WELDING PROCEDURE SPECIFICATION

WPS - 2010/3006-8 **REV. NO.:** 0 **DATE:** 10/5/2004 ****APPLICABILITY****

WELDING PROCESS/ES: GTAW **and** GMAW-SC **ASME:** X **AWS:**

SUPPORTING PQR: P-WS-6-1 P-WS-5-1 P-WS-5-2 **OTHER:**
P-WS-201-1 P-WS-234 Z-WS-1F

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: Groove/fillet **Class:** Full/partial penetration
See GWS 1-06 for joint details **Preparation:** Mechanical/thermal
Root Opening: 1/16"-3/32" **Backing:** Gas
Backgrind root: N/A **Backing Mat.:** N/A
Bkgrd Method: N/A **GTAW Flux:** N/A **Backing Retainer:** N/A

FILLER METALS: **Class:** ER-3xx(x) **and** E-3xx(x)
A No: 8 **SFA Class:** 5.9 **and** 5.9 **F No:** 6 **and** 6 **Size:** .035 .045 3/32 1/8
Insert: EB **Insert Desc.:** "A" Consumable **Weld Metal Thickness Range:**
Flux: Type: N/A **Size:** N/A **AWS:** 0.000 **thru** 0.000
Filler Metal Note: GMA-.035/.045 GTA-3/32" & 1/8" dia. **ASME:** 0.062 **thru** 1.728

BASE MATERIALS: **P No.** 8 **Gr No.** All **to: P No.** 8 **Gr No.** All
Spec. 17-4 PH **Grade:** --- **to: Spec.** 17-4 PH **Grade:** ---
Qualified Pipe Dia Range: **= :** 0.25
Qualified Thickness Range: **AWS:** 0.000 **thru** 0.000 **ASME:** 0.062 **thru** 1.728

QUALIFIED POSITIONS: Groove - all Fillet - all **Vertical Progression:** V-UP

Preheat Min. Temp.: 50 **°F** **GAS: Shielding:** GTA-Argon **or** MA He/A/CC
Interpass Max. Temp.: 350 **°F** **Gas Composition:** 90 **%** 7.5 **%** 2.5 **%**
Preheat Maintinance: 50 **°F** **Gas Flow Rate cfh:** 10 **to** 40
Backing Gas/Comp: Argon 100 **%**
PWHT: Time @ °F Temp. N/A **Backing Gas Flow cfh:** 3 **to** 8
Temp. Range: N/A **°F** **to** N/A **°F** **Trailing Gas/Comp:** N/A **%**

PREPARED BY: KG Fellers **DATE:** 10/5/2004
Signature on file at FWO-DECS

APPROVED BY: Tobin Oruch **DATE:** 10/5/2004
Signature on file at FWO-DECS

Note:For SC/SS/ML-1/ML-2 work, this WPS requires independent review.

WPS NO: 2010/3006-8

WELDING CHARACTERISTICS:

Current: DCEN **and** DCEP **Tungsten type:** EWTH-2 **Transfer Mode:** GMAW-SC

Ranges: Amps 45 **to** 225 **Pulsing Cycle:** N/A **to** N/A

Volts 12 **to** 22 **Background Current:** N/A

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

WELDING TECHNIQUE: **For cleaning, grinding, and inspection criteria refer to Volume 2, Welding Fabrication Procedures**

Technique: GMA Semi-auto. **Cleaning Method:** Grind/wire brush/file

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

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

GMAW/FCAW Tube to work distance: 1/4" - 1/2"

Maximum K/J Heat Input: N/A **Travel speed:** GMAW as reqd. **Gas Cup Size:** 3/8"-1/2"

No single pass shall deposit greater than 1/2" thickness of material.

PROCEDURE QUALIFIED FOR:

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

Comments: (1) Consumable insert size=3/32" - 1/8" dia. (2)**Maximum oscillation (amplitude) = 3X/d of tungsten dia. (3) No single pass or bead shall be greater than 1/2" in thickness. (4) This WPS is not allowed for AWS applications unless authorized by the WPA

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzel Angle	Other
1	GTAW	ER-3xx(x)	.035	45 **to** 135	12 **to** 18	3 **to** 12	5 - 15	
2	GMAW-SC	E-3xx(x)	.045	95 **to** 225	18 **to** 22	--- **to** ---		
3	GMAW-SC	E-3xx(x)	3/32	0 **to** 0	0 **to** 0	--- **to** ---		
4								
5			1/8					
6								
7								
8								

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.