WELDING PROCEDURE SPECIFICATION

WPS: 2010-xxxx-8-F00 **REV. NO.:** 0 **DATE:** 1/28/2015 ****APPLICABILITY****

WELDING PROCESS: GTAW- **CODE:** ASME IX **OTHER:**

SUPPORTING PQR: FCS-4-AR ASME-01

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: Square Butt and Fillet **Class:** Full & Partial Penetration & Fillets

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

Root Opening: N/A **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:** N/A

A No: N/A **SFA Class:** N/A **and** N/A **F No:** N/A **and** N/A **Size:** N/A N/A N/A N/A

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

Flux: **Type:** N/A **Size:** N/A **AWS Root Pass:** 0 **thru** 0

Filler Material Note: No Filler Metal Used **AWS Balance:** 0 **thru** 0

ASME Root Pass: 0.00 **thru** 0.22

ASME Balance: 0.02 **thru** 0.22

BASE MATERIAL:

	P No: 8	**Gr No.:** ALL	**to P No.:** 8	**Gr No.:** ALL
Spec.: SS- Pipe, plate, sheet & shapes	**Grade:**	**to Spec.:** SS- Pipe, plate, sheet & shapes		**Grade:**
Qualified Pipe Dia. Range: >=	**AWS:** 0	**ASME:** 0.125		
Qualified Thickness Range:	**AWS:** 0 **thru** 0	**ASME:** 0.02 **thru** 0.22		

QUALIFIED POSITIONS: **AWS:** N/A **ASME:** All **Vert. Prog.:** Down/Up

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Preheat Min. Temp.:	60	**GAS: Shielding:**	Argon **or**	N/A
Interpass Max. Temp.:	350 **°F**	**Gas Composition:**	100 / / %	N/A / / %
Preheat Maintenance:	N/A **°F**	**Gas Flow Rate cfh:**	10 **to** 25	0 **to** 0
PWHT: Time @ °F Temp.:	N/A	**Backing Gas/Comp:**	Argon	100 **%**
Temperature Range:	N/A **°F to** N/A **°F**	**Backing Gas Flow cfh:**	5 **to** 10	
		Trailing Gas/Comp:	N/A	

WELDING CHARACTERISTICS:

Current:	DC **and** DCEN	**Tungsten Type:**	EWTh-2	**Transfer Mode:**	N/A
Ranges:	**Amps:** 21	**Tungsten Dia.:**	.045 **to** 3/32	**Pulsing Cycle:**	0 **to** 120
	Volts: 7			**Background Current:**	N/A
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:**	SS WOOL / ABRASIVE CLOTH		
Single or Multi Pass:	Single	**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":	N/A	**GMAW/FCAW Tube to Work Distance (in):**	N/A		
Maximum K/J Heat Input:	N/A **KJ/in**	**Travel Speed:**		**Gas Cup Size:**	N/A

PROCEDURE QUALIFIED FOR:

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

Comments: The use of this WPS requires authorization from LANL WPA or Designee and a job specific Welding Technique Sheet. This WPS is autogenous (no filler materials) manual welding of P8 materials.

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	GTAW-	N/A	N/A	21 **to** 50	7 **to** 16	0 **to** 12	0 **to** 0	
2			N/A	45 **to** 150	7 **to** 16	0 **to** 12		
3			N/A					
4			N/A					

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 possession and use of LANL procedures and qualifications.

PREPARED BY: Signature on File — David Bingham **DATE:** 1/29/2015

REVIEWED BY: Signature on File — Richard Bingham **DATE:** 2/2/15

QA REVIEWED BY: Signature on File — Kelly Bingham **DATE:** 1/29/15

APPROVED BY: Signature on File — Tobin Oruch **DATE:** 2/515