Los Alamos NATIONAL LABORATORY

WELDING PROCEDURE SPECIFICATION

WPS: 1000-xxxx-11B **REV. NO.:** 1 **DATE:** 12/21/2004 ****APPLICABILITY****

WELDING PROCESS: SMAW **and** SMAW **CODE:** ASME IX **OTHER:**

SUPPORTING PQR: P-WS-188-2 Z-WS-8-F Z-WS-8A-F Z-WS-8-H

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 **Class:** Full & Partial Penetration & Fillets

See GWS 1-06 and WFP's for joint details. **Preparation:** Mechanical/thermal

Root Opening: 1/8 - 1/4 **Backing:** With/without single sided

Backgrind Root: For open root/double sided **Backing Mat.:** Mild steel strap/ring

Bkgrd Method: Grind/chip only **GTAW Flux:** N/A **Backing Retainer:** N/A

FILLER METALS: **Class:** Exxx18-x **and** Exxx18-x

A No: 12 **SFA Class:** 5.5 **and** 5.5 **F No:** 4 **and** 4 **Size:** 3/32 1/8 5/32 3/16

Insert: N/A **Insert Type:** N/A **Weld Metal Thickness Ranges:**

Flux: **Type:** N/A **Size:** N/A **AWS Root Pass:**

Filler Material Note: Restricted to low hydrogen electrodes only. No bead or pass shall be greater than 1/2"in thickness. **AWS Balance:**

ASME Root Pass:

ASME Balance: 0.187 **thru** 8

BASE MATERIAL:

	P No: 11B	**Gr No.:** V	**to P No.:** 11B	**Gr No.:** V	
Spec.: A-517 AS- Plate	**Grade:** Q	**to Spec.:** A-517 AS- Plate		**Grade:** Q	
Qualified Pipe Dia. Range: >=	**AWS:** 0	**ASME:** 2.5			
Qualified Thickness Range:	**AWS:**	**ASME:** 0.187 **thru** 8			

QUALIFIED POSITIONS: **AWS:** 1G, 2G, 3G **ASME:** ASME - All **Vert. Prog.:** V/Up

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Preheat Min. Temp.: 50 **GAS: Shielding:** N/A **or** N/A

Interpass Max. Temp.: 400 **°F** **Gas Composition:** 0 / 0 / 0 % 0 / 0 / %

Preheat Maintenance: 50 **°F** **Gas Flow Rate cfh:** 0 **to** 0 0 **to** 0

PWHT: Time @ °F Temp.: 0 **Backing Gas/Comp:** None 0 **%**

Temperature Range: N/A **°F to** N/A **°F** **Backing Gas Flow cfh:** 0 **to** 0

Trailing Gas/Comp: N/A

WELDING CHARACTERISTICS:

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

Ranges: **Amps:** 70 **Tungsten Dia.:** **Pulsing Cycle:** 0 **to** 0

Volts: 0 **Background Current:** 0

Fuel Gas: N/A **Flame:** N/A **Braze Temp °F:** N/A **to** N/A

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

Technique: Manual **Cleaning Method:** Wire Brush, File, Grind, Chip

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

GMAW Gun Angle: 0 ° **to** 0 ° **Forehand or Backhand for GMAW:** N/A

No Pass > 1/2": **GMAW/FCAW Tube to Work Distance (in):** N/A

Maximum K/J Heat Input: N/A **KJ/in** **Travel Speed:** Variable **Gas Cup Size:** N/A

PROCEDURE QUALIFIED FOR:

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

Comments: 1) When thermal preparation is used (flame cutting or plasma) grinding should be employed to remove approximately 1/16"of weld joint (bevel) surface area. 2) AWS positions are limited to 1G, 2G, and 3G only.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	SMAW	Exxx18-x	3/32	70 **to** 95	0 **to** 0		0 **to** 0	
2	SMAW	Exxx18-x	1/8	125 **to** 160	0 **to** 0			
3	SMAW	Exxx18-x	5/32	140 **to** 205	0 **to** 0			
4	SMAW	Exxx18-x	3/16	170 **to** 240				

REM. * Weld layers are representative only - actual number pf passes and layer sequence may vary.

ML-1/2 projects or jobs must determine if the supporting documentation for this WPS complies with quality requirements of the project/job.

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 the reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.

APPROVAL: Signatures on file at ES-FE **DATE:** 12/21/2004