkbox"/> Metal <input type="checkbox"/> Nonfusing Metal <input type="checkbox"/> Nonmetallic <input type="checkbox"/> Other	
Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.	
(At the option of the Mfr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process, procedures, etc.)	
This WPS may be used in conjunction with other WPS' as indicated on shop drawings. (Ex. Used for repair or root pass.)	

*** BASE METALS (QW-403)**
 P-No. 1 Group No. 1 or 2 to P-No. 1 Group No. 1 or 2
 OR
 Specification type and grade EXAMPLE: SA-516-60
 To Specification type and grade EXAMPLE: SA516-70
 OR
 Chem. Analysis and Mech. Prop. SEE P NO. ABOVE
 To Chem. Analysis and Mech. Prop. SEE P NO. ABOVE
 Thickness Range:
 Base Metal: Groove 3/16"~1.5" Fillet UNLIMITED
 Maximum Pass Thickness ≤ ½ in. (Yes) X (No) _____
 Other Not allowed for ASME Services greater than 1.5". Thicknesses between 1.0~1.25" shall have a minimum pre-heat of 175°F and thicknesses from 1.25~1.5" shall have a minimum pre-heat of 200°F.

* FILLER METALS (QW-404)	FCAW	GMAW
Spec. No. (SFA)	<u>5.20/5.36</u>	<u>5.17/5.18</u>
AWS No. (Class)	<u>E71T-M1/E71T1-M21A2</u>	<u>ER70S-3 or ER70S-6</u>
F-No.	<u>6</u>	<u>6</u>
A-No.	<u>1 (VERIFY E71T-M MEETS A1 CHEM.)</u>	<u>1 (VERIFY ER70S-6 MEETS A1 CHEM.)</u>
Size of Filler Metals	<u>0.045", 1/16"</u>	<u>0.035", 0.045"</u>
Filler Metal Product Form	<u>TUBULAR</u>	<u>BARE WIRE</u>
Supplemental Filler Metal	<u>NONE ALLOWED</u>	<u>NONE ALLOWED</u>
Weld Metal		
Thickness Range:		
Groove	<u>3/16"~1.375"</u>	<u>0.062"~0.250"</u>
Fillet	<u>UNLIMITED</u>	<u>UNLIMITED</u>
Electrode-Flux (Class)	<u>NO ADDITIONAL FLUX ADDED</u>	<u>NO ADDITIONAL FLUX ADDED</u>
Flux Trade Name	<u>NONE</u>	<u>NONE</u>
Consumable Insert	<u>NONE</u>	<u>NONE</u>
Other	<u>NO ALLOYING ELEMENTS</u>	<u>NO ALLOYING ELEMENTS</u>

*Each base metal-filler metal combination should be recorded individually.

POSITIONS (QW-405) Positions(s) of Groove <u>ALL</u> Welding Progression: Up <u>FCAW</u> Down <u>GMAW</u> Position(s) of Fillet <u>ALL</u> Other _____	POSTWELD HEAT TREATMENT (QW-407) Temperature Range <u>N/A</u> Time Range <u>N/A</u> Other _____																				
PREHEAT (QW-406) Preheat Temp. Min. <u>50°F</u> Interpass Temp. Max. <u>500°F MAX.</u> Preheat Maintenance <u>NONE AFTER WELDING</u> (Continuous or special heating where applicable should be recorded)	GAS (QW-408) Percent Composition <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;"></td> <td style="width:33%;">Gas(es)</td> <td style="width:33%;">Mixture</td> <td style="width:33%;">Flow rate</td> </tr> <tr> <td>Shielding</td> <td><u>AR/CO2</u></td> <td><u>75/25</u></td> <td><u>30~50CHF</u></td> </tr> <tr> <td>Trailing</td> <td><u>NONE</u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Backing</td> <td><u>NONE</u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Other</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </table>		Gas(es)	Mixture	Flow rate	Shielding	<u>AR/CO2</u>	<u>75/25</u>	<u>30~50CHF</u>	Trailing	<u>NONE</u>	_____	_____	Backing	<u>NONE</u>	_____	_____	Other	_____	_____	_____
	Gas(es)	Mixture	Flow rate																		
Shielding	<u>AR/CO2</u>	<u>75/25</u>	<u>30~50CHF</u>																		
Trailing	<u>NONE</u>	_____	_____																		
Backing	<u>NONE</u>	_____	_____																		
Other	_____	_____	_____																		

ELECTRICAL CHARACTERISTICS (QW-409)

Weld Layer(s)	Process	Filler Metal		Current		Volt Range	IPM Travel Speed Range	Wire Feed Speed Range	Energy or Power Range	(e.g. Remarks Comment Technique)
		Class	Dia.	Type Polar.	Amp Range					
ROOT	GMAW	ER70S-3 or ER70S-6	.035"	DC/RP	115~145	18~23	MAN.	VAR.	*	
FILL/ CAP	FCAW	E71T-M	.045"	DC/RP	140~240	22~29	MAN.	VAR.	*	
	FCAW	E71T-M	1/16"	DC/RP	220~380	22~32	MAN.	VAR.	*	

Amps and volts, or power or energy range, should be recorded for each electrode size

Pulsing Current NONE Heat Input Range. *NOT REQUIRED FOR IMPACT EXEMPT APPLICATIONS
 Tungsten Electrode size NONE
 Mode of Transfer for GMAW (FCAW) GMAW-GLOB., FCAW-GLOB. or SPRAY
 Other _____

TECHNIQUE (QW-410)

String or Weave Bead GMAW- STRING or WEAVE, FCAW-STRING (3/4" MAX.)
 Orifice or Gas Cup Size 5/16" or 3/8" I.D.
 Initial and Interpass Cleaning (Brushing, Grinding, etc. All deleterious materials shall be removed 1" both sides of weld joint by grinding or wire brushing. GMAW - WIRE BRUSH EACH PASS REQUIRED.
FCAW - Interpass cleaning with wire brush, chipping hammer, or pneu. Scaling gun required.
 Method of Back Gouging N/A for single side w/ no access to second side; grinding optional if second side accessible.
FCAW may be used for dbl. sided welding with sec. side back gouged to bright metal & welded w/FCAW
 Oscillation None
 Contact to Tube Work Distance 1/2" ~ 1-1/4"
 Multiple or Single Pass (per side) MULT.
 Multiple or Single Electrodes SINGLE
 Electrode Spacing NONE
 Peening NONE ALLOWED
 Other NO OCCILATION

PROCEDURE SPECIFICATION (WPS) JOINT DESIGNS
(Page 3 of 3)

WPS No.: 5011A Date: 4-18-12 Rev. No.: 3 Date: 11-23-16

JOINTS (QW-402)

Single-V groove: GMAW/FCAW	Single bevel groove: GMAW/FCAW
Backing: <u>No backing</u>	Backing: <u>No backing</u>
Root opening: <u>3/32"~3/16"</u>	Root opening: <u>3/32"~3/16"</u>
Groove angle: <u>50° Min. included</u>	Groove angle: <u>45° Min. included</u>
Root face: <u>1/8" Max.</u>	Root face: <u>1/8" Max.</u>
Single-V groove: GMAW/FCAW	Single bevel groove: GMAW/FCAW
Backing: <u>Backgouged & welded</u>	Backing: <u>Backgouged & welded</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>1/4" Max.</u>
Groove angle: <u>50° Min. included</u>	Groove angle: <u>45° Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>3/16" Max.</u>
Double bevel groove: GMAW/FCAW	Single J groove: GMAW/FCAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32"~3/16"</u>
Groove angle: <u>50° Min. included</u>	Groove angle: <u>15° Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max.</u>
Double V groove: GMAW/FCAW	Single U groove: GMAW/FCAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32"~3/16"</u>
Groove angle: <u>45° Min. included</u>	Groove angle: <u>15° Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max.</u>
Single or double fillet weld: GMAW/FCAW	
Backing: <u>Base metal</u>	
Root opening: <u>3/16" Max.</u>	
Weld size: <u>See drawing details</u>	

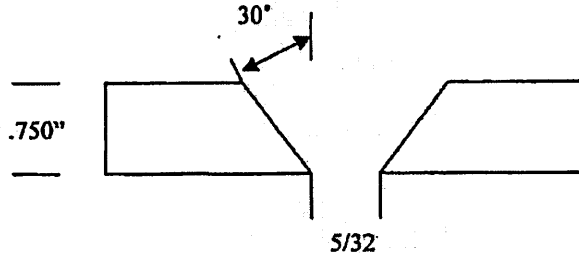
- 1) Alternate weld joint designs may be shown on the drawings or engineering specifications and will take precedence.
- 2) Initial and interpass cleaning is shown on page 2 of the WPS.
- 3) Preheat shall be maintained during all thermal cutting, tacking and backgouging operations as shown on the WPS.
- 4) Welds shall be cleaned as required on page 2 of the WPS.

Prepared By: <u>Juston Davis</u>	Approved By: <u>Jose R. Stada</u>	Date: <u>11/23/16</u>
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QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
 (See QW-200.0 Section IX, ASME Boiler and Pressure Vessel Code)
 Record Actual Conditions Used to Weld Test Coupon.

Company UNITED CONTRACTING SERVICES
 PQR No. 5011 Date 4-18-12
 WPS No. 5011-A Welding Process(es) GMAW/FCAW
 Types (Manual, Automatic, Semi-Auto) SEMI-AUTO

JOINTS (QW-402)



Groove Design of Test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used.)

BASE METALS (QW-403)
 Material Spec. SA516
 Type or Grade 70
 P-No. 1 Gr. 1 to P-No. 1 Gr. 1
 Thickness of Test Coupon 0.750"
 Diameter of Test Coupon N.A.
 Maximum Pass Thickness 0.250"
 Other OPEN ROOT, NO BACKING

POSTWELD HEAT TREATMENT (W-407)
 Temperature N/A
 Time N/A
 Other _____

GAS (QW-408)

	Percent Composition		
	Gas(es)	Mixture	Flow Rate
Shielding	<u>ARGON/CO2</u>	<u>75/25</u>	<u>35 CFH</u>
Trailing	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Backing	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

FILLER METALS (QW-404)

SFA Specification	<u>5.18</u>	<u>5.20</u>
AWS Classification	<u>ER70S-6</u>	<u>E71T-1M</u>
Filler Metal F-No.	<u>6</u>	<u>6</u>
Weld Metal Analysis A-No.	<u>1</u>	<u>1</u>
Size of Filler Metal	<u>0.035"</u>	<u>0.045"</u>
Filler Metal Product Form	<u>SOLID</u>	<u>TUBULAR</u>
Supplemental Filler Metal	<u>NONE</u>	<u>NONE</u>
Electrode Flux Classification	<u>N/A</u>	<u>N/A</u>
Flux Type	<u>N/A</u>	<u>N/A</u>
Flux Trade Name	<u>N/A</u>	<u>N/A</u>
Weld Metal Thickness	<u>0.125"</u>	<u>0.437"</u>
Other	_____	

ELECTRICAL CHARACTERISTICS (QW-409)
 Current DCEP /DCEP
 Polarity REVERSE /REVERSE
 Amps. 130 / 150 Volts 21/23
 Tungsten Electrode Size N/A
 Mode of Transfer for GMAW (FCAW) SEE BELOW
 Other GMAW: GLOBULAR FCAW: GLOBULAR

POSITION (QW-405)
 Position of Groove IG
 Weld Progression N.A.
 Other N/A

TECHNIQUE (QW-410)
 Travel Speed 12 IPM
 String or Weave Bead STRINGER
 Oscillation NONE
 Multipass or Single Pass (per side) MULTIPASS
 Single or Multiple Electrodes SINGLE
 Other _____

PREHEAT (QW-406)
 Preheat Temp. AMBIENT (70°F)
 Interpass Temp. 475°F MAX
 Other _____

QC Approved
 By H.S.
 Date 4/18/12

TULSA GAMMA RAY, INC.

1127 S Lewis Ave. Tulsa, OK 74104
 PH 918-585-3228 FX 918-598-5584

PQR No. 5011-A

Tensile Test (QW-150)

Specimen No.	Width	Thickness	Area	Ultimate Total Load lb.	Ultimate Unit Stress psi	Type of Failure & Location
1 (0.755"	0.714"	0.5391	44,191	81,972	DUCTILE BASE METAL
2	0.755"	0.722"	0.5451	44,190	74,249	DUCTILE BASE METAL

Guided-Bend Tests (QW-160)

Type and Figure No.	Result
SIDE FIG. 462.3(a) 102131246	PASS NO RELEVANT INDICATIONS GREATER THAN 1/8"
SIDE FIG. 462.3(a) 102131246	PASS NO RELEVANT INDICATIONS GREATER THAN 1/8"
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SIDE FIG. 462.3(a) 102131246	PASS NO RELEVANT INDICATIONS GREATER THAN 1/8"

Toughness Tests (QW-170) N/A

Specimen No.	Notch Location	Specimen Size	Test Temp.	Impact Values			Drop Weight Break (Y/N)
				Ft. lbs	Lateral Expansion	% Shear	
1	WM 1/16" ROOT	10mm x 10mm	-20°F	23	19	55	N
2	WM 1/16" ROOT	10mm x 10mm	-20°F	19	17	50	N
3	WM 1/16" ROOT	10mm x 10mm	-20°F	13	13	45	N
4	WM 1/16" CAP	10mm x 10mm	-20°F	32	28	45	N
5	WM 1/16" CAP	10mm x 10mm	-20°F	23	22	50	N
6	WM 1/16" CAP	10mm x 10mm	-20°F	34	27	50	N
7	HAZ	10mm x 10mm	-20°F	18	18	40	N
8	HAZ	10mm x 10mm	-20°F	15	21	45	N
9	HAZ	10mm x 10mm	-20°F	16	19	45	N

Comments: _____

Fillet-Weld Test (QW-180) N/A

Result-Satisfactory Yes _____ No _____ Penetration into Parent Metal: Yes _____ No _____

Macro-Results _____

Other Tests

Type of Test _____

Deposit Analysis _____

Other _____

Welder's Name JORGE PANDO Clock No. _____ Stamp No. _____

Tests Conducted By Tulsa Gamma Ray, Inc. J.P. Laboratory Test No. 102131246

We certify that the statements in this record are correct and that the test welds were prepared, welded, and attested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer UNITED CONTRACTING SERVICES

Date 4/18/12 By H. T. Edwards

UNITED CONTRACTING SERVICES

Tulsa, Ok.

QW-482 SUGGESTED FORMAT FOR WELDING PROCEDURE SPECIFICATIONS (WPS) (See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)

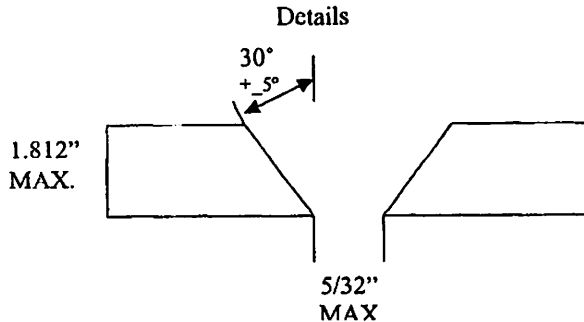
Company Name UNITED CONTRACTING SERVICES Approved by / Date *[Signature]* 8-21-13
 WPS No: 5012-A Date 6-1-12 Supporting PQR No. (s) 5012
 Revision No. 2 Date of Rev. 8-21-13 Added "with filler Addition" comment

Welding Process(es) GTAW Type MANUAL
(Automatic, Manual, Machine, or Semi-Auto)

JOINTS (QW-402)

Joint Design Any
 Backing With or without
 Backing Material (Type) Per customer requirement
Refer to both backing and retainers

- Metal Nonfusing Metal
 Nonmetallic Other
 No nonmetallic or non-fusing metal retainers used.



Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfr. / sketches may be attached to V, J or U bevel grooves, fillets or other joints detailed on engineering drawings, production routing or repair procedures. illustrate joint design, weld layers and bead sequence, e.g., for notch toughness procedures, for multiple process procedures, etc.)

BASE METALS (QW-403)

No. 1 Group No. 1 or 2 to P-No. 1 Group No. 1 or 2

OR
 Specification type and grade or UNS Number _____
 to Specification type and grade or UNS Number _____
 OR

Chem. Analysis and Mech. Prop _____
 To Chem. Analysis and Mech. Prop _____

Thickness Range:
 Base Metal: Groove 0.1875" TO 1.812" MAX Fillet UNLIMITED
 Diameter Groove UNLIMITED Fillet UNLIMITED
 Maximum Pass Thickness $\leq \frac{1}{2}$ in. (13mm)

Other No pass greater than 1/2"

***FILLER METALS (QW-404)**

Spec. No. (SFA) 5.18
 AWS No. (Class) ER70S-6/ER70S-2
 F-No. 6
 A-No. 1(Verify Chemistry)
 Size of Filler Metals 3/32", 1/8"
 Filler Metal Product Form SOLID
 Supplemental Filler Metal NONE
 Weld Metal
 Thickness Range:
 Groove 1.812"
 Fillet ANY
 Electro-Flux (Class) N.A.
 Max Trade Name N.A.
 Consumable Insert N.A.
 Other With Filler Addition

*Each base metal-filler metal combination should be recorded individually.

UNITED CONTRACTING SERVICES

Tulsa, Ok.

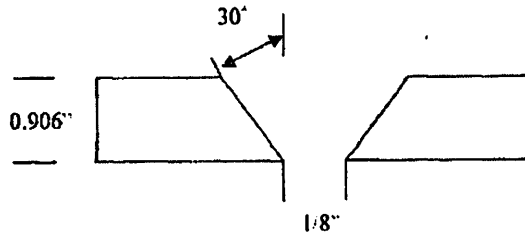
WPS No. 5012-A				Rev. 2				
POSITIONS (QW-405)				POSTWELD HEAT TREATMENT (QW-407)				
Position(s) of Groove		ALL		Temp Range		N.A.		
Welding Progression:		<input type="checkbox"/> DOWN <input checked="" type="checkbox"/> Up		Time Range		N.A.		
Position(s) of Fillet		ALL		Other				
Other								
PREHEAT (QW-406)				GAS (QW-408)		Percent Composition		
Preheat Temp. Min.		50°		Gas(es)				
Interpass Temp. Max.		550°		Shielding		Mixture		
Preheat Maintenance				Trailing		Flow Rate		
Other				Backing		Argon		
(Continuous or special heating where applicable should be recorded)				Other		N.A.		
				N.A.		100		
				N.A.		20-35 CFH		
				N.A.		N.A.		
				N.A.		N.A.		
ELECTRICAL CHARACTERISTICS (QW-409)								
Weld Pass(es)	Process	Filler Metal		Current		Volt Range	Travel Speed (Range)	Other ; Remarks And Comments
		Class	Dia.	Type Polar	Amp. Range			
ALL	GTAW	ER70S-6 OR ER70S-2	3/32" OR 1/8"	DCEN	75-150	10-13	3-7 ipm	
ALL	GTAW	ER70S-6 OR ER70S-2	3/32" OR 1/8"	DCEN	75-150	10-13	3-8 ipm	
Amps and volts range should be recorded for each electrode size, position, and thickness, etc.								
Pulsing Current		N/A			Heat Input (max.)		N/A	
Tungsten Electrode Size and Type: 3/32" or 1/8" EWTh-2								
(Pure Tungsten, 2% Thoriated, etc.)								
Mode of Metal Transfer for GMAW (FCAW): N/A								
(Spray Arc, Short Circuiting Arc, etc.)								
Electrode Wire Feed Speed Range: N/A								
Other:								
TECHNIQUE (QW-410)								
String or Weave Bead: STRING or WEAVE								
Orifice, Nozzle or Gas Cup Size: #4 TO #12								
Initial and Interpass Cleaning (brushing, Grinding, etc.) BRUSHING AND GRINDING AS NEEDED								
Method of Back Gouging CARBON ARC GOUGHING								
Oscillation: NONE								
Contact Tube to Work Distance: N/A								
Multiple or Single (per side): MULTIPASS								
Multiple or Single Electrodes: SINGLE								
Electrode Spacing: N/A								
Peening: NONE ALLOWED								
Other:								

TULSA GAMMA RAY, INC.

1127 S Lewis Ave. Tulsa, OK 74104
PH 918-585-3228 FX 918-598-5584

QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
(See QW-200.0 Section IX, ASME Boiler and Pressure Vessel Code)
Record Actual Conditions Used to Weld Test Coupon.

Company UNITED CONTRACTING SERVICES
PQR No. 5012 Date 6-1-12 Corrected Deposited Filler Metal Thickness & Typos Date: 8-21-13
WPS No. 5012-A Welding Process(es) GTAW
Types (Manual, Automatic, Semi-Auto) MANUAL
JOINTS (QW-402)



Groove Design of Test Coupon

(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used.)

BASE METALS (QW-403)
Material Spec. SA106
Type or Grade B
P-No. 1 Gr. I to P-No. 1 Gr. I
Thickness of Test Coupon 0.906"
Diameter of Test Coupon N.A.
Maximum Pass Thickness 0.250"
Other OPEN ROOT, NO BACKING

POSTWELD HEAT TREATMENT (W-407)
Temperature N/A
Time N/A
Other _____

FILLER METALS (QW-404)
SFA Specification 5.18
AWS Classification ER70S-6
Filler Metal F-No. 6
Weld Metal Analysis A-No. 1
Size of Filler Metal 3/32"
Filler Metal Product Form SOLID
Supplemental Filler Metal NONE
Electrode Flux Classification N/A
Flux Type N/A
Flux Trade Name N/A
Weld Metal Thickness 0.906"
Other With filler addition

GAS (QW-408)

	Percent Composition		
	Gas(es)	Mixture	Flow Rate
Shielding	ARGON	100%	35 CFH
Trailing	N/A	N/A	N/A
Backing	N/A	N/A	N/A

POSITION (QW-405)
Position of Groove 1G
Weld Progression N.A.
Other N/A

ELECTRICAL CHARACTERISTICS (QW-409)
Current DCEN
Polarity STRAIGHT
Amps. 130 Volts 19
Tungsten Electrode Size 1/8" EWTh-2
Mode of Transfer for GMAW (FCAW) N/A
Other N/A

PREHEAT (QW-406)
Preheat Temp AMBIENT (90°F)
Interpass Temp. 475°F MAX
Other _____

TECHNIQUE (QW-410)
Travel Speed 10 IPM
String or Weave Bead STRINGER
Oscillation NONE
Multipass or Single Pass (per side) MULTIPASS
Single or Multiple Electrodes SINGLE
Other _____

TULSA GAMMA RAY, INC.

1127 S Lewis Ave. Tulsa, OK 74104
 PH 918-585-3228 FX 918-598-5584

QW-483 (BACK)

PQR No. 5012

Specimen No.	Width	Thickness	Tensile Test (QW-150)		Ultimate Unit Stress psi	Type of Failure & Location
			Area	Ultimate Total Load lb.		
1	0.748	0.893	0.6679	53,726	80,440	DUCTILE BASE METAL
2	0.753	0.905	0.6814	51,064	74,940	DUCTILE BASE METAL

Guided-Bend Tests (QW-160)

Type and Figure No.	Result
SIDE FIG. 462.2	PASS NO RELEVANT INDICATIONS GREATER THAN 1/8"
SIDE FIG. 462.2	PASS NO RELEVANT INDICATIONS GREATER THAN 1/8"
SIDE FIG. 462.2	PASS NO RELEVANT INDICATIONS GREATER THAN 1/8"
SIDE FIG. 462.2	PASS NO RELEVANT INDICATIONS GREATER THAN 1/8"

Hardness Test- Brinell Hardness

Location	Readings		
	1	2	3
HAZ	162	176	226
WELD	200	210	198
HAZ	196	176	185

Comments:

Filler-Weld Test (QW-180) N/A

Result-Satisfactory Yes No Penetration into Parent Metal: Yes No

Macro-Results

Other Tests N/A

Type of Test

Deposit Analysis

Other

Welder's Name JORGE PANDO Clock No. _____ Stamp No. A

Tests Conducted By Tulsa Gamma Ray, Inc. Laboratory Test No. 102131720

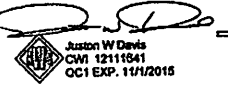
We certify that the statements in this record are correct and that the test welds were prepared, welded, and attested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer UNITED CONTRACTING SERVICES

Date 8-21-13

By [Signature]

QW-482 SUGGESTED FORMAT FOR WELDING PROCEDURE SPECIFICATION (WPS)
 (See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)



Company Name UNITED CONTRACTING SERVICES By: Tim Morris Approved By: _____
 Welding Procedure Specification No. GT-1-1.2 -50CVN Date 11-18-14 Supporting PQR No.(s) 14-14534
 Revision No. 0 Date N/A
 Welding Process(es) GAS TUNGSTEN ARC WELDING (GTAW) Type(s) Manual
 (Automatic,Manual,Machine,Semi-auto)

<p>Joints (QW-402)</p> <p>Joint Design <u>Single Vee or Bevel , Double Vee or Bevel, Fillet</u></p> <p>Root Spacing <u>3/32" to 3/16"</u></p> <p>Backing (Yes) <u>Optional</u> (No) <u>GTAW- open root</u></p> <p>Backing Material (type) <u>Weld metal or base metal</u> (Refer to both backing and retainers.)</p> <p><input checked="" type="checkbox"/> Metal <input type="checkbox"/> Nonfusing Metal <input type="checkbox"/> Nonmetallic <input type="checkbox"/> Other</p> <p>Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.</p> <p>(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process, procedures, etc.)</p>	<p>Details</p> <p>See page 3 of WPS for joint design details.</p> <p>*1 See shop drawings for optional joint designs used with this WPS.</p> <p>This WPS may be used in conjunction with other WPS* as indicated on shop drawings. (Ex. Used for repair or root pass.)</p>
---	---

*** BASE METALS (QW-403)**

P-No. 1 Group No. 1 or 2 to P-No. 1 Group No. 1 or 2

OR

Specification type and grade Ex: SA-106-B

To Specification type and grade Ex: SA-105

OR

Chem. Analysis and Mech. Prop. _____

To Chem. Analysis and Mech. Prop. _____

Thickness Range:

Base Metal: Groove 3/8" to 3/4" Fillet Unlimited

Maximum Pass Thickness ≤ 1/2 in. (Yes) X (No) _____

Other _____

* FILLER METALS (QW-404)	GTAW	
Spec. No. (SFA)	5.18	
AWS No. (Class)	ER70S-6	
F-No.	6	
A-No.	1 *	*ER70S-6 weld cert. must meet
Size of Filler Metals	1/16", 3/32", 1/8"	1.60% max. Mn and 1.0% max. Si
Filler Metal Product Form	Solid (bare) wire	to meet A1 chemistry.
Supplemental Filler Metal	None	
Weld Metal		
Thickness Range:		
Groove	5/8" maximum deposit.**	
Fillet	Unlimited	
Electrode-Flux (Class)	None used for aid in penetration	
Flux Trade Name	N/A	
Consumable Insert	None	
Other	** Due to the mismatch on the coupon, the mechanical testing and CVN's were taken from 5/16" thk. machined material.	

*Each base metal-filler metal combination should be recorded individually.

POSITIONS (QW-405) Positions(s) of Groove <u>1G & 2G</u> Welding Progression: Up <u>N/A</u> Down <u>N/A</u> Position(s) of Fillet <u>1F & 2F</u> Other _____	POSTWELD HEAT TREATMENT (QW-407) Temperature Range <u>None (As welded condition)</u> Time Range <u>N/A</u> Other <u>N/A</u>																				
PREHEAT (QW-406) Preheat Temp. Min. <u>60° F</u> Interpass Temp. Max. <u>450° F</u> Preheat Maintenance <u>None after completion of weldment.</u> (Continuous or special heating where applicable should be recorded)	GAS (QW-408) Percent Composition <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;"></td> <td style="width:35%;">Gas(es)</td> <td style="width:35%;">Mixture</td> <td style="width:15%;">Flow rate</td> </tr> <tr> <td>Shielding</td> <td><u>Argon</u></td> <td><u>99.995%</u></td> <td><u>25-40 CFH</u></td> </tr> <tr> <td>Trailing</td> <td><u>None</u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Backing</td> <td><u>None</u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Other</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </table>		Gas(es)	Mixture	Flow rate	Shielding	<u>Argon</u>	<u>99.995%</u>	<u>25-40 CFH</u>	Trailing	<u>None</u>	_____	_____	Backing	<u>None</u>	_____	_____	Other	_____	_____	_____
	Gas(es)	Mixture	Flow rate																		
Shielding	<u>Argon</u>	<u>99.995%</u>	<u>25-40 CFH</u>																		
Trailing	<u>None</u>	_____	_____																		
Backing	<u>None</u>	_____	_____																		
Other	_____	_____	_____																		

ELECTRICAL CHARACTERISTICS (QW-409)

Weld Layer(s)	Process	Filler Metal		Current		Volt Range	IPM Travel Speed Range	Wire Feed Speed Range	Energy or Power Range	(e.g. Remarks Comment Technique)
		Class	Dia.	Type Polar.	Amp Range					
	GTAW	ER70S-6	1/16"	DC/SP	70-120	14-21	2.8-6	N/A	*	
	GTAW	ER70S-6	3/32"	DC/SP	80-150	14-21	2.8-7	N/A		
	GTAW	ER70S-6	1/8"	DC/SP	120-150	15-21	2.8-8	N/A		

Amps and volts, or power or energy range, should be recorded for each electrode size

Pulsing Current None Heat Input Range. 67,500 J/in. maximum qualified
 Tungsten Electrode size 3/32" or 1/8" EWTh-2
 Mode of Transfer for GMAW (FCAW) N/A
 Other * Power range is not recorded.

TECHNIQUE (QW-410)

String or Weave Bead String or weave bead
 Orifice or Gas Cup Size #6 - #10
 Initial and Interpass Cleaning (Brushing, Grinding, etc.) All deleterious materials shall be removed 1" both sides of weld joint by grinding or wire brushing or descaling. Light flash rust after grinding or descaling is acceptable.
Interpass cleaning with wire brush, grinding or chatter gun.
 Method of Back Gouging Double side weld- Air carbon arc and/or grind second side to sound metal. NA for fillet welds or open root.
 Oscillation None
 Contact to Tube Work Distance N/A
 Multiple or Single Pass (per side) Multiple
 Multiple or Single Electrodes Single
 Electrode Spacing Manual
 Peening None
 Other _____


PROCEDURE SPECIFICATION (WPS) JOINT DESIGNS
(Page 3 of 3)

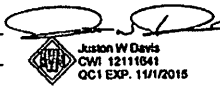
WPS No.: GT-1-1.2 -50CVN Date: 11-18-14 Rev. No.: 0 Date: N/A

JOINTS (QW-402)

Single-V groove: GTAW	Single bevel groove: GTAW
Backing: <u>No backing</u>	Backing: <u>No backing</u>
Root opening: <u>3/32" – 1/4"</u>	Root opening: <u>3/32" – 1/4"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>1/8" Max</u>	Root face: <u>1/8" Max</u>
Single-V groove: GTAW	Single bevel groove: GTAW
Backing: <u>Backgouged & welded</u>	Backing: <u>Backgouged & welded</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>1/4" Max.</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>3/16" Max.</u>
Double bevel groove: GTAW	Single J groove: GTAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" – 3/16"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>
Double V groove: GTAW	Single U groove: 3/4" U GTAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" – 3/16"</u>
Groove angle: <u>45 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>
Single or double fillet weld: GTAW	
Backing: <u>Base metal</u>	
Root opening: <u>3/16" Max.</u>	
Weld size: <u>See drawings</u>	

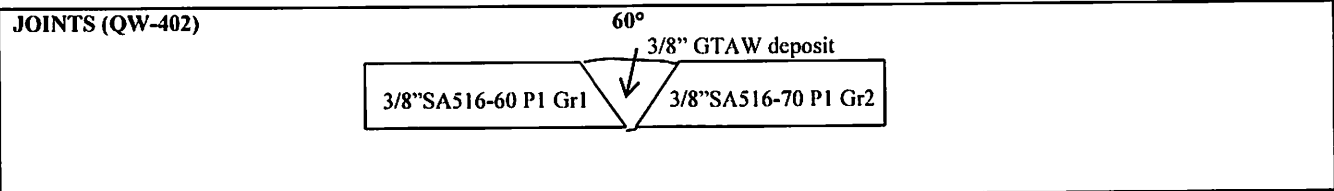
- 1) Alternate weld joint designs may be shown on the drawings or engineering specifications WS 1.00-10 and will take precedence.
- 2) Initial and interpass cleaning is shown on page 2 of the WPS.
- 3) Preheat shall be maintained during all thermal cutting, taking and backgouging operations as shown on the WPS.
- 4) Welds shall be cleaned as required on page 2 of the WPS.

Prepared By: Tim Morris Approved By:  Date:



QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
 (See QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
 Record Actual Conditions Used to Weld Test Coupon.

Company Name UNITED CONTRACTING SERVICES
 Procedure Qualification Record No. 14-14534 Date 11-18-14
 WPS No. GT-1-1.2 -50 CVN
 Welding Processes(es) GAS TUNGSTEN ARC WELDING (GTAW)
 Types (Manual, Automatic, Semi-auto.) Manual



Groove Design of Test Coupon
 *(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used)

BASE METALS (QW-403)		POSTWELD HEAT TREATMENT (QW-407)	
Material Spec. <u>SA-516-60 to SA-516-70</u>	Type or Grade <u>Dual certified plate</u>	Temperature <u>None (As welded)</u>	Time <u>N/A</u>
P No. <u>1</u> Gr. No. <u>1</u> to P No. <u>1</u> Gr. No. <u>2</u>	Thickness of Test Coupon <u>3/8"</u>	Other <u>N/A</u>	
Diameter of Test Coupon <u>N/A</u> (plate test)	Max. pass thk. <u>< 1/2"</u>	GAS (QW-408)	
Other <u>SA-516-60/70 Nucor Ht# 4500920</u>		Percent Composition	
		Shielding Gas(es) <u>Argon</u>	(Mixture) <u>99.995%</u>
		Trailing <u>None</u>	Flow rate <u>40 CFH</u>
		Backing <u>None</u>	

FILLER METALS (QW-404)		GTAW	ELECTRICAL CHARACTERISTICS (QW-409)	
SFA Specification		<u>5.18</u>	Current	<u>DC</u>
AWS Classification		<u>ER70S-6</u>	Polarity	<u>Straight</u>
Filler metal F-No.		<u>6</u>	Amps	<u>150</u>
Weld Metal Analysis A-No.		<u>1</u>	Volts	<u>21</u>
Size of Filler Metal		<u>3/32"</u>	Tungsten Electrode Size	<u>1/8" EWTh-2</u>
Filler metal product form		<u>Bare (solid) wire</u>	Pulsing Amps	<u>None</u>
Supplemental Filler Metal		<u>N/A</u>	J/in. Qualified (CVN's)	<u>67,500 J/in</u>
Electrode Flux Classification		<u>N/A</u>	Mode of metal transfer	
Flux Type		<u>N/A</u>	GMAW/FCAW	<u>N/A</u>
Flux trade name		<u>None</u>	Other	
Weld Metal Thickness		<u>3/8"</u>		
Consumable inserts		<u>None</u>		
Other	<u>GTAW: Oxford Alloys 3/32" HT# SA02684</u>			
	<u>Meets A1 chemistry</u>			

POSITION (QW-405)	TECHNIQUE (QW-410)
Position of Groove <u>1G</u>	Travel Speed <u>2.8 IPM</u>
Weld Progression (Uphill, Downhill) <u>N/A</u>	String or Weave Bead <u>Weave</u>
Other	Oscillation <u>None</u>
	Multipass or Single Pass (per side) <u>Multipass</u>
	Single or Multiple Electrodes <u>Single</u>
	Other

PREHEAT (QW-406)
Preheat Temp. (min.) <u>60°F (ambient temp.)</u>
Interpass Temp. (max.) <u>400°F</u>
Other

QW-483 (Back)

PQR No. 14-1453

Tensile Test (QW-150)

Specimen No.	Width (in)	Thickness (in)	Area (sq. in)	Ultimate Total Load lb	Ultimate Unit Stress Psi	Type of Failure & Location
1	0.751	0.328	0.246	19,840	80,650	Base-ductile
2	0.746	0.304	0.277	18,230	80,308	Base-ductile

Guided-Bend Tests (QW-160)

Type and Figure No. QW-462.2a	Result
#1 Side bend	Satisfactory
#2 Side bend	Satisfactory
#3 Side bend	Satisfactory
#4 Side bend	Satisfactory

Toughness Tests (QW-170) (N/A)

Specimen No.	Notch Location	Notch Type	Test Temp. °F	Impact Values			Drop Weight	
				Values ft/lb	% Shear	Mils (in.)	Break	No Break
1,2,3	Weld	"V"	-50 *	45,45,10	N/A	N/A	N/A	N/A
1,2,3	HAZ (SA516-60)	"V"	-50 *	57,46,64	N/A	N/A	N/A	N/A
1,2,3	HAZ (SA516-70)	"V"	-50 *	64,54,34	N/A	N/A	N/A	N/A
					N/A	N/A	N/A	N/A
					N/A	N/A	N/A	N/A
					N/A	N/A	N/A	N/A

Specimen Size 10mm X 7mm *(Actual test temperature due to sub-sized specimen was -58°F)

Fillet-Weld Tests (QW-180)

Result- Satisfactory: Yes N/A No N/A Penetration into Parent Metal: Yes N/A No N/A
 Macro- Results N/A

Other Tests

Type of Test BHN: SA-516-70 (141,139,141) , HAZ (156,156,159) Weld (162,153,159) SA-516-60 (132,130,137) HAZ (153,156,159)
 Other N/A

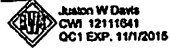
Welders Name Jorge Pando Sr. Clock No. N/A Stamp No. A
 Test conducted by: Sun Materials Testing / Element Laboratory Test No. 14-14534-1/-2

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the Requirements of Section IX of the ASME Code.

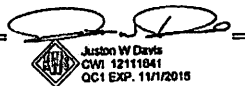
Organization UNITED CONTRACTING SERVICES

Date 11-18-14 By: Tim Morris

Certified by 



QW-482 SUGGESTED FORMAT FOR WELDING PROCEDURE SPECIFICATION (WPS)
 (See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)



Company Name UNITED CONTRACTING SERVICES By: Tim Morris Approved By: _____
 Welding Procedure Specification No. GM-FC-1-1.2 -50 CVN Date 11-9-14 Supporting PQR No.(s) 14-14510
 Revision No. 0 Date N/A
 Welding Process(es) GAS METAL ARC WELDING (GMAW) & FLUX CORED ARC WELDING (FCAW) Type(s) Semi-automatic
 (Automatic,Manual,Machine,Semi-auto)

Joints (QW-402)	Details																																																			
Joint Design <u>Single V or Bevel , Double V or Bevel, Fillet</u>	See page 3 of WPS for joint design details. *1 See shop drawings for optional joint designs used with this WPS.																																																			
Root Spacing <u>3/32" to 3/16"</u>																																																				
Backing (Yes) <u>Optional</u> (No) <u>GMAW- open root</u>																																																				
Backing Material (type) <u>Weld metal or base metal</u> (Refer to both backing and retainers.)																																																				
<input checked="" type="checkbox"/> Metal <input type="checkbox"/> Nonfusing Metal <input type="checkbox"/> Nonmetallic <input type="checkbox"/> Other																																																				
Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.																																																				
(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process, procedures, etc.)																																																				
This WPS may be used in conjunction with other WPS' as indicated on shop drawings. (Ex. Used for repair or root pass.)																																																				
* BASE METALS (QW-403) P-No. <u>1</u> Group No. <u>1 or 2</u> to P-No. <u>1</u> Group No. <u>1 or 2</u> OR Specification type and grade <u>Ex: SA-106-B Normalized</u> To Specification type and grade <u>Ex: SA-516-60/70 Normalized</u> OR Chem. Analysis and Mech. Prop. <u>Base material must be in the normalized condition.</u> To Chem. Analysis and Mech. Prop. _____ Thickness Range: Base Metal: Groove <u>3/8" to 3/4" *</u> Fillet <u>Unlimited</u> Maximum Pass Thickness ≤ 1/2 in. (Yes) <u>X</u> (No) _____ Other <u>*Maximum fill on a 3/4" thk. base metal is 0.6375" due to GMAW short circuiting arc process.</u>																																																				
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%; text-align: left;">* FILLER METALS (QW-404)</th> <th style="width:35%; text-align: center;">FCAW</th> <th style="width:35%; text-align: center;">GMAW</th> </tr> </thead> <tbody> <tr> <td>Spec. No. (SFA)</td> <td style="text-align: center;">5.20</td> <td style="text-align: center;">5.18</td> </tr> <tr> <td>AWS No. (Class)</td> <td style="text-align: center;">E71T-12MJ</td> <td style="text-align: center;">ER70S-6</td> </tr> <tr> <td>F-No.</td> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> </tr> <tr> <td>A-No.</td> <td style="text-align: center;">E71T-12MJ (Kobe DWA-55ESR) *</td> <td style="text-align: center;">ER70S-6 *</td> </tr> <tr> <td>Size of Filler Metals</td> <td style="text-align: center;">.045"</td> <td style="text-align: center;">.035"</td> </tr> <tr> <td>Filler Metal Product Form</td> <td style="text-align: center;">Flux cored wire wire</td> <td style="text-align: center;">Solid (bare) wire</td> </tr> <tr> <td>Supplemental Filler Metal</td> <td style="text-align: center;">None</td> <td style="text-align: center;">None</td> </tr> <tr> <td>Weld Metal</td> <td></td> <td></td> </tr> <tr> <td>Thickness Range:</td> <td></td> <td></td> </tr> <tr> <td> Groove</td> <td style="text-align: center;">1/2" maximum</td> <td style="text-align: center;">0.1375" maximim</td> </tr> <tr> <td> Fillet</td> <td style="text-align: center;">Unlimited</td> <td style="text-align: center;">Unlimited</td> </tr> <tr> <td>Electrode-Flux (Class)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Flux Trade Name</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Consumable Insert</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">N/A</td> </tr> <tr> <td>Other</td> <td style="text-align: center;">Alloy elements: None</td> <td style="text-align: center;">Alloy elements: None</td> </tr> <tr> <td></td> <td style="text-align: center;">*Cert. must meet < 1.60 Mn & < .90 Si for A1</td> <td style="text-align: center;">*Cert. must meet < 1.60 Mn & < .90 Si for A1</td> </tr> </tbody> </table>		* FILLER METALS (QW-404)	FCAW	GMAW	Spec. No. (SFA)	5.20	5.18	AWS No. (Class)	E71T-12MJ	ER70S-6	F-No.	6	6	A-No.	E71T-12MJ (Kobe DWA-55ESR) *	ER70S-6 *	Size of Filler Metals	.045"	.035"	Filler Metal Product Form	Flux cored wire wire	Solid (bare) wire	Supplemental Filler Metal	None	None	Weld Metal			Thickness Range:			Groove	1/2" maximum	0.1375" maximim	Fillet	Unlimited	Unlimited	Electrode-Flux (Class)	N/A	N/A	Flux Trade Name	N/A	N/A	Consumable Insert	N/A	N/A	Other	Alloy elements: None	Alloy elements: None		*Cert. must meet < 1.60 Mn & < .90 Si for A1	*Cert. must meet < 1.60 Mn & < .90 Si for A1
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*Each base metal-filler metal combination should be recorded individually.

POSITIONS (QW-405) Positions(s) of Groove <u> All positions </u> Welding Progression: Up <u> x </u> Down _____ Position(s) of Fillet <u> All positions </u> Other _____	POSTWELD HEAT TREATMENT (QW-407) Temperature Range <u> As Welded Condition </u> Time Range <u> N/A </u> Other _____																				
PREHEAT (QW-406) Preheat Temp. Min. <u> 60° F </u> Interpass Temp. Max. <u> 450° F </u> Preheat Maintenance <u> None after completion of weldment. </u> (Continuous or special heating where applicable should be recorded)	GAS (QW-408) Percent Composition <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;"></td> <td style="width:35%;">Gas(es)</td> <td style="width:35%;">Mixture</td> <td style="width:15%;">Flow rate</td> </tr> <tr> <td>Shielding</td> <td><u> Argon/CO2 </u></td> <td><u> 75/25% </u></td> <td><u> 25-40 CFH </u></td> </tr> <tr> <td>Trailing</td> <td><u> None </u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Backing</td> <td><u> None </u></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>Other</td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </table>		Gas(es)	Mixture	Flow rate	Shielding	<u> Argon/CO2 </u>	<u> 75/25% </u>	<u> 25-40 CFH </u>	Trailing	<u> None </u>	_____	_____	Backing	<u> None </u>	_____	_____	Other	_____	_____	_____
	Gas(es)	Mixture	Flow rate																		
Shielding	<u> Argon/CO2 </u>	<u> 75/25% </u>	<u> 25-40 CFH </u>																		
Trailing	<u> None </u>	_____	_____																		
Backing	<u> None </u>	_____	_____																		
Other	_____	_____	_____																		

ELECTRICAL CHARACTERISTICS (QW-409)

Weld Layer(s)	Process	Filler Metal		Current		Volt Range	IPM Travel Speed Range	Wire Feed Speed Range	Energy or Power Range	(e.g. Remarks)
		Class	Dia.	Type Polar.	Amp Range					Comment Technique
Root Fill & Cap	GMAW FCAW	ER70S-6 E71T-12MJ	.035" .045"	DC/RP DC/RP	70-100 175-190	14-16 23-25	4 - 6 11-14	N/A N/A	*	

Amps and volts, or power or energy range, should be recorded for each electrode size

Pulsing Current None Heat Input Range. GMAW: 24,000 J/in. max. FCAW: 25,909 J/in max.
 Tungsten Electrode size N/A
 Mode of Transfer for GMAW (FCAW) GMAW; Short circuiting arc FCAW: Globular
 Other * Power range is not recorded.

TECHNIQUE (QW-410)

String or Weave Bead GMAW- string or weave bead FCAW- String bead
 Orifice or Gas Cup Size 5/16" or 3/4" I.D.
 Initial and Interpass Cleaning (Brushing, Grinding, etc.) All deleterious materials shall be removed 1" both sides of weld joint by grinding or wire brushing or descaling. Light flash rust after grinding or descaling is acceptable.
 Interpass cleaning with wire brush, grinding or chatter gun.
 Method of Back Gouging NA for single side GMAW welding w/out access to back side of joint. Grinding optional if back side is accessible. FCAW may be used for double sided weld with second side backgouged, ground to bright metal and welded with FCAW.
 Oscillation None
 Contact to Tube Work Distance 1/2" to 1 1/4"
 Multiple or Single Pass (per side) Multiple
 Multiple or Single Electrodes Single
 Electrode Spacing Manual
 Peening None
 Other _____


PROCEDURE SPECIFICATION (WPS) JOINT DESIGNS
(Page 3 of 3)

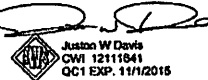
WPS No.: GM-FC-1-1.2 -50CVN Date: 11-9-14 Rev. No.: 0 Date: N/A

JOINTS (QW-402)

Single-V groove: GMAW/FCAW	Single bevel groove: GMAW/FCAW
Backing: <u>No backing</u>	Backing: <u>No backing</u>
Root opening: <u>3/32" – 1/4"</u>	Root opening: <u>3/32" – 1/4"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>1/8" Max</u>	Root face: <u>1/8" Max</u>
Single-V groove: GMAW/FCAW	Single bevel groove: GMAW/FCAW
Backing: <u>Backgouged & welded</u>	Backing: <u>Backgouged & welded</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>1/4" Max.</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>3/16" Max.</u>
Double bevel groove: GMAW/FCAW	Single J groove: GMAW/FCAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" – 3/16"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>
Double V groove: GMAW/FCAW	Single U groove: 3/4" U GMAW/FCAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" – 3/16"</u>
Groove angle: <u>45 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>
Single or double fillet weld: GMAW/FCAW	
Backing: <u>Base metal</u>	
Root opening: <u>3/16" Max.</u>	
Weld size: <u>See drawings</u>	

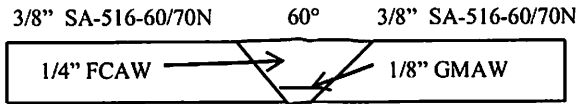
- 1) Alternate weld joint designs may be shown on the drawings or engineering specifications WS 1.00-10 and will take precedence.
- 2) Initial and interpass cleaning is shown on page 2 of the WPS.
- 3) Preheat shall be maintained during all thermal cutting, taking and backgouging operations as shown on the WPS.
- 4) Welds shall be cleaned as required on page 2 of the WPS.

Prepared By: <u>Tim Morris</u>	Approved By: <u></u>	Date: <u>11-9-14</u>
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QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
 (See QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
 Record Actual Conditions Used to Weld Test Coupon.

Company Name UNITED CONTRACTING SERVICES
 Procedure Qualification Record No. 14-14510 Date 11-9-14
 WPS No. GM-FC-1-1.2 -50 CVN
 Welding Processes(es) GAS METAL ARC WELDING (GMAW) & FLUX CORED ARC WELDING (FCAW)
 Types (Manual, Automatic, Semi-auto.) Semi-automatic



Groove Design of Test Coupon

*(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used)

BASE METALS (QW-403)		POSTWELD HEAT TREATMENT (QW-407)	
Material Spec. <u>SA-516 to SA516</u>	Type or Grade <u>Dual certified to Gr.60 & Gr. 70 normalized.</u>	Temperature <u>As welded condition</u>	Time <u>N/A</u>
P No. <u>1</u> Gr. No. <u>1/2</u> to P No <u>1</u> Gr. No <u>1/2</u>	Thickness of Test Coupon <u>3/8"</u>	Other _____	Other _____
Diameter of Test Coupon <u>N/A plate test</u>	Max. pass thk. <u>< 1/2"</u>	GAS (QW-408)	
Other <u>NUCOR SA-516-60/70 HT# 4500920</u>		Percent Composition	
<u>Qualifies T thk. 3/8" - 3/4" with CVN's</u>	<u>Qualifies t thk. GMAW: Sec, IX CVN's 0.1375" max.</u>	Shielding <u>Ar/CO2</u>	Gas(es) <u>Ar/CO2</u>
<u>Qualifies t thk. FCAW: Sec, IX CVN's 1/2" max.</u>		Trailing <u>None</u>	(Mixture) <u>75/55%</u>
		Backing <u>None</u>	Flow rate <u>30 CFH *</u>
			<u>*FCAW</u>
			<u>40 CFH</u>

FILLER METALS (QW-404)		ELECTRICAL CHARACTERISTICS (QW-409)	
SFA Specification <u>5.20</u>	AWS Classification <u>E71T-12MJ</u>	Current <u>GMAW - DC</u>	Polarity <u>GMAW - Reverse</u>
Filler metal F-No. <u>6</u>	Weld Metal Analysis A-No. <u>E71T-12MJ</u>	Amps <u>GMAW- 100</u>	Volts <u>GMAW- 16</u>
Size of Filler Metal <u>.045"</u>	Filler metal product form <u>Flux cored</u>	Tungsten Electrode Size <u>N/A</u>	Pulsing Amps <u>None</u>
Supplemental Filler Metal <u>None</u>	Electrode Flux Classification <u>N/A</u>	J/in. Qualified (CVN's)	GMAW: <u>24,000 J/in</u>
	Flux Type <u>N/A</u>		FCAW: <u>25,909 J/in</u>
	Flux trade name <u>N/A</u>	Mode of metal transfer	GMAW/FCAW <u>GMAW: Short circuiting arc</u>
Weld Metal Thickness <u>1/4"</u>	Consumable inserts <u>N/A</u>	Other <u>FCAW: Globular</u>	
Other <u>GMAW: Exocor" HT# X7910</u>	Other <u>FCAW Kobelco DW-A55ESR HT# AW4569</u>		

POSITION (QW-405)	TECHNIQUE (QW-410)
Position of Groove <u>3G</u>	Travel Speed <u>GMAW- 4 IPM</u>
Weld Progression (Uphill, Downhill) <u>Up-hill</u>	String or Weave Bead <u>GMAW - Weave</u>
Other _____	Oscillation <u>None</u>
	Multipass or Single Pass (per side) <u>Multipass</u>
	Single or Multiple Electrodes <u>Single</u>
	Other _____

PREHEAT (QW-406)
Preheat Temp. (min.) <u>70°F (ambient temp.)</u>
Interpass Temp. (max.) <u>450°F</u>
Other _____

QW-483 (Back)

PQR No. 14-14510

Tensile Test (QW-150)

Specimen No.	Width (in)	Thickness (in)	Area (sq. in)	Ultimate Total Load lb	Ultimate Unit Stress Psi	Type of Failure & Location
1	0.752	0.330	0.248	19,020	76,694	Weld -ductile
2	0.753	0.347	0.261	20,490	78,508	Weld -ductile

Guided-Bend Tests (QW-160)

Type and Figure No. QW-462.2a	Result
#1 Side bend	Satisfactory
#2 Side bend	Satisfactory
#3 Side bend	Satisfactory
#4 Side bend	Satisfactory

Toughness Tests (QW-170) (N/A)

Specimen No.	Notch Location	Notch Type	Test Temp. °F	Impact Values			Drop Weight	
				Values ft/lb	% Shear	Mils (in.)	Break	No Break
1,2,3	Weld 1/16" root surface	"V"	-50	62,61,41	N/A	N/A	N/A	N/A
1,2,3	HAZ	"V"	-50	39,74,61	N/A	N/A	N/A	N/A
					N/A	N/A	N/A	N/A
					N/A	N/A	N/A	N/A
					N/A	N/A	N/A	N/A
					N/A	N/A	N/A	N/A
Specimen Size 10mmX10mm								

Fillet-Weld Tests (QW-180)

Result- Satisfactory: Yes N/A No N/A Penetration into Parent Metal: Yes N/A No N/A
 Macro- Results N/A

Other Tests

Type of Test BHN: Base- 150,179,141 Weld- 150,159,141 HAZ- 169,162,147
 Deposit Analysis N/A
 Other N/A

Welders Name Marco Morenos Clock No. N/A Stamp No. M2
 Test conducted by: Sun Materials Testing / Element Laboratory Test No. 14-14510-1/-2

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the Requirements of Section IX of the ASME Code and NACE standards.

Organization UNITED CONTRACTING SERVICES

Date 11-9-14 By: Tim Morris

Certified by 
 Justin W Davis
 CWI 12111641
 QC1 EXP. 11/1/2015

UCS
Approved
Date 3-9-13

QW-482 SUGGESTED FORMAT FOR WELDING PROCEDURE SPECIFICATION (WPS)
(See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name UNITED CONTRACTING SERVICES INC. By: Tim Morris Approved by: *Robert King*
 Welding Procedure Specification No. 5001-A Date 3-30-09 Supporting PQR No. 5001-A
 Revision No. 3 Date 3-9-13
 Welding Process(es) GAS TUNGSTEN ARC WELDING (GTAW) Type(s) GTAW -manual
 (Automatic, Manual, Machine, Semi-auto)

Joints (QW-402)	Details
Joint Design <u>Single V or Bevel, Double V or Bevel *1</u>	
Backing (Yes) <u>Optional</u> (No) <u>GTAW-open root</u>	
Backing Material (type) <u>Weld or base metal for double side weld</u>	
Retainers: None (Refer to both backing and retainers.)	
<input checked="" type="checkbox"/> Metal <input type="checkbox"/> Nonfusing Metal <input type="checkbox"/> Nonmetallic <input type="checkbox"/> Other	
<p>Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.</p> <p>(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process, procedures, etc.)</p>	<p>Joint Designs page 3 of WPS</p> <p>*1 See shop drawings for optional joint designs used with this WPS. This WPS may be used in conjunction with other WPS' as indicated on shop drawings.</p>

*** BASE METALS (QW-403)**

P-No. 8 Group No. 1 to P-No. 8 Group No. 1

OR

Specification type and grade Example: SA-240 Type 308L / 308 or 316L / 316

To Specification type and grade _____

OR

Chem. Analysis and Mech. Prop. _____

To Chem. Analysis and Mech. Prop. _____

Thickness Range:

Base Metal:	Groove <u>3/16" - 0.864"</u>	Fillet <u>Unlimited</u>
Pipe Dia. Range:	Groove <u>All Diameters</u>	Fillet <u>All Diameters</u>

Other _____

* FILLER METALS (QW-404)	GTAW	
Spec. No. (SFA) _____	5.9	
AWS No. (Class) _____	ER308L, ER309L, ER316L *	
F-No. _____	6	
A-No. _____	8	
Size of Filler Metals _____	1/16", 3/32", 1/8"	
Weld Metal		
Thickness Range:		
Groove _____	0.864" maximum deposit	
Fillet _____	Unlimited	*ER308L with 304 or 304L base metals
Electrode-Flux (Class) _____	N/A	*ER316L with 316 or 316L base metal
Flux Trade Name _____	N/A	*ER309L with 310 to 304 or 304L base metals
Consumable Insert _____	None	
Other _____	Solid (bare) wire	
	Addition of flux: None	

*Each base metal-filler metal combination should be recorded individually.

<p>POSITIONS (QW-405) Positions(s) of Groove <u>All positions</u> Welding Progression: Up <u>Yes</u> Down _____ Position(s) of Fillet <u>All positions</u></p> <p>PREHEAT (QW-406) Preheat Temp. Min. <u>50° F</u> Interpass Temp. Max. <u>350°F</u> Preheat Maintenance <u>None</u> (Continuous or special heating where applicable should be recorded)</p>	<p>POSTWELD HEAT TREATMENT (QW-407) Temperature Range <u>As Welded</u> Time Range <u>N/A</u></p> <p>GAS (QW-408)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Gas(es)</th> <th>Percent Composition Mixture</th> <th>Flow rate</th> </tr> </thead> <tbody> <tr> <td>GTAW</td> <td><u>Argon</u></td> <td><u>99.995%</u></td> <td><u>20-40 CFH</u></td> </tr> <tr> <td>Shielding</td> <td><u>Argon</u></td> <td><u>99.995%</u></td> <td><u>20-40 CFH</u></td> </tr> <tr> <td>Trailing</td> <td><u>None</u></td> <td></td> <td></td> </tr> <tr> <td>Backing</td> <td><u>Argon</u></td> <td><u>99.995%</u></td> <td><u>**</u></td> </tr> </tbody> </table>		Gas(es)	Percent Composition Mixture	Flow rate	GTAW	<u>Argon</u>	<u>99.995%</u>	<u>20-40 CFH</u>	Shielding	<u>Argon</u>	<u>99.995%</u>	<u>20-40 CFH</u>	Trailing	<u>None</u>			Backing	<u>Argon</u>	<u>99.995%</u>	<u>**</u>
	Gas(es)	Percent Composition Mixture	Flow rate																		
GTAW	<u>Argon</u>	<u>99.995%</u>	<u>20-40 CFH</u>																		
Shielding	<u>Argon</u>	<u>99.995%</u>	<u>20-40 CFH</u>																		
Trailing	<u>None</u>																				
Backing	<u>Argon</u>	<u>99.995%</u>	<u>**</u>																		

ELECTRICAL CHARACTERISTICS (QW-409)

Current AC or DC Below Polarity Below
 Amps (Range) Below Volts (Range) Below

(Amps and volts range should be recorded for each electrode size, position, and thickness, etc. This information may be listed in a tabular form similar to that shown below.)

Tungsten Electrode Size and Type EWTh-2 3/32" or 1/8"

** Prior to welding, purge with 6 – 8 volume changes of Argon @ 20 – 40 CFH. During welding, continue to purge @ 10-20 CFH to minimize back pressure until weld is completed or a minimum of 1/4" weld is deposited. O2 < .5% in purge area.

(Pure Tungsten, 2% Thoriated, etc.)

Mode of Metal Transfer for GMAW N/A

(Spray arc, short circuiting arc, etc.)

Electrode Wire feed speed range N/A

TECHNIQUE (QW-410)

String or Weave Bead GTAW- string or weave

Orifice or Gas Cup Size GTAW: #4 - #12

Initial and Interpass Cleaning (Brushing, Grinding, etc. All deleterious materials shall be removed 2" both sides of weld joint by grinding or stainless steel wire brushing. Interpass cleaning with wire brush, chipping hammer or pneumatic scaling gun required.

Method of Back Gouging N/A for GTAW single side open root stringer deposit. Back gouge and/or grind second side for double side weld using the GTAW process.

Contact to Tube Work Distance N/A

Multiple or Single Pass (per side) Multiple

Multiple or Single Electrodes Single

Travel Speed (Range) See Below

Peening None

Other Pulsing amps: None

Weld Layer(s)	Process	Filler Metal		Current		Volt Range	Travel Speed Range	Other Max. J/in.
		Class	Dia.	Type Polar.	Amp Range			
Root Hot pass Fill	GTAW	See page 1 for AWS filler designation. Filler must match correct base metal.	1/16", 3/32" 1/8"	DC/SP DC/SP	80-200 120-250	12-25 18-25	Manual Manual	

WELD PROCEDURE SPECIFICATION (WPS) JOINT DESIGNS
(Page 3 of 3)

WPS No.: 5001-A Date: 3-30-09 Rev. No.: 3 Date: 3-9-13

JOINTS (QW-402)

Single-V groove: GTAW	Single bevel groove: GTAW
Backing: <u>No backing</u>	Backing: <u>No backing</u>
Root opening: <u>3/32" - 3/16"</u>	Root opening: <u>3/32" - 3/16"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>1/8" Max</u>	Root face: <u>1/8" Max</u>

Single-V groove: GTAW	Single bevel groove: GTAW
Backing: <u>Backgouged & welded</u>	Backing: <u>Backgouged & welded</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>1/4" Max.</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>3/16" Max.</u>

Double bevel groove: GTAW	Single J groove: 3/8" J GTAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" - 3/16"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>

Double V groove: GTAW	Single U groove: 3/4" U GTAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" - 3/16"</u>
Groove angle: <u>45 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>

Single or double fillet weld: GTAW

Backing: Base metal

Root opening: 3/16" Max.

Weld size: See drawings

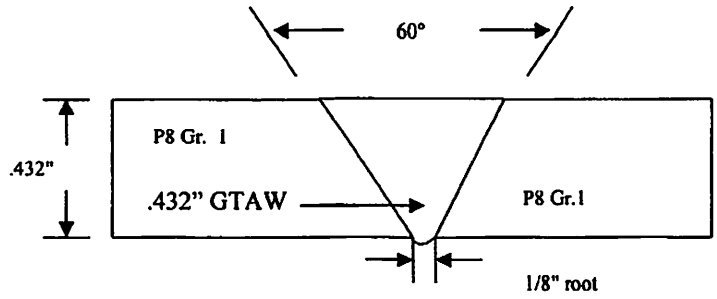
- 1) Alternate weld joint designs may be shown on the drawings or engineering specifications and will take precedence.
- 2) Initial and interpass cleaning is shown on page 2 of the WPS.
- 3) Preheat shall be maintained during all thermal cutting, taking and backgouging operations as shown on the WPS.
- 4) Welds shall be cleaned as required on page 2 of the WPS.

Prepared By: <u>Tim Morris</u>	Approved By: <u><i>Robert Kent</i></u>	Date: <u>3-9-13</u>
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QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
 (See QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
 Record Actual Conditions Used to Weld Test Coupon.

Company Name UNITED CONTRACTING SERVICES INC.
 Procedure Qualification Record No. 5001-A Date 3-30-09
 WPS No. 5001-A
 Welding Processes(es) GAS TUNGSTEN ARC WELDING (GTAW)
 Types (Manual, Automatic, Semi-auto.) Manual - Both processes

JOINTS (QW-402)



Groove Design of Test Coupon

*(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used)

BASE METALS (QW-403) Material Spec. <u>SA-312 to SA-312</u> Type or Grade <u>304 to 304</u> P No. <u>P 8 Gr. 1 to P 8 Gr. 1</u> Thickness of Test Coupon <u>.432"</u> Diameter of Test Coupon <u>6.625"</u> Other <u>Qualifies T thk. 3/16" - 0.864"</u> <u>Qualifies GTAW t thk. 0.864" max.</u> <u>Max. bead thk. < 1/2"</u>		POSTWELD HEAT TREATMENT (QW-407) Temperature <u>As Welded</u> Time <u>N/A</u> Other _____																																										
FILLER METALS (QW-404) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">SFA Specification</td> <td style="width:50%;">GTAW</td> </tr> <tr> <td>AWS Classification</td> <td>5.9</td> </tr> <tr> <td>Filler metal F-No.</td> <td>ER308L</td> </tr> <tr> <td>Weld Metal Analysis A-No.</td> <td>6</td> </tr> <tr> <td>Size of Filler Metal</td> <td>8</td> </tr> <tr> <td>Other</td> <td>1/8"</td> </tr> <tr> <td colspan="2"> _____ Solid bare wire _____ No flux addition </td> </tr> <tr> <td>Weld Metal Thickness</td> <td>0.432"</td> </tr> <tr> <td colspan="2">Consumable inserts- None</td> </tr> </table>		SFA Specification	GTAW	AWS Classification	5.9	Filler metal F-No.	ER308L	Weld Metal Analysis A-No.	6	Size of Filler Metal	8	Other	1/8"	_____ Solid bare wire _____ No flux addition		Weld Metal Thickness	0.432"	Consumable inserts- None		GAS (QW-408) <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2"></th> <th colspan="3">Percent Composition</th> </tr> <tr> <th>Gas(es)</th> <th>(Mixture)</th> <th>Flow rate</th> </tr> </thead> <tbody> <tr> <td>Shielding</td> <td>Argon</td> <td>99.995%</td> <td>40 CFH</td> </tr> <tr> <td>Trailing</td> <td>None</td> <td></td> <td></td> </tr> <tr> <td>Backing</td> <td>Argon</td> <td>99.995%</td> <td>35 CFH</td> </tr> <tr> <td>Other</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			Percent Composition			Gas(es)	(Mixture)	Flow rate	Shielding	Argon	99.995%	40 CFH	Trailing	None			Backing	Argon	99.995%	35 CFH	Other			
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Other																																												
POSITION (QW-405) Position of Groove <u>6G</u> Weld Progression (Uphill, Downhill) <u>Vertical up</u> Other _____		ELECTRICAL CHARACTERISTICS (QW-409) Current <u>GTAW & SMAW: DC</u> Polarity <u>GTAW- Straight</u> Amps <u>GTAW- 110</u> Volts <u>GTAW- 19</u> Tungsten Electrode Size <u>EWTh-2 1/8" dia.</u> Pulsing Amps <u>None</u> J/in. Qualified (CVN's) _____ Other _____																																										
PREHEAT (QW-406) Preheat Temp. (min.) <u>55°F ambient temp.</u> Interpass Temp. (max.) <u>350°F</u> Other _____		TECHNIQUE (QW-410) Travel Speed <u>10 IPM</u> String or Weave Bead <u>GTAW - Slight Weave</u> Oscillation <u>None</u> Multipass or Single Pass (per side) <u>Multipass</u> Single or Multiple Electrodes <u>Single</u> Other _____																																										

QW-482 SUGGESTED FORMAT FOR WELDING PROCEDURE SPECIFICATION (WPS)
 (See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name UNITED CONTRACTING SERVICES INC. By: Tim Morris Approved by: *[Signature]*
 Welding Procedure Specification No. 5002-A Date 3-20-09 Supporting PQR No.(s) 5002-A
 Revision No. 1 Date 9-15-12
 Welding Process(es) GAS METAL ARC WELDING (GMAW) & FLUX CORED ARC WELDING (FCAW) Type(s) Semi-automatic
 (Automatic, Manual, Machine, Semi-auto)

Joints (QW-402) Details

Joint Design Single V or Single Bevel, Fillet *1
 Backing (Yes) FCAW (No) GMAW
 Backing Material (type) Weld metal or base metal Joint Designs page 3 of WPS
 (Refer to both backing and retainers.)

GMAW- Open root stringer
 Metal (FCAW) Nonfusing Metal
 Nonmetallic Other

Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.

(At the option of the Mfr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process, procedures, etc.) *1 See shop drawings for optional joint designs used with this WPS. This WPS may be used in conjunction with other WPS' as indicated on shop drawings.

*** BASE METALS (QW-403)**

P-No. 8 Group No. 1 to P-No. 8 Group No. 1
 OR
 Specification type and grade Example: SA-240 Type 308L / 308 or 316L / 316
 To Specification type and grade _____
 OR
 Chem. Analysis and Mech. Prop. See P-No. above.
 To Chem. Analysis and Mech. Prop. See P-No. above.

Thickness Range:
 Base Metal: Groove 3/16" - 0.864" Fillet Unlimited
 Pipe Dia. Range: Groove 3/4" Min. Fillet Unlimited
 Other _____

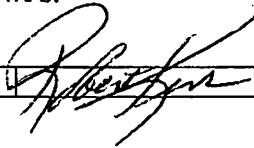
	FCAW	GMAW
* FILLER METALS (QW-404)		
Spec. No. (SFA)	5.22	5.9
AWS No. (Class)	E308LT1-4 or E316LT1-4 *	ER308L or ER316L *
F-No.	6	6
A-No.	8	8
Size of Filler Metals	.045", 1/16"	.035", .045"
Weld Metal	*ER308L with 304 or 304L base metals *ER316L with 316 or 316L base metal	*ER308L with 304 or 304L base metals *ER316L with 316 or 316L base metal
Thickness Range:		
Groove	0.614" max. deposit	0.137" max. deposit
Fillet	Unlimited	Unlimited
Electrode-Flux (Class)	NA	N/A
Flux Trade Name	NA	N/A
Consumable Insert	NA	N/A
Other	Max. passthk. <3/8"	Max pass thk.: 1/8"
	Product form: Flux cored wire Supplemental filler metal: None Alloy elements: None	Product form: Bare wire Supplemental filler metal: None Alloy elements: None

*Each base metal-filler metal combination should be recorded individually.

LIC Approved
 Date 9-17-12

WELD PROCEDURE SPECIFICATION (WPS) JOINT DESIGNS
(Page 3 of 3)

WPS No.: 5002-A Date: 3-20-09 Rev. No.: 1 Date: 9-15-12

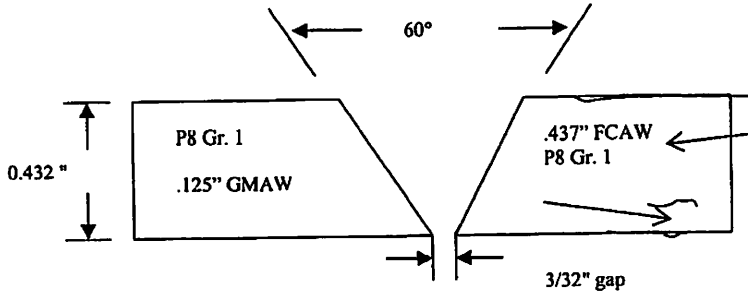
JOINTS (QW-402)			
Single-V groove: GMAW/FCAW Backing: <u>No backing</u> Root opening: <u>3/32" - 3/16"</u> Groove angle: <u>50 deg. Min. included</u> Root face: <u>1/8" Max</u>	Single bevel groove: GMAW/FCAW Backing: <u>No backing</u> Root opening: <u>3/32" - 3/16"</u> Groove angle: <u>45 deg. Min. included</u> Root face: <u>1/8" Max</u>		
Single-V groove: GMAW/FCAW Backing: <u>Backgouged& welded</u> Root opening: <u>1/4" Max.</u> Groove angle: <u>50 deg. Min. included</u> Root face: <u>3/16" Max.</u>	Single bevel groove: GMAW/FCAW Backing: <u>Backgouged& welded</u> Root opening: <u>1/4" Max.</u> Groove angle: <u>45 deg. Min. included</u> Root face: <u>3/16" Max.</u>		
Double bevel groove: GMAW/FCAW Backing: <u>Backgouged& welded</u> Root opening: <u>1/4" Max.</u> Groove angle: <u>50 deg. Min. included</u> Root face: <u>3/16" Max.</u>	Single J groove: 3/8" JGMAW/FCAW Backing: <u>No backing</u> Root opening: <u>3/32" - 3/16"</u> Groove angle: <u>15 deg. Min. included</u> Root face: <u>1/8" Max</u>		
Double V groove: GMAW/FCAW Backing: <u>Backgouged& welded</u> Root opening: <u>1/4" Max.</u> Groove angle: <u>45 deg. Min. included</u> Root face: <u>3/16" Max.</u>	Single U groove: 3/4" UGMAW/FCAW Backing: <u>No backing</u> Root opening: <u>3/32" - 3/16"</u> Groove angle: <u>15 deg. Min. included</u> Root face: <u>1/8" Max</u>		
Single or double fillet weld: GMAW/FCAW Backing: <u>Base metal</u> Root opening: <u>3/16" Max.</u> Weld size: <u>See drawings</u>			
1) Alternate weld joint designs may be shown on the drawings or engineering specifications and will take precedence. 2) Initial and interpass cleaning is shown on page 2 of the WPS. 3) Preheat shall be maintained during all thermal cutting, taking and backgouging operations as shown on the WPS. 4) Welds shall be cleaned as required on page 2 of the WPS.			
Prepared By:	Tim Morris	Approved By:	 Date: <u>9-17-12</u>

UCS Approved
 By: PK
 Date: 9-17-12

QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
 (See QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
 Record Actual Conditions Used to Weld Test Coupon.

Company Name UNITED CONTRACTING SERVICES INC.
 Procedure Qualification Record No. 5002-A Date 3-20-09
 WPS No. 5002-A
 Welding Processes(es) GAS METAL ARC WELDING (GMAW) & FLUX CORED ARC WELDING (FCAW)
 Types (Manual, Automatic, Semi-auto.) Semi-automatic both processes

JOINTS (QW-402)



Groove Design of Test Coupon

*(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used)

BASE METALS (QW-403)

Material Spec. SA-312 to SA-312
 Type or Grade 304 to 304
 P No. P8 Gr.1 to P8 Gr.1
 Thickness of Test Coupon 0.432"
 Diameter of Test Coupon 6.625"
 Other _____
Qualifies T thk. 3/16" - 0.864"
Qualifies t thk. GMAW: Sec. IX 0.137" max.
Qualifies t thk. FCAW: Sec. IX 0.614" max.
Max. pass thk: GMAW-1/8" FCAW- 3/8"

POSTWELD HEAT TREATMENT (QW-407)

Temperature As Welded
 Time _____
 Other _____

GAS (QW-408)

GMAW & FCAW process		Percent Composition	
FCAW	Gas(es)	(Mixture)	Flow rate
Shielding	<u>Ar/CO2</u>	<u>75%/25%</u>	<u>40 CFH</u>
Trailing	<u>None</u>		
Backing	<u>Argon</u>	<u>99.995%</u>	<u>35 CFH</u>
GMAW	<u>Argon</u>	<u>99.995%</u>	<u>30 CFH</u>

FILLER METALS (QW-404)

	GMAW	FCAW
SFA Specification	<u>5.9</u>	<u>5.22</u>
AWS Classification	<u>ER308L</u>	<u>E308LT1-4</u>
Filler metal F-No.	<u>6</u>	<u>6</u>
Weld Metal Analysis A-No.	<u>8</u>	<u>8</u>
Size of Filler Metal	<u>.035"</u>	<u>.045"</u>
Other	<u>Supplemental filler: None</u>	
	<u>FCAW - flux cored wire GMAW-Bare</u>	
Weld Metal Thickness	<u>1/8"</u>	<u>0.307"</u>
Alloy elements:	<u>None</u>	

ELECTRICAL CHARACTERISTICS (QW-409)

Current GMAW - DC FCAW - DC
 Polarity GMAW - Reverse FCAW- Reverse
 Amps GMAW- 80 FCAW- 140
 Volts GMAW- 20 FCAW- 23
 Tungsten Electrode Size N/A
 Pulsing Amps None
 J/in. Qualified (CVN's) _____
 Other Mode of transfer: FCAW- Globular transfer
GMAW- Short Arc

POSITION (QW-405)

Position of Groove 6 G
 Weld Progression (Uphill, Downhill) Uphill
 Other _____

TECHNIQUE (QW-410)

Travel Speed GMAW- 12 IPM FCAW- 12 IPM
 String or Weave Bead GMAW -String FCAW- String
 Oscillation None
 Multipass or Single Pass (per side) Multiple
 Single or Multiple Electrodes Single
 Other _____

PREHEAT (QW-406)

Preheat Temp. (min.) 70°F Ambient temp.
 Interpass Temp. (max.) 550°F
 Other _____

UCS
 QC Approved
 Date 9-17-12

QW-483 (Back)

PQR No. 5002-A

Tensile Test (QW-150)

Specimen No.	Width (in)	Thickness (in)	Area (sq. in)	Ultimate Total Load lb	Ultimate Unit Stress Psi	Type of Failure & Location
Tensile A	0.759	0.411	0.3119	24,335	78,021	Base-ductile
Tensile B	0.752	0.416	0.3128	23,826	76,170	Base-ductile

Guided-Bend Tests (QW-160)

Type and Figure No. QW-462.2a	Result
#1 Top & Bottom Transverse Side Bends	Satisfactory
#2 Top & Bottom Transverse Side Bend	Satisfactory
#3 Top & Bottom Transverse Side Bend	Satisfactory
#4 Top & Bottom Transverse Side Bend	Satisfactory

Toughness Tests (QW-170) Specimen size: 10mm X 10mm

Specimen No.	Notch Location	Notch Type	Test Temp. °F	Impact Values	Lateral Expansion		Drop Weight	
					% Shear	Mils	Break	No Break
		"V"						
		"V"						

Other Tests

Type of Test _____

Welders Name EloyGrajeda Clock No. _____ Stamp No. EG
 Test conducted by: Tulsa Gamma Ray, Inc Laboratory Test No. 102127501

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the Requirements of Section IX of the ASME Code. Updated on new form 9-15-12

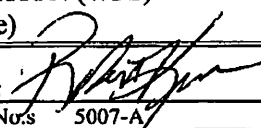
Manufacturer UNITED CONTRACTING SERVICES INC.

Date 3-20-09 By Tim Morris Approved by: 

UCS Approved
 By
 Date 9.12.12

QW-482 SUGGESTED FORMAT FOR WELDING PROCEDURE SPECIFICATION (WPS)

(See QW-200.1, Section IX, ASME Boiler and Pressure Vessel Code)

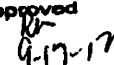
Company Name UNITED CONTRACTING SERVICES INC. By: Tim Morris Approved by: 
 Welding Procedure Specification No. 5007-A Date 3-30-09 Supporting PQR No's 5007-A
 Revision No. 3 Date 9-7-12
 Welding Process(es) GAS TUNGSTEN ARC WELDING (GTAW) Type(s) GTAW -manual
 (Automatic, Manual, Machine, Semi-auto)

Joints (QW-402)	Details
Joint Design <u>Single V or Bevel , Double V or Bevel *1</u>	
Backing (Yes) <u>Optional</u> (No) <u>GTAW-open root</u>	
Backing Material (type) <u>Weld or base metal for double side weld</u>	
Retainers: None (Refer to both backing and retainers.)	
<input checked="" type="checkbox"/> Metal <input type="checkbox"/> Nonfusing Metal <input type="checkbox"/> Nonmetallic <input type="checkbox"/> Other	
Joint Designs page 3 of WPS	
Sketches, Production Drawings, Weld Symbols or Written Description should show the general arrangement of the parts to be welded. Where applicable, the root spacing and the details of weld groove may be specified.	
(At the option of the Mfgr., sketches may be attached to illustrate joint design, weld layers and bead sequence, e.g. for notch toughness procedures, for multiple process, procedures, etc.)	
*1 See shop drawings for optional joint designs used with this WPS. This WPS may be used in conjunction with other WPS' as indicated on shop drawings.	

*** BASE METALS (QW-403)**
 P-No. 8 Group No. 1 to P-No. 8 Group No. 1
 OR
 Specification type and grade Example: SA-240 Type 308L / 308 or 316L /316
 To Specification type and grade _____
 OR
 Chem. Analysis and Mech. Prop. _____
 To Chem. Analysis and Mech. Prop. _____
 Thickness Range:
 Base Metal: Groove 1/16" - 0.294" Fillet Unlimited
 Pipe Dia. Range: Groove All Diameters Fillet All Diameters
 Other _____

	GTAW	
* FILLER METALS (QW-404)		
Spec. No. (SFA) _____	5.9	
AWS No. (Class) _____	ER308L *	ER316L*
F-No. _____	6	
A-No. _____	8	
Size of Filler Metals _____	1/16", 3/32", 1/8"	
Weld Metal		
Thickness Range:		
Groove _____	0.294" maximum deposit	
Fillet _____	Unlimited	
Electrode-Flux (Class) _____	N/A	*ER308L with 304 or 304L base metals
Flux Trade Name _____	N/A	*ER316L with 316 or 316L base metal
Consumable Insert _____	None	
Other _____	Solid wire	
	Addition of flux: None	

*Each base metal-filler metal combination should be recorded individually.

UCS
QC Approved
By 
Date 9-17-12

POSITIONS (QW-405) Positions(s) of Groove <u>All positions</u> Welding Progression: Up <u>Yes</u> Down _____ Position(s) of Fillet <u>All positions</u>	POSTWELD HEAT TREATMENT (QW-407) Temperature Range <u>As Welded</u> Time Range <u>N/A</u>																				
PREHEAT (QW-406) Preheat Temp. Min. <u>50° F</u> Interpass Temp. Max. <u>350°F</u> Preheat Maintenance <u>None</u> (Continuous or special heating where applicable should be recorded)	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">GAS (QW-408)</th> <th colspan="2">Percent Composition</th> </tr> <tr> <th>GTAW</th> <th>Gas(es)</th> <th>Mixture</th> <th>Flow rate</th> </tr> <tr> <td>Shielding</td> <td><u>Argon</u></td> <td><u>99.995%</u></td> <td><u>20-40 CFH</u></td> </tr> <tr> <td>Trailing</td> <td><u>None</u></td> <td></td> <td></td> </tr> <tr> <td>Backing</td> <td><u>Argon</u></td> <td><u>99.995%</u></td> <td><u>**</u></td> </tr> </table>	GAS (QW-408)		Percent Composition		GTAW	Gas(es)	Mixture	Flow rate	Shielding	<u>Argon</u>	<u>99.995%</u>	<u>20-40 CFH</u>	Trailing	<u>None</u>			Backing	<u>Argon</u>	<u>99.995%</u>	<u>**</u>
GAS (QW-408)		Percent Composition																			
GTAW	Gas(es)	Mixture	Flow rate																		
Shielding	<u>Argon</u>	<u>99.995%</u>	<u>20-40 CFH</u>																		
Trailing	<u>None</u>																				
Backing	<u>Argon</u>	<u>99.995%</u>	<u>**</u>																		

ELECTRICAL CHARACTERISTICS (QW-409)

Current AC or DC Below Polarity Below
 Amps (Range) Below Volts (Range) Below

(Amps and volts range should be recorded for each electrode size, position, and thickness, etc. This information may be listed in a tabular form similar to that shown below.)

Tungsten Electrode Size and Type EWTh-2 3/32" or 1/8"

** Prior to welding, purge with 6 – 8 volume changes of Argon @ 20 – 40 CFH. During welding, continue to purge @ 10-20 CFH to minimize back pressure until weld is completed or a minimum of 1/4" weld is deposited. O2 < .5% in purge area.

(Pure Tungsten, 2% Thoriated, etc.)

Mode of Metal Transfer for GMAW N/A

(Spray arc, short circuiting arc, etc.)

Electrode Wire feed speed range N/A

TECHNIQUE (QW-410)

String or Weave Bead GTAW- string or weave

Orifice or Gas Cup Size GTAW: #4 - #12

Initial and Interpass Cleaning (Brushing, Grinding, etc.) All deleterious materials shall be removed 2" both sides of weld joint by grinding or stainless steel wire brushing. Interpass cleaning with wire brush, chipping hammer or pneumatic scaling gun required.

Method of Back Gouging N/A for GTAW single side open root stringer deposit. Back gouge and/or grind second side for double side weld using the GTAW process. Use stainless steel brushes for cleaning.

Contact to Tube Work Distance N/A

Multiple or Single Pass (per side) Multiple

Multiple or Single Electrodes Single

Travel Speed (Range) See Below

Peening None

Other Pulsing amps: None

Weld Layer(s)	Process	Filler Metal		Current		Volt Range	Travel Speed Range	Other Max. J/in.
		Class	Dia.	Type Polar.	Amp Range			
Root	GTAW	ER308L	1/16", 3/32"	DC/SP	80-200	12-25	Manual	
Hot pass			1/8"	DC/SP	120-250	18-25		
Fill								

UCS Approved

Date

6/17/12

WELD PROCEDURE SPECIFICATION (WPS) JOINT DESIGNS
(Page 3 of 3)

WPS No.: 5007-A Date: 3-30-09 Rev. No.: 3 Date: 9-7-12

JOINTS (QW-402)

Single-V groove: GTAW	Single bevel groove: GTAW
Backing: <u>No backing</u>	Backing: <u>No backing</u>
Root opening: <u>3/32" - 3/16"</u>	Root opening: <u>3/32" - 3/16"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>1/8" Max</u>	Root face: <u>1/8" Max</u>

Single-V groove: GTAW	Single bevel groove: GTAW
Backing: <u>Backgouged & welded</u>	Backing: <u>Backgouged & welded</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>1/4" Max.</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>45 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>3/16" Max.</u>

Double bevel groove: GTAW	Single J groove: 3/8" J GTAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" - 3/16"</u>
Groove angle: <u>50 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>

Double V groove: GTAW	Single U groove: 3/4" U GTAW
Backing: <u>Backgouged & welded</u>	Backing: <u>No backing</u>
Root opening: <u>1/4" Max.</u>	Root opening: <u>3/32" - 3/16"</u>
Groove angle: <u>45 deg. Min. included</u>	Groove angle: <u>15 deg. Min. included</u>
Root face: <u>3/16" Max.</u>	Root face: <u>1/8" Max</u>

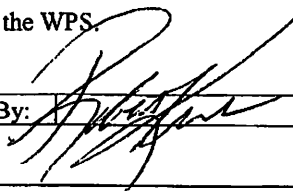
Single or double fillet weld: GTAW


Backing: Base metal

Root opening: 3/16" Max.

Weld size: See drawings

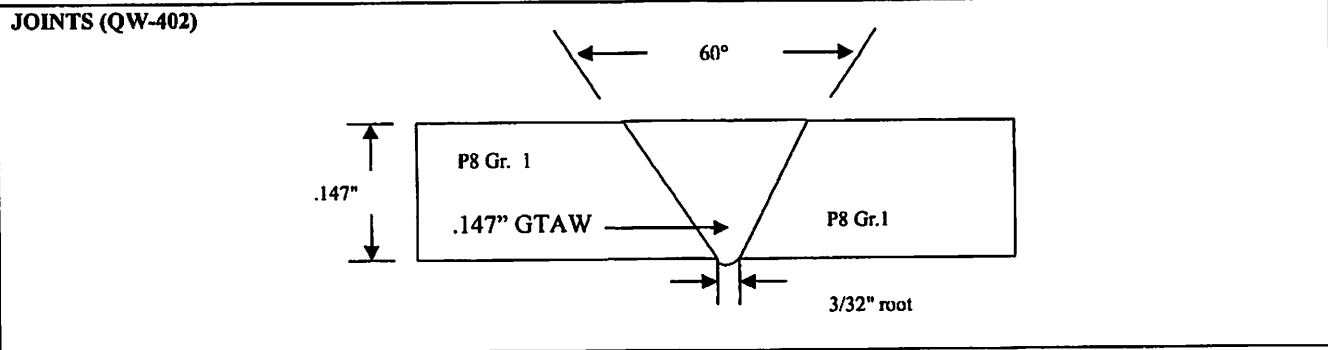
- 1) Alternate weld joint designs may be shown on the drawings or engineering specifications and will take precedence.
- 2) Initial and interpass cleaning is shown on page 2 of the WPS.
- 3) Preheat shall be maintained during all thermal cutting, tacking and backgouging operations as shown on the WPS.
- 4) Welds shall be cleaned as required on page 2 of the WPS.

Prepared By: <u>Tim Morris</u>	Approved By: 	Date: <u>9-17-12</u>
--------------------------------	---	----------------------

UCS
QC Approved
By: 
Date: 9-17-12

QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
 (See QW-200.2, Section IX, ASME Boiler and Pressure Vessel Code)
 Record Actual Conditions Used to Weld Test Coupon.

Company Name UNITED CONTRACTING SERVICES INC.
 Procedure Qualification Record No. 5007-A Date 10-1-10
 WPS No. 5007-A
 Welding Processes(es) GAS TUNGSTEN ARC WELDING (GTAW)
 Types (Manual, Automatic, Semi-auto.) Manual - Both processes



Groove Design of Test Coupon

*(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used)

BASE METALS (QW-403) Material Spec. <u>SA-312 to SA-312</u> Type or Grade <u>304 to 304</u> P No. <u>P 8 Gr. 1 to P 8 Gr. 1</u> Thickness of Test Coupon <u>.147"</u> Diameter of Test Coupon <u>0.840"</u> Other <u>Qualifies T thk. 1/16" - 0.294"</u> <u>Qualifies GTAW t thk. 0.294" max.</u> <u>Max. bead thk. < 1/2"</u>	POSTWELD HEAT TREATMENT (QW-407) Temperature <u>As Welded</u> Time <u>N/A</u> Other _____ GAS (QW-408) <table border="1"> <thead> <tr> <th></th> <th colspan="3">Percent Composition</th> </tr> <tr> <th></th> <th>Gas(es)</th> <th>(Mixture)</th> <th>Flow rate</th> </tr> </thead> <tbody> <tr> <td>Shielding</td> <td><u>Argon</u></td> <td><u>99.995%</u></td> <td><u>30 CFH</u></td> </tr> <tr> <td>Trailing</td> <td><u>None</u></td> <td></td> <td></td> </tr> <tr> <td>Backing</td> <td><u>Argon</u></td> <td><u>99.995%</u></td> <td><u>25 CFH</u></td> </tr> <tr> <td>Other</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Percent Composition				Gas(es)	(Mixture)	Flow rate	Shielding	<u>Argon</u>	<u>99.995%</u>	<u>30 CFH</u>	Trailing	<u>None</u>			Backing	<u>Argon</u>	<u>99.995%</u>	<u>25 CFH</u>	Other			
	Percent Composition																								
	Gas(es)	(Mixture)	Flow rate																						
Shielding	<u>Argon</u>	<u>99.995%</u>	<u>30 CFH</u>																						
Trailing	<u>None</u>																								
Backing	<u>Argon</u>	<u>99.995%</u>	<u>25 CFH</u>																						
Other																									

FILLER METALS (QW-404) SFA Specification _____ AWS Classification _____ Filler metal F-No. _____ Weld Metal Analysis A-No. _____ Size of Filler Metal _____ Other _____ <u>Solid bare wire</u> <u>No flux addition</u> Weld Metal Thickness _____ <u>Consumable inserts- None</u>	GTAW <u>5.9</u> <u>ER308L</u> <u>6</u> <u>8</u> <u>1/8"</u> <u>0.147"</u>	ELECTRICAL CHARACTERISTICS (QW-409) Current <u>GTAW & SMAW: DC</u> Polarity <u>GTAW- Straight</u> Amps <u>GTAW- 112</u> Volts <u>GTAW- 19</u> Tungsten Electrode Size <u>EWTh-2 1/8" dia.</u> Pulsing Amps <u>None</u> J/in. Qualified (CVN's) _____ Other _____
--	--	--

POSITION (QW-405) Position of Groove <u>6G</u> Weld Progression (Uphill, Downhill) <u>Vertical up</u> Other _____ PREHEAT (QW-406) Preheat Temp. (min.) <u>60°F ambient temp.</u> Interpass Temp. (max.) <u>350°F</u> Other _____	TECHNIQUE (QW-410) Travel Speed <u>10 IPM</u> String or Weave Bead <u>GTAW - Slight Weave</u> Oscillation <u>None</u> Multipass or Single Pass (per side) <u>Multipass</u> Single or Multiple Electrodes <u>Single</u> Other _____
--	---

UCS
 QC Approved
 By [Signature]
 Date 9-17-12

QW-483 (Back)

PQR No. 5007-A

Tensile Test (QW-150)

Specimen No.	Width (in)	Thickness (in)	Area (sq. in)	Ultimate Total Load lb	Ultimate Unit Stress Psi	Type of Failure & Location
1	0.834	0.144	0.1214	9,685	79,778	P8 base -ductile
2	0.846	0.145	0.1227	9,523	77,612	P8 base-ductile

Guided-Bend Tests (QW-160)

Type and Figure No.	Result
#1 Side bend per QW-462.2	Satisfactory
#2 Side bend per QW-462.2	Satisfactory
#3 Side bend per QW-462.2	Satisfactory
#4 Side bend per QW-462.2	Satisfactory

Toughness Tests (QW-170)

Specimen No.	Notch Location	Notch Type	Test Temp. °F	Impact Values	Lateral Expansion		Drop Weight	
					% Shear	Mils	Break	No Break
			10mmX10mm specimen					

Fillet-Weld Tests (QW-180)

Result- Satisfactory: Yes _____ No _____ Penetration into Parent Metal: Yes _____ No _____
 Macro- Results _____

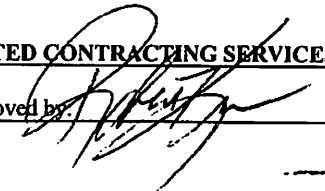
Other Tests

Type of Test _____
 Deposit Analysis _____
 Other _____

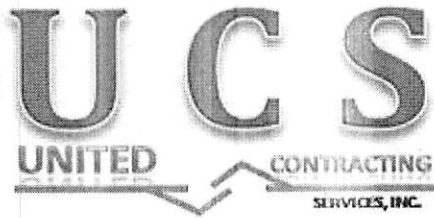
Welders Name Jorge Pando Clock No. _____ Stamp No. M2
 Test conducted by: Tulsa Gamma Ray, Inc Laboratory Test No. 102129134

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the Requirements of Section IX of the ASME Code. Updated on new form 9-7-12

Manufacturer UNITED CONTRACTING SERVICES INC.

Date 10-1-10 By Tim Morris Approved by: 

UCS
QC Approved
By _____
Date 9-17-12



UCS JOB NO. S-4248

Section 6

Welder Qualification Records

JOB: S-4248-03

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name Santos Gutierrez

Identification No. SG

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA-106 Gr. B

Test Coupon Production Weld
Thickness 0.432"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	SEMI-AUTO	SEMI-AUTO
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	6" OD	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71-T	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID/CORED	SOLID/CORED
Deposit thickness for each process	0.432 Total	0.864 MAX
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.0625"	0.187" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.3695"	0.739 MAX
Position qualified (2G, 6G, 3F, etc.)	1G-R	1G, 1F, 1G-R
Vertical progression (uphill or downhill)	FLAT	FLAT
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOBULAR	GLOBULAR
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side (QW-462.2)
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A

Film or Specimens evaluated by Chris Brookhart Company IRIS NDT
 Mechanical tests conducted by Laboratory Tests IRISNDT# 0522
 Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 03FEB2017

Certified by Juston Davis

United Contracting Services INC.

2716 E Apache ST
PH 918.551-7659

Tulsa OK, 74110
FX 918.561-6027

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name SAUL MEDENA

Identification No. SM

TEST DESCRIPTION

Identification of WPS followed 5010-A Test Coupon Production Weld
Specification of base metal(s) SA-106 GR.B Thickness 0.75"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/SAW	GMAW/SAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	14"	
Base metal P or S-Number to P- or S Number	P1	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/EH11K	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID	SOLID
Deposit thickness for each process	-----	-----
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.25"	0.5" MAX
Process 2: <u>SAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.50"	MAX TO BE WELDED
Position qualified (2G, 6G, 3F, etc.)	1G/1G	1G,1G
Vertical progression (uphill or downhill)	-----	-----
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB.	GLOB.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side (QW-462.2)
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A
 Film or Specimens evaluated by KENNITH NIXON Company AMERICAN PIPING INSP.
 Mechanical tests conducted by Laboratory Tests 131006
 Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 03-14-2015

Certified by JUSTON W. DAVIS



Juston W Davis
CWI 12111641
QC1 EXP. 11/1/2015

TULSA GAMMA RAY INC.

1127 South Lewis Ave. Tulsa OK 74104
 PH 918.585.3228 FX 918.584.5598

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ) (See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name Saul Medina

Identification No. SM

TEST DESCRIPTION

Identification of WPS followed 5011A-HT (PQR)
 Specification of base metal(s) SA-516-60/70

Test Coupon Production Weld
 Thickness 0.75"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	SEMI-AUTO	SEMI-AUTO
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input checked="" type="checkbox"/> Plate <input type="checkbox"/> Pipe (enter diameter if pipe or tube)	N/A	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P11 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.20 / 5.18	
Filler metal or electrode classification(s) (info only)	ER70S-6 / E71T-1M	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID/TUBULAR	SOLID/TUBULAR
Deposit thickness for each process	-----	-----
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.125"	0.1625" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.625"	MAX to be Welded
Position qualified (2G, 6G, 3F, etc.)	6G	ALL
Vertical progression (uphill or downhill)	UPHILL	UPHILL
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB.	GLOB.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result
SIDE	ACCEPTABLE	SIDE	ACCEPTABLE		
SIDE	ACCEPTABLE	SIDE	ACCEPTABLE		

Alternative radiographic examination results (QW-191) N/A

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A

Film or Specimens evaluated by JOHN PHILLIPS Company API, Inc.
 Mechanical tests conducted by JOHN PHILLIPS Laboratory Tests M150928-1B
 Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 09/30/2015

Certified by Juston Davis

United Contracting Services INC.

2716 E Apache ST
PH 918.551-7659

Tulsa OK, 74110
FX 918.561-6027

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name SAUL MEDINA

Identification No. SM

TEST DESCRIPTION

Identification of WPS followed 5001-A
Specification of base metal(s) SA312-304

Test Coupon Production Weld
Thickness 0.462"

TESTING CONDITIONS & QUALIFICATIONS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GTAW	GTAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NONE	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	3.5"	2 7/8" & GREATER
Base metal P or S-Number to P- or S Number	P8	P8
Filler metal or electrode specification(s) (SFA) (info only)	5.9	
Filler metal or electrode classification(s) (info only)	ER308L	
Filler metal F-Numbers	6	
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID(BARE)	SOLID(BARE)
Deposit thickness for each process		
Process 1: <u>GTAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.462"	0.864 MAX
Process 2: <u>N.A.</u> 3 layers minimum <input type="checkbox"/> yes <input type="checkbox"/> no	N.A.	N.A.
Position qualified (2G, 6G, 3F, etc.)	6G	ALL
Vertical progression (uphill or downhill)	UPHILL	UPHILL
Type of fuel gas (OFW)	N.A.	N.A.
Inert gas backing (GTAW, PAW, GMAW)	ARGON	ARGON
Transfer mode (spray/globular or pulse to short circuit-GMAW)	N.A.	N.A.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEN	DCEN

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result
FACE	ACCEPTABLE	FACE	ACCEPTABLE		
ROOT	ACCEPTABLE	ROOT	ACCEPTABLE		

Alternative radiographic examination results (QW-191) N/A

Fillet weld - fracture test (QW-180) N/A Length and percent of defects N/A

Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A

Other Tests N/A

Film or Specimens evaluated by John Phillips Company Tulsa Gamma Ray, Inc.

Mechanical tests conducted by John Phillips Laboratory Tests 102129135

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Date 11/10/10

Organization UNITED CONTRACTING SERVICES

By [Signature]

UCS
QC Approved
By [Signature]
Date 11/17/10

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name SAUL MEDINA

Identification No. SM

TEST DESCRIPTION

Identification of WPS followed 5007-A
Specification of base metal(s) SA312-304

Test Coupon Production Weld
Thickness 0.147"

TESTING CONDITIONS & QUALIFICATIONS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GTAW	GTAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NONE	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	0.840"	0.840" & GREATER
Base metal P or S-Number to P- or S Number	P8	P8
Filler metal or electrode specification(s) (SFA) (info only)	5.9	
Filler metal or electrode classification(s) (info only)	ER308L	
Filler metal F-Numbers	6	
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID(BARE)	SOLID(BARE)
Deposit thickness for each process		
Process 1: <u>GTAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.147"	0.294 MAX
Process 2: <u>N.A.</u> 3 layers minimum <input type="checkbox"/> yes <input type="checkbox"/> no	N.A.	N.A.
Position qualified (2G, 6G, 3F, etc.)	6G	ALL
Vertical progression (uphill or downhill)	UPHILL	UPHILL
Type of fuel gas (OFW)	N.A.	N.A.
Inert gas backing (GTAW, PAW, GMAW)	ARGON	ARGON
Transfer mode (spray/globular or pulse to short circuit-GMAW)	N.A.	N.A.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEN	DCEN

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result
FACE	ACCEPTABLE	FACE	ACCEPTABLE		
ROOT	ACCEPTABLE	ROOT	ACCEPTABLE		

Alternative radiographic examination results (QW-191) N/A

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A

Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A

Other Tests N/A

Film or Specimens evaluated by John Phillips Company Tulsa Gamma Ray, Inc.

Mechanical tests conducted by John Phillips Laboratory Tests 102129134

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Organization UNITED CONTRACTING SERVICES

Date 11/10/10

By [Signature]

UCS
QC Approved
By [Signature]
Date 11-7-29-13

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name Saul Media

Identification No. SM

TEST DESCRIPTION

Identification of WPS followed 5006-A Test Coupon Production Weld
Specification of base metal(s) SA106B to SA312 304 Thickness .462

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GTAW	GTAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	3.5"	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1 TO P8	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.9	
Filler metal or electrode classification(s) (info only)	309	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID	SOLID
Deposit thickness for each process	-----	-----
Process 1: <u>GTAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.432"	0.864" MAX
Process 2: _____ 3 layers minimum <input type="checkbox"/> yes <input type="checkbox"/> no	----	----
Position qualified (2G, 6G, 3F, etc.)	6G	ALL POSITIONS
Vertical progression (uphill or downhill)	UPHILL	UPHILL
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	N/A	N/A
GTAW current type/polarity (AC, DCEP, DCEN)	DCEN	DCEN

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side (QW-462.2)
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5(b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result
SIDE	ACCEPTABLE	SIDE	ACCEPTABLE		
SIDE	ACCEPTABLE	SIDE	ACCEPTABLE		

Alternative radiographic examination results (QW-191) N/A

Fillet weld - fracture test (QW-180) N/A Length and percent of defects N/A

Macro examination (QW-184) N/A Fillet size (in.) _____ x _____ Concavity/convexity (in.) N/A

Other Tests N/A

Film or Specimens evaluated by JOHN PHILLIPS Company TULSA GAMMA RAY, Inc.

Mechanical tests conducted by JOHN PHILLIPS Laboratory Tests 1028905

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 7/30/10

Certified by Robert Kirk

UCS
QC Approved
Date 8/17-29-13

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPO)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name LORENZO (CHI) ITZA

Identification No. LC

TEST DESCRIPTION

Identification of WPS followed 5006-A
Specification of base metal(s) SA106B to SA312 304

Test Coupon Production Weld
Thickness 0.300"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GTAW	GTAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	3" OD	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1 TO P8	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.9	
Filler metal or electrode classification(s) (info only)	309L	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID	SOLID
Deposit thickness for each process	-----	----
Process 1: <u>GTAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.300"	0.600" MAX
Process 2: _____ 3 layers minimum <input type="checkbox"/> yes <input type="checkbox"/> no	----	----
Position qualified (2G, 6G, 3F, etc.)	6G	ALL POSITIONS
Vertical progression (uphill or downhill)	UPHILL	UPHILL
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	N/A	N/A
GTAW current type/polarity (AC, DCEP, DCEN)	DCEN	DCEN

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay[QW-462.5(c)] Plate bend specimen, corrosion resistant overlay[QW-462.5(d)]
 Macro test fusion [QW-462.5(b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A

Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A

Other Tests N/A

Film or Specimens evaluated by CHRIS BROOKHART Company IRIS

Mechanical tests conducted by Laboratory Tests 0522

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 2-3-17

Certified by JUSTON DAVIS

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name Matt Little

Identification No. ML

TEST DESCRIPTION

Identification of WPS followed 5007-A
Specification of base metal(s) SA-312 Typ. 304/304L

Test Coupon Production Weld
Thickness 0.154"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GTAW	GTAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	2" OD	1" AND GREATER
Base metal P or S-Number to P- or S Number	P8	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.9	
Filler metal or electrode classification(s) (info only)	ER308L	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID	SOLID
Deposit thickness for each process	-----	-----
Process 1: <u> GMAW </u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.154"	0.308" MAX
Process 2: _____ 3 layers minimum <input type="checkbox"/> yes <input type="checkbox"/> no	N/A	N/A
Position qualified (2G, 6G, 3F, etc.)	6G	ALL POSITIONS
Vertical progression (uphill or downhill)	UPHILL	UPHILL
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	WITH	WITH or WITHOUT
Transfer mode (spray/globular or pulse to short circuit-GMAW)	N/A	N/A
GTAW current type/polarity (AC, DCEP, DCEN)	DCEN	DCEN

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side (QW-462.2)
 Pipe bend specimen, corrosion-resistant overlay[QW-462.5(c)] Plate bend specimen, corrosion resistant overlay[QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A

Macro examination (QW-184) N/A Fillet size (in.) _____ x _____ Concavity/convexity (in.) N/A

Other Tests N/A

Film or Specimens evaluated by Daniel Culver Company IRIS NDT

Mechanical tests conducted by N/A Laboratory Tests IRISNDT# 623

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 10FEB2017

Certified by Juston Davis

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name Matt Little

Identification No. ML

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA-106 Gr. B

Test Coupon Production Weld
Thickness 0.432"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	SEMI-AUTO	SEMI-AUTO
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	6" OD	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P15,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71-T	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID/CORED	SOLID/CORED
Deposit thickness for each process	0.432 Total	0.864 MAX
Process 1: <u> GMAW </u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.0625"	0.187" MAX
Process 2: <u> FCAW </u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.3695"	0.739" MAX
Position qualified (2G, 6G, 3F, etc.)	1G-R	1G, 1F, 1G-R
Vertical progression (uphill or downhill)	N/A	N/A
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB.	GLOB.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side (QW-462.2)
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5(b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A

Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A

Other Tests N/A

Film or Specimens evaluated by Daniel Culver Company IRIS NDT

Mechanical tests conducted by N/A Laboratory Tests IRISNDT# 623

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 10FEB2017

Certified by Juston Davis

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name BOBBY DOWNS

Identification No. BD

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA-106 Gr. B

Test Coupon Production Weld
Thickness 0.432"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	SEMI-AUTO	SEMI-AUTO
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	6" OD	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71-T	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID/CORED	SOLID/CORED
Deposit thickness for each process	0.432 Total	0.864 MAX
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.062"	0.187" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.396"	0.739" MAX
Position qualified (2G, 6G, 3F, etc.)	1G-R	1G, 1F, 1G-R
Vertical progression (uphill or downhill)	N/A	N/A
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB.	GLOB.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5(b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A

Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A

Other Tests N/A

Film or Specimens evaluated by CHRIS BROOKHART Company IRIS

Mechanical tests conducted by N/A Laboratory Tests 0454

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 3-22-2017

Certified by Juston Davis

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name AARON SNATIAGO

Identification No. AS

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA36

Test Coupon Production Weld
Thickness 0.375"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	SEMI-AUTO	SEMI-AUTO
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	5" OD	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71-T	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID/CORED	SOLID/CORED
Deposit thickness for each process	-----	-----
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.062"	0.125" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.313"	0.626" MAX
Position qualified (2G, 6G, 3F, etc.)	2G	1G, 2G
Vertical progression (uphill or downhill)	N/A	N/A
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB.	GLOB.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5(b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A

Film or Specimens evaluated by Jack Henson Company API, INC.
 Mechanical tests conducted by N/A Laboratory Tests 140594
 Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 08/12/2015

Certified by JUSTON DAVIS

United Contracting Services INC.

2716 E Apache ST
PH 918.551-7659

Tulsa OK, 74110
FX 918.561-6027

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name JOSE A. GALVAN

Identification No. JG

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA-106 Gr. B

Test Coupon Production Weld
Thickness 0.5"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	8"	2-7/8" and Greater
Base metal P or S-Number to P- or S Number	P1	P1-P11F & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71-T-1M	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID	SOLID
Deposit thickness for each process	-----	-----
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.062"	0.125" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.438"	Max to be Welded
Position qualified (2G, 6G, 3F, etc.)	3G	1,2,3G
Vertical progression (uphill or downhill)	GM-DOWN/FC-UP	GM-DOWN/FC-UP
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB./SPRAY	GLOB./SPRAY
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5(b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE


Fillet weld - fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A

Film or Specimens evaluated by JACK LLOYD Company AMERICAN PIPING INSP.
 Mechanical tests conducted by Laboratory Tests 149189
 Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 09/25/2014

Certified by JUSTON W. DAVIS 

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name LEONARDO FLORES

Identification No. LF

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA-106 Gr. B

Test Coupon Production Weld
Thickness 0.280"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	6" OD	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1-P11F & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71-T-1M	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID	SOLID
Deposit thickness for each process	-----	-----
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.062"	0.125" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.218"	0.436" MAX
Position qualified (2G, 6G, 3F, etc.)	1GR	1GR
Vertical progression (uphill or downhill)	FLAT	FLAT
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB/GLOB	GLOB/GLOB
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5 (c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A

Film or Specimens evaluated by Chris Brookhart Company IRIS NDT
 Mechanical tests conducted by Laboratory Tests 0454
 Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 30JAN2017

Certified by Juston Davis

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name VINCENTE BUSTOS

Identification No. VB

TEST DESCRIPTION

Identification of WPS followed 5007-A
Specification of base metal(s) SA-312 Typ. 304/304L

Test Coupon Production Weld
Thickness 0.154"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GTAW	GTAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	2" OD	1" AND GREATER
Base metal P or S-Number to P- or S Number	P8	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.9	
Filler metal or electrode classification(s) (info only)	ER308L	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID	SOLID
Deposit thickness for each process	-----	----
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.154"	0.308" MAX
Process 2: _____ 3 layers minimum <input type="checkbox"/> yes <input type="checkbox"/> no	N/A	N/A
Position qualified (2G, 6G, 3F, etc.)	6G	ALL POSITIONS
Vertical progression (uphill or downhill)	UPHILL	UPHILL
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	WITH	WITH or WITHOUT
Transfer mode (spray/globular or pulse to short circuit-GMAW)	N/A	N/A
GTAW current type/polarity (AC, DCEP, DCEN)	DCEN	DCEN

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side (QW-462.2)
 Pipe bend specimen, corrosion-resistant overlay[QW-462.5(c)] Plate bend specimen, corrosion resistant overlay[QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A

Macro examination (QW-184) N/A Fillet size (in.) _____ x _____ Concavity/convexity (in.) N/A

Other Tests N/A

Film or Specimens evaluated by Daniel Culver Company IRIS NDT

Mechanical tests conducted by N/A Laboratory Tests IRISNDT# 623

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 10FEB2017

Certified by Juston Davis

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name VINCENTE BUSTOS

Identification No. VB

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA-106 Gr. B

Test Coupon Production Weld
Thickness 0.432"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	SEMI-AUTO	SEMI-AUTO
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	6" OD	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71-T	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID/CORED	SOLID/CORED
Deposit thickness for each process	0.432 Total	0.864 MAX
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.0625"	0.187" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.3695"	0.739" MAX
Position qualified (2G, 6G, 3F, etc.)	1G-R	1G, 1F, 1G-R
Vertical progression (uphill or downhill)	N/A	N/A
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB.	GLOB.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5 (e)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A

Other Tests N/A

Film or Specimens evaluated by Daniel Culver Company IRIS NDT
 Mechanical tests conducted by N/A Laboratory Tests IRISNDT# 623

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 10FEB2017

Certified by Juston Davis

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name ERNESTO MERCADO

Identification No. EM

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA106B

Test Coupon Production Weld
Thickness 0.280"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	SEMI-AUTO	SEMI-AUTO
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	6"	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71-T	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID/CORED	SOLID/CORED
Deposit thickness for each process	-----	-----
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.125"	0.25" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.375"	0.75" MAX
Position qualified (2G, 6G, 3F, etc.)	6G	ALL POSITIONS
Vertical progression (uphill or downhill)	UPHILL	UPHILL
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB.	GLOB.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A
 Film or Specimens evaluated by JACK HENSON Company API, INC.
 Mechanical tests conducted by N/A Laboratory Tests 140594
 Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 08/12/2015

Certified by JUSTON DAVIS

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPQ)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name ERNESTO MERCADO

Identification No. EM

TEST DESCRIPTION

Identification of WPS followed 5012A
Specification of base metal(s) SA106B

Test Coupon Production Weld
Thickness 0.322"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GTAW	GTAW
Type (i.e.: manual, semi-auto) used	MANUAL	MANUAL
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	8"	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P15F, P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18	
Filler metal or electrode classification(s) (info only)	ER70S6	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID	SOLID
Deposit thickness for each process	-----	----
Process 1: <u>GTAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.322"	0.644" MAX
Process 2: _____ 3 layers minimum <input type="checkbox"/> yes <input type="checkbox"/> no	----	----
Position qualified (2G, 6G, 3F, etc.)	6G	ALL POSITIONS
Vertical progression (uphill or downhill)	UPHILL	UPHILL
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	N/A	N/A
GTAW current type/polarity (AC, DCEP, DCEN)	DCEN	DCEN

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side (QW-462.2)
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5(b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A

Film or Specimens evaluated by JACK LLOYD Company API, INC.
 Mechanical tests conducted by _____ Laboratory Tests 148769
 Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 09/10/2015

Certified by JUSTON DAVIS

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPO)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name Israel Martinez

Identification No. FO

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA-106 Gr. B

Test Coupon Production Weld
Thickness 0.322"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	SEMI-AUTO	SEMI-AUTO
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	8" OD	2 7/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P15F,P34 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.17	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71-T	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID/CORED	SOLID/CORED
Deposit thickness for each process	0.322 Total	0.644 MAX
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.0625"	0.187" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.2605"	0.521" MAX
Position qualified (2G, 6G, 3F, etc.)	1G-R	1G, 1F, 1G-R
Vertical progression (uphill or downhill)	N/A	N/A
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOB.	GLOB.
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

- Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5 (b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld - fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A

Film or Specimens evaluated by Daniel Culver Company IRIS NDT
 Mechanical tests conducted by N/A Laboratory Tests IRISNDT# 623
 Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 10FEB2017

Certified by Juston Davis

UCS
QC Approved
by [Signature]
2/10/17

United Contracting Services INC.

2716 E Apache ST
PH 918.551-7659
Tulsa OK, 74110
FX 918.561-6027

QW-484A SUGGESTED FORMAT A FOR WELDER PERFORMANCE QUALIFICATIONS (WPO)

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name Jorge Pando JR

Identification No. JP

TEST DESCRIPTION

Identification of WPS followed 5011-A
Specification of base metal(s) SA106B

Test Coupon Production Weld
Thickness 0.322"

TESTING VARIABLES & QUALIFICATION LIMITS

Welding Variables (QW-350)	Actual values	Range Qualified
Welding Process(es)	GMAW/FCAW	GMAW/FCAW
Type (i.e.: manual, semi-auto) used	SEMI-AUTO	SEMI-AUTO
Backing (metal, weld metal, double-welded, etc.)	NO BACKING	WITH or WITHOUT
<input type="checkbox"/> Plate <input checked="" type="checkbox"/> Pipe (enter diameter if pipe or tube)	8.625"	2 5/8" AND GREATER
Base metal P or S-Number to P- or S Number	P1	P1 thru P11 & P4X
Filler metal or electrode specification(s) (SFA) (info only)	5.18/5.20	
Filler metal or electrode classification(s) (info only)	ER70S-6/E71T-1M	
Filler metal F-Numbers	F6	F6
Consumable Insert (GTAW or PAW)	NONE	NONE
Filler type (solid/metal or flux cored/powdered) (GTAW or PAW)	SOLID	SOLID
Deposit thickness for each process	-----	-----
Process 1: <u>GMAW</u> 3 layers minimum <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	0.125"	0.250" MAX
Process 2: <u>FCAW</u> 3 layers minimum <input checked="" type="checkbox"/> yes <input type="checkbox"/> no	0.200"	.644" MAX
Position qualified (2G, 6G, 3F, etc.)	6G	ALL
Vertical progression (uphill or downhill)	3G	3G/1G
Type of fuel gas (OFW)	N/A	N/A
Inert gas backing (GTAW, PAW, GMAW)	N/A	N/A
Transfer mode (spray/globular or pulse to short circuit-GMAW)	GLOBULAR	GLOBULAR
GTAW current type/polarity (AC, DCEP, DCEN)	DCEP	DCEP

RESULTS

Visual Examination of Completed Weld (QW-302.4) ACCEPTABLE

Bend Test Transverse Root and Face [QW-462.3(a)] Longitudinal Root and Face [QW-462.3(b)] Side [QW-462.2]
 Pipe bend specimen, corrosion-resistant overlay [QW-462.5(c)] Plate bend specimen, corrosion resistant overlay [QW-462.5(d)]
 Macro test fusion [QW-462.5(b)] Macro test for fusion [QW-462.5(e)]

Type	Result	Type	Result	Type	Result

Alternative radiographic examination results (QW-191) ACCEPTABLE

Fillet weld – fracture test (QW-180) N/A Length and percent of defects N/A
 Macro examination (QW-184) N/A Fillet size (in.) x Concavity/convexity (in.) N/A
 Other Tests N/A

Film or Specimens evaluated by Tyler Warrington Company American piping inspectors, Inc
 Mechanical tests conducted by Laboratory Tests 53834

Welding supervised by UNITED CONTRACTING SERVICES

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer or Contractor UNITED CONTRACTING SERVICES

Date 7/06/12

Certified by Robert Kirk

UCS
QC Approved
By
Date 7/1/14