WELDING PROCEDURE SPECIFICATION

WPS - 3001-1-SC **REV. NO.:** 2 **DATE:** 3/13/2007 ****APPLICABILITY****

WELDING PROCESS: GMAW-SC **and** GMAW-SC **ASME:** X **AWS:** X **OTHER:**

SUPPORTING PQR: Z-WS-10-AO Z-WS-10-AV Z-WS-10-AH Z-WS-10-B Z-WS-10-E

JOINT: This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection etc.

Weld Joint Type:	Butt/Fillet - AWS B-Ua or BU2	**Class:**	Full/Partial Penetration
See GWS 1-06 and WFP's for joint details		**Preparation:**	Thermal/Mechanical
Root Opening:	1/16 - 1/8	**Backing:**	Metal
Backgrind root:	Double sided joints	**Backing Mat.:**	CS when used
Bkgrd Method:	Grind/arc gouge	**GTAW Flux:** N/A	**Backing Retainer:** N/A

FILLER METALS **Class:** ER70S-x **and** ER70S-x

A No: 1 **SFA Class:** 5.18 **an** 5.18 **F No:** 6 **an** 6 **Size:** .035 .035 .035 .035

Insert: N/A **Insert Desc.:** N/A

Flux: Type: N/A **Size:** N/A

Filler Metal Note: Filler wire dia. Limited to .035" only. Wire with "GS"sufix shall not be used.

Weld Metal Thickness Ranges:

AWS Root Pass:	0.065	**thru**	0.187
AWS Balance:	0.065	**thru**	0.750
ASME Root Pass:	0.065	**thru**	0.187
ASME Balance:	0.065	**thru**	0.649

BASE MATERIAL **P/S No.** 1 **Gr No.** All **to: P/S No.** 1 **Gr No.** All

Spec. ≤ .030 C CS- Pipe, plate, sheet & stri **Grade:** All **to: Spec.** ≤ .030 C CS- Pipe, plate, sheet & stri **Grade:** All

Qualified Pipe Dia. Range: ≥ **AWS:** 4 **ASME:** 0.5

Qualified Thickness Range: **AWS:** 0.125 **thru** 0.750 **ASME:** 0.065 **thru** 0.649

QUALIFIED POSITIONS: **AWS:** All **ASME:** All **Vert. Prog.:** ot V/DN Rem. Up

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Preheat Min. Temp.:	70 °F	**GAS: Shielding:**	CO2 **or** N/A
Interpass Max. Temp.:	500 °F	**Gas Composition:**	100 / 0 / 0 % 0 / 0 / 0 %
Preheat Maintenance:	70 °F	**Gas Flow Rate cfh:**	20 **to** 35 0 **to** 0
PWHT: Time @ °F Temp.	0	**Backing Gas/Comp:**	N/A 0 %
Temp. Range:	0 °F	**Backing Gas Flow cfh:**	0 **to** 0
to	0 °F	**Trailing Gas/Comp:**	0 0 %

APPROVAL: Signatures on file at ENG **DATE:** 3/13/2007

WPS NO: 3001-1-SC

WELDING CHARACTERISTICS:

Current: DCEP **and** DCEP **Tungsten Type:** N/A **Transfer Mode:** Short Circuit

Ranges: Amps 115 **to** 200 **Tungsten Dia.:** N/A **Pulsing Cycle:** 0 **to** 0

Volts 18 **to** 26 **Background Current:** 0

Fuel Gas: N/A **Flame:** N/A **Braze temp. °F** 0 **to**

WELDING TECHNIQUE: For fabrication specific requirements such as fittup, cleaning, grinding, PWHT and inspection criteria refer to Volume 2, Welding Fabrication Procedures

Technique: Semiautomatic/Automatic **Cleaning Method:** Wire Brush, File, Grind

Single Pass or Multi Pass: M **Stringer or Weave bead (S/W):** S **or** **Oscillation:** N/A

GMAW Gun Angle °: 5 **to** 15 **Forehand or Backhand for GMAW (F/B):** BH root/FH

No Pass >1/2": True **GMAW/FCAW Tube to work distance:** 3/8 - 1/2

Maximum K/J Heat Input: 0 **Travel speed:** **Gas Cup Size:** 1/2 -5/8

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: N/A **Nil-Ductil Transition Temperature:** N/A **Dynamic Tear:** N/A

Comments: (1) Fillet weld sizes limited to 1/2" with SC process. (2) This WPS is qualified for AWS D9.1 using thicknesses from 18 - 11 gauge for fillets in all positions.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	GMAW-SC	ER70S-x	.035	115 to 130	18 to 22	6 to 12	5 to 15	
2	GMAW-SC	ER70S-x	.035	125 to 200	20 to 26	12 to 20		
3	GMAW-SC	ER70S-x	.035	125 to 200	20 to 26	12 to 20		
4	GMAW-SC	ER70S-x	.035	125 to 200	20 to 26	12 to 20		
5								
6								

REM. * Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.