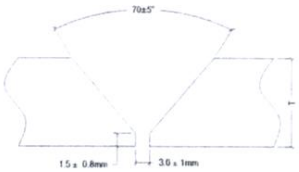
AAIS All Asset Integrity Systems	**WELDING PROCEDURE SPECIFICATION(WPS)** **ES-L-30.2, QP-SPC-R-010-2 & BS 4515-1**	**WPS No.** **AAIS-WPS-PL-3**
Company Name:	**CONTRACT No.**	**Page.1**

Supporting PQR No(s): AMC-PQR-049 REV.-0 & AMC-PQR-050 REV.-0

Welding process(es) : GTAW + SMAW
Type: MANUAL

JOINTS

Joint design:



Root spacing: 3 ± 1mm
Backing: NO for GTAW, Yes for SMAW
Groove: Single V
Fillet: N/A

Backing Material:

Metallic	Non Metallic	Non fusing:	Others:
NA	NA	NA	NA

Retainers: NA
Prep. method: Gas Cutting/Machining/Grinding

BASE MATERIAL

Spec. & type: API 5L X60 / X65 (PIPE) TO API 5L X60 / X65 (PIPE)
P.No.1 Gr.No. 2 TO P.No.1 Gr.No.2
Source of Steel: V & M GERMANY
Supply Condition: HOT FINISH SEAMLESS LINE PIPE

Base metal:	Thickness(mm):	Diameter (mm):
Groove:	12.5mm to 25.0mm	114.3 mm < OD ≤ 323.9 mm
Fillet Joint:	ALL	

DEPOSITED METAL

Groove (MAX): GTAW max. 9.0 mm SMAW max. 19.54 mm
Fillet (MAX): ALL
Overlay thickness qualified mm (min): N/A

FILLER METALS

	Root	Filling
Process:	GTAW	SMAW
Filler type:	SOLID WIRE	COVERED ELECTRODE
Supplier:	OKTIGROD13.12	ESAB OK 48.08
Size mm Ø:	2.4mm	2.5,3.2 &4.0mm
SFA No.:	A5.28	A5.5
AWS No.:	ER80S-G	E7018-G
F No.:	6	4
A No.:	3	1

Flux trade name: N/A
Electrode flux comp.: N/A
Particle size: N/A
Others: N/A
Supplier : N/A
Supplementary filler : N/A
Powder filler : N/A
Addition of cold filler : N/A
Neutral, Active or Alloy flux : N/A

POSITION QUALIFIED

Groove position: ALL
Weld progress : UPHILL
Fillet position: ALL

PREHEAT

Preheat Temp. °C:(Min) Ambient 40 °C
Maintenance: Not required
Method: N/A
Interpass Temp °C:(Max) 186 °C

Temp: Measurement by Digital Termometer and temp. indicating crayons

HEAT TREATMENTS

Type: NA
Temp. °C: NA
H.R. °C/H: NA
C.R. °C/H: NA
Soaking Time: NA

GAS

	Gases	% Composition	Flow rate
Shielding:	Argon	99.997	8-14 L/ Min.
Backing:	N/A	N/A	N/A
Trailing :	N/A	N/A	N/A

ELECTRICAL CHARACTERISTICS

Current: DC POLARITY : See below table
Pulsing: N/A
Amps range: See below table Volts range: See below table
Metal transfer mode for GMAW: N/A
Electrode wire speed range cms/min: N/A

TECHNIQUE

String & weave bead: Root(String) & Weaving(Fill & cap)
Orifice of gas cup size: Ø4,Ø6,Ø8 mm
Initial interpass cleaning: Power Brush / Grinding / Chipping
Method of backgouging: N/A
Oscillation: N/A
Contact tube to work distance: N/A
Number of Welders: One
Multipass or Single: Multipass
Single or Multiple electrode: Single
Electrode spacing: N/A
Welding method: Manual
Closed to out chamber: N/A
Magnetic control device: NA
Overlap: 1.6 mm to 3 mm max.
Peening: N/A
Others: Time lapse between subsequent passes maximum 3-4 minutes

WELDING SEQUENCE

Weld layers	Welding Progression	Process	Filler metal AWS Class	Filler metal Dia. mm	Current Type & Polarity	Current Amps Range	Volt Range	Travel Speed mm/min	Heat Input KJ/mm (Max.)	Remarks
Root	Up Hill	GTAW	ER80S-G	2.4	DCEN	58-138	9-13	57-85	0.83-1.5	
Hot	Up Hill	GTAW	ER80S-G	2.4	DCEN	70-138	9-13	85-97	0.5-1.5	
Filling	Up Hill	SMAW	E7018-G	2.5	DCEP	83-134	21-28	85-170	1.0-2.9	
Filling	Up Hill	SMAW	E7018-G	3.2	DCEP	108-151	21-28	85-170	1.0-2.9	
Caping	Up Hill	SMAW	E7018-G	2.5	DCEP	106-132	21-28	100-210	0.9-1.5	

Prepared By.	**Reviewed /Witnessed By.**	**Approved By.**
AAIS	**VELOSI**	**AAIS**
Date.		