



WELDING PROCEDURE SPECIFICATION

WPS: 1000-xxxx-1/11B

REV. NO.: 1

DATE: 12/21/2004

APPLICABILITY

WELDING PROCESS: SMAW and SMAW

CODE: ASME IX

OTHER:

SUPPORTING PQR: P-WS-224

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:** Thermal/mechanical**Root Opening:** 1/8 - 3/16**Backing:** With/without single sided**Backgrind Root:** On double sided joints**Backing Mat.:** CS strap/ring when used**Bkgrd Method:** Arc gouge/grind/file**GTAW Flux:** N/A**Backing Retainer:** N/A**FILLER METALS:****Class:** E7018 and E7018**A No:** 1**SFA Class:** 5.1 and 5.1**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:** E-80/90/100 electrodes may be used when necessary. No bead or pass shall be greater than 1/2" in thickness.**AWS Balance:****ASME Root Pass:****ASME Balance:** 0.187 thru 2**BASE MATERIAL:****Spec.:** CS- Plate, pipe, sheet & shapes**P No:** 1
Grade: All**Gr No.:** All
to Spec.: A-517 AS- Plate**to P No.:** 11B**Gr No.:** All
Grade: All**Qualified Pipe Dia. Range:** >=**AWS:** 0**ASME:** 2.5**Qualified Thickness Range:****AWS:****ASME:** 0.187 thru 2**QUALIFIED POSITIONS:****AWS:** AWS 1G, 2G**ASME:** ASME - All**Vert. Prog.:** V/Up**Preheat Min. Temp.:** 200**GAS: Shielding:** N/A or N/A**Interpass Max. Temp.:** 400 °F**Gas Composition:** 0 / 0 / 0 % 0 / 0 / %**Preheat Maintenance:** 350 °F**Gas Flow Rate cfh:** 0 to 0 0 to 0**PWHT: Time @ °F Temp.:** 0**Backing Gas/Comp:** N/A 0 %**Temperature Range:** N/A °F to N/A °F**Backing Gas Flow cfh:** 0 to 0**Trailing Gas/Comp:** N/A 0 %**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:****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":** True**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) Preheat range may vary from 200 - 350 °F for the P11B (HSLA) side of joint.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	SMAW	E7018	3/32	70 to 95			0 to 0	
2	SMAW	E7018	1/8	125 to 160				
3	SMAW	E7018	5/32	140 to 205				
4	SMAW	E7018	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: 4/1/2005