

## PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: 06-12-050-20W5

Date: Jun 16, 2018

SAP Equipment ID: 66181094

VESSEL STATIC DATA						
Plant Galloway		Op Unit Satellite			System Field	
Prov. Insp. # A612508		CRN P7217.231			Equip Tag # NA	
Equipment Description Gas Separator					Serial # 12340	
Manufacturer RJV Gasfield Services					Vessel Class	
Internal Access: Description: NA					Year Built 2011	
MAWP 1480	PSI	@	100	°F	MDMT -20	°F
CODE : U			RT : 2		PWHT : No	
Diameter 16"	Length (T/T) 88 in	OAL 112 in	Vertical			
Shell Mat'l SA-106B	Thickness 21.44	mm	Corr Allowance 1.6	mm		
Head Mat'l SA-516-70	Thickness 20.63	mm	Corr Allowance 1.6	mm		
Nozzle Mat'l NA	Thickness NA	mm / in	Corr Allowance 1.6	mm		
Internal Coating: NO		Internal Clad : NO		Capacity NA m <sup>3</sup>		
Manway : NO		Inspection Port : NO		Skirt		
Nozzle Rating 600	lb ANSI	Painted : YES		Insulated NO		

PROCESS DATA			
Product Description Separator			
Operating Pressure 1480	PSI	Operating Temperature 100	°F

PSV STATIC DATA						
Serial No.	Location	Set Pressure	Capacity SCFM	Manufacturer	Model / Type	Service Date / Company
013664-56	Separator	1440 psi	5180	Taylor	82E8351311	29/09/17/Access

PSV DETAILS			
	Type (Thread/Flange)	ANSI Rating	Size (inches)
PRD Inlet	Threaded	N/A	1"
PRD Outlet	Threaded	N/A	1"

NDE Equipment Records					
Procedure#	Description	Manufacturer	Model#	Serial#	Due Date

### INSPECTION SUMMARY

Inspection noted surface rusting on the lower head. Flaking of the coating was found on the lower side of the inlet nozzle. Several connections were found to be leaking, this includes instrument connections and all sight glass connections. All other items were found acceptable, separator was fit for continued service at time of inspection.

### RECOMMENDATIONS

Coating repairs are recommended to prevent further corrosion. Leaking connections should be addressed to prevent further leakage.

### NONCONFORMANCES / INSPECTION DEFICIENCIES

None noted

### INSPECTION PLANNING

Inspection Strategy _____	Availability _____	Inspection Interval _____
Inspection Date _____	Date of Last Inspect _____	Date of Next Inspect _____

### REPORT CERTIFICATION

The signatures below certify that inspections/tests have been completed in accordance with the identified inspection strategy and that the specified equipment is considered fit for service until the date of next inspection.

Inspected by	Justin Currie		Date	Jun 16, 2018
Company	Streamline Inspection Ltd	PESL #	000885	API # 57452
Reviewed and Approved by	_____	_____	Date	_____
	_____	PESL #	_____	API # _____
Criticality Assessment Rerun	Inspection Planning Rerun			

**PRESSURE VESSEL & COLUMN INSPECTION REPORT**

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Assessed Next Inspection Date
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**PRESSURE VESSEL & COLUMN INSPECTION REPORT**

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**DETAILED INSPECTION VISUAL EXTERNAL**

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)	Acceptable			
V2	General Corrosion	Good	Surface corrosion		
V3	General Leaks	Good	Connection leaks		
V4	Vibration	Acceptable	No vibration		
V5	Dissimilar Flange Rating	N/A			
V6	Ladder/Stairway	N/A			
V7	Heads	Acceptable	Surface rust, lower head		
V8	Guy Wires	N/A			
V9	Electrical Ground	Acceptable	Secured/Indirect		
V10	Painted Inactive Corrosion	N/A			
V11	Coating/Painting	Acceptable			
V12	Expansion Joint or Bellows	N/A			
V13	Gauge/Site Glass	Good	Leaks		
V14	Shell	Acceptable			
V15	Jacket	N/A			
V21	Support Other (Please explain)	N/A			
V22	Foundation	N/A			
V23	Anchor Bolts	N/A			
V24	Saddle/Skirt	Acceptable	Skirt, welded		
V25	Davit	N/A			
V26	Fireproofing	N/A			
V31	Connections Other (Please explain)	Acceptable	Flanged and threaded okay		
V32	Small Branches	Acceptable			
V33	Nozzles	Acceptable			
V34	Manways	N/A			
V35	Reinforcing Pads	N/A			
V36	Inadequate Thread Engagement	Poor	Several leaks		
V37	Bolting	Acceptable			
V38	Flanges	Acceptable			
V39	Leak Clamps	N/A			
V41	Insulation Other (Please explain)	N/A			
V42	Damage	N/A			
V43	Penetrations	N/A			
V44	Insulation Jacket	N/A			
V45	Banding	N/A			
V46	Seals/Joints	Acceptable			
V51	Relief Devices Other (Please explain)	Acceptable	Good condition		
V52	Corrosion	Good	Surface corrosion		
V53	Leaks	Good	Several connections		
V54	Restricted Inlet/Outlet	Acceptable	No restrictions located		
V55	Manual Operation Lever	N/A			

**PRESSURE VESSEL & COLUMN INSPECTION REPORT**

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Date: Jun 16, 2018

SAP Equipment ID: 66181094

**PHOTOS**



06/16/2018

LSD



06/16/2018

VESSEL DATA PLATE



06/16/2018

Overview



06/16/2018

Overview 2



06/16/2018

Leaking instrument connection



06/16/2018

Leaking sight glass connection (TYP)



**PRESSURE VESSEL & COLUMN INSPECTION REPORT**

LSD: 06-12-050-20W5

Date: Jun 16, 2018

SAP Equipment ID: 66181094



Leaking sight glass connection



Surface rusting on lower head and drain



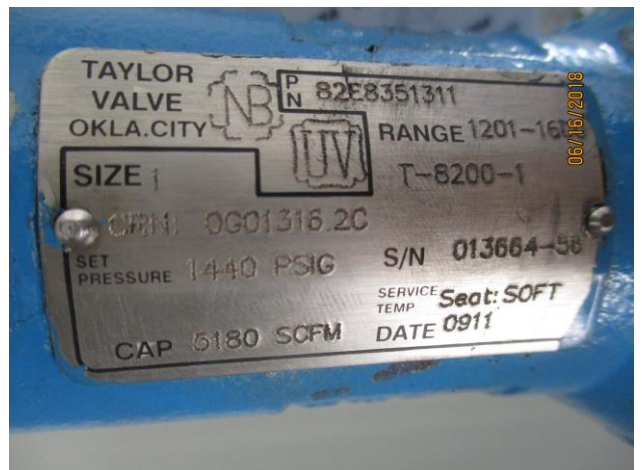
Coating failure on inlet nozzle



Leak noted on instrument connection



PSV Overview



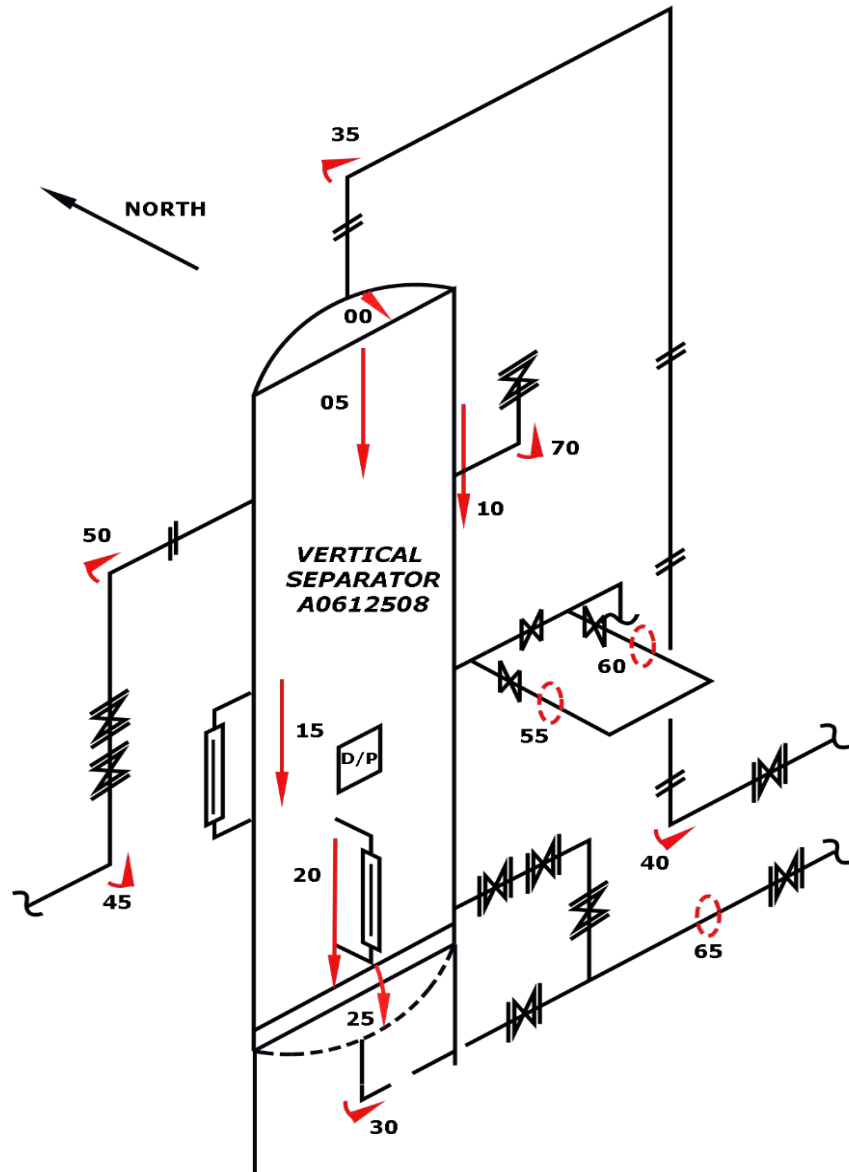
PSV Data Plate



<b>Location Name:</b>	MINEHEAD	<b>LSD:</b>	10-12-50-20W5 (SURF)/06-12-50-20W5 (DH)
<b>Jur #:</b>	A0612508	<b>Equipment/Tag No.</b>	
<b>Equipment Description:</b>	VERTICAL SEPARATOR		
<b>Manufacturer:</b>	RJV GASFIELD SERVICES LTD.		
<b>Serial Number:</b>	12340	<b>CRN:</b>	P7217.231
<b>Shell MAWP:</b>	10205	<b>KPA Shell Design Temp:</b>	38 °C
<b>Tube MAWP:</b>		<b>KPA Tube Design Temp:</b>	°C
<b>Shell Material:</b>	SA-106-B	<b>Head Material:</b>	SA-516-70
<b>Shell Thickness:</b>	21.44	<b>mm Head Thickness:</b>	20.63 mm
<b>Corrosion Allowance:</b>	1.6	<b>mm Date Built:</b>	2011
<b>Size:</b>	406	<b>mm Pipe / Rolled Plate:</b>	PIPE
<b>RT:</b>	2	<b>Streamline Report #:</b>	STL-18-xxx-DMS 17

**NOTES:** SAP# 66181094











# Ultrasonic Corrosion Survey

\*All values are in millimeters unless otherwise stated.

Survey Name: Husky Energy

Date: Jun 16, 2018

Streamline Report #: STL-18-xxx-DMS 17

Inspector: E. Legare

10-12-50-20W5 (SURF)/06-									
<b>LSD:</b>	12-50-20W5 (DH)	<b>Area:</b>	MINEHEAD	<b>Location:</b>	FIELD				
<b>Jur #:</b>	A0612508	<b>Tag Number:</b>		<b>Vessel Name:</b>	VERTICAL SEPARATOR				
<b>CRN:</b>	P7217.231	<b>Year Built:</b>	2011	<b>Serial Number:</b>	12340				
<b>RT:</b>	2	<b>Vessel CA:</b>	1.600 mm	<b>Manufacturer:</b>	RJV GASFIELD SERVICES LTD.				
		<b>Shell MAWP:</b>	10205 KPA	<b>MAWT:</b>	38 °C	<b>Tube MAWP:</b>		<b>MAWT:</b>	
									<b>Pipe/Plate</b>
									<b>PIPE</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b>		<b>Material:</b>	SA-516-70	
<b>00</b>	HEAD	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	Ellipsoidal	<b>Min</b>	21.18	19.030	1.600	20.630		0.000	0.000
<b>OD:</b>	406.4	<b>Avg</b>	21.46						
<b>Spec:</b>	ASME VIII Div.1	<b>Comments:</b>						<b>Remaining Life:</b>	<b>Retirement Date:</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b>		<b>Material:</b>	SA-106-B	
<b>05</b>	SHELL	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	Cylindrical	<b>Min</b>	21.97	19.840	1.600	21.440		0.000	0.000
<b>OD:</b>	406.4	<b>Avg</b>	22.05						
<b>Spec:</b>	ASME VIII Div.1	<b>Comments:</b>						<b>Remaining Life:</b>	<b>Retirement Date:</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b>		<b>Material:</b>	SA-106-B	
<b>10</b>	SHELL	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	Cylindrical	<b>Min</b>	22.43	19.840	1.600	21.440		0.000	0.000
<b>OD:</b>	406.4	<b>Avg</b>	22.71						
<b>Spec:</b>	ASME VIII Div.1	<b>Comments:</b>						<b>Remaining Life:</b>	<b>Retirement Date:</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b>		<b>Material:</b>	SA-106-B	
<b>15</b>	SHELL	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	Cylindrical	<b>Min</b>	21.84	19.840	1.600	21.440		0.000	0.000
<b>OD:</b>	406.4	<b>Avg</b>	22.10						
<b>Spec:</b>	ASME VIII Div.1	<b>Comments:</b>						<b>Remaining Life:</b>	<b>Retirement Date:</b>



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Streamline Report #: STL-18-xxx-DMS 17

Inspector: E. Legare

10-12-50-20W5 (SURF)/06-									
<b>LSD:</b>	12-50-20W5 (DH)	<b>Area:</b>	MINEHEAD	<b>Location:</b>	FIELD				
<b>Jur #:</b>	A0612508	<b>Tag Number:</b>		<b>Vessel Name:</b>	VERTICAL SEPARATOR				
<b>CRN:</b>	P7217.231	<b>Year Built:</b>	2011	<b>Serial Number:</b>	12340				
<b>RT:</b>	2	<b>Vessel CA:</b>	1.600 mm	<b>Manufacturer:</b>	RJV GASFIELD SERVICES LTD.				
		<b>Shell MAWP:</b>	10205 KPA	<b>MAWT:</b>	38 °C	<b>Tube MAWP:</b>		<b>MAWT:</b>	
									<b>Pipe/Plate</b>
									PIPE

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b>		<b>Material:</b>	SA-106-B	
<b>20 SHELL</b>		<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	Cylindrical	<b>Min</b>	21.54	19.840	1.600	21.440		0.000	0.000
<b>OD:</b>	406.4	<b>Avg</b>	21.84						
<b>Spec:</b>	ASME VIII Div.1	<b>Comments:</b>						<b>Remaining Life:</b>	<b>Retirement Date:</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b>		<b>Material:</b>	SA-516-70	
<b>25 HEAD</b>		<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	Ellipsoidal	<b>Min</b>	21.39	19.030	1.600	20.630		0.000	0.000
<b>OD:</b>	406.4	<b>Avg</b>	21.54						
<b>Spec:</b>	ASME VIII Div.1	<b>Comments:</b>						<b>Remaining Life:</b>	<b>Retirement Date:</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b>	Unknown	<b>Material:</b>	SA-234-WPB	
<b>30 NOZZLE</b>		<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	90° Elbow	<b>Min</b>	10.77	9.474	1.600	11.074		0.000	0.044
<b>OD:</b>	60.325	<b>Avg</b>	11.15						
<b>Spec:</b>	ASME VIII Div.1	<b>Comments:</b>						<b>Remaining Life:</b>	<b>Retirement Date:</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b>	Unknown	<b>Material:</b>	SA-234-WPB	
<b>35 PIPING</b>		<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	90° Elbow	<b>Min</b>	5.08	4.845	0.692	5.537		0.000	0.065
<b>OD:</b>	60.325	<b>Avg</b>	5.21						
<b>Spec:</b>	ASME B31.3	<b>Comments:</b>						<b>Remaining Life:</b>	<b>Retirement Date:</b>



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Inspector: E. Legare

10-12-50-20W5 (SURF)/06-									
<b>LSD:</b>	12-50-20W5 (DH)	<b>Area:</b>	MINEHEAD	<b>Location:</b>	FIELD				
<b>Jur #:</b>	A0612508	<b>Tag Number:</b>		<b>Vessel Name:</b>	VERTICAL SEPARATOR				
<b>CRN:</b>	P7217.231	<b>Year Built:</b>	2011	<b>Serial Number:</b>	12340				
<b>RT:</b>	2	<b>Vessel CA:</b>	1.600 mm	<b>Manufacturer:</b>	RJV GASFIELD SERVICES LTD.				
		<b>Shell MAWP:</b>	10205 KPA	<b>MAWT:</b>	38 °C	<b>Tube MAWP:</b>		<b>MAWT:</b>	
									<b>Pipe/Plate</b>
									<b>PIPE</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b> Unknown	<b>Material:</b> SA-234-WPB			
<b>40</b>	PIPING	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	90° Elbow	<b>Min</b>	5.31	4.845	0.692	5.537		0.000	0.033
<b>OD:</b>	60.325	<b>Avg</b>	5.64						
<b>Spec:</b>	ASME B31.3	<b>Comments:</b>						<b>Remaining Life:</b>	<b>Retirement Date:</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b> 600	<b>Material:</b> SA-234-WPB			
<b>45</b>	PIPING	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	90° Elbow	<b>Min</b>	8.20	7.623	1.089	8.712		0.000	0.073
<b>OD:</b>	60.325	<b>Avg</b>	8.46						
<b>Spec:</b>	ASME B31.3	<b>Comments:</b>	LIMITED ACCESS.					<b>Remaining Life:</b>	<b>Retirement Date:</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b> 600	<b>Material:</b> SA-234-WPB			
<b>50</b>	PIPING	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	90° Elbow	<b>Min</b>	5.28	4.845	0.692	5.537		0.000	0.036
<b>OD:</b>	60.325	<b>Avg</b>	5.38						
<b>Spec:</b>	ASME B31.3	<b>Comments:</b>	LIMITED ACCESS.					<b>Remaining Life:</b>	<b>Retirement Date:</b>

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b> Unknown	<b>Material:</b> SA-106-B			
<b>55</b>	PIPING	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	360° Circ	<b>Min</b>	6.20	5.556	0.794	6.350		0.000	0.022
<b>OD:</b>	33.401	<b>Avg</b>	6.32						
<b>Spec:</b>	ASME B31.3	<b>Comments:</b>	ASSUMED NOMINAL					<b>Remaining Life:</b>	<b>Retirement Date:</b>



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10-12-50-20W5 (SURF)/06-									
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<b>Jur #:</b>	A0612508	<b>Tag Number:</b>		<b>Vessel Name:</b>	VERTICAL SEPARATOR				
<b>CRN:</b>	P7217.231	<b>Year Built:</b>	2011	<b>Serial Number:</b>	12340				
<b>RT:</b>	2	<b>Vessel CA:</b>	1.600 mm	<b>Manufacturer:</b>	RJV GASFIELD SERVICES LTD.				
		<b>Shell MAWP:</b>	10205 KPA	<b>MAWT:</b>	38 °C	<b>Tube MAWP:</b>		<b>MAWT:</b>	
									<b>Pipe/Plate</b>
									PIPE

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b> Unknown	<b>Material:</b> SA-106-B			
<b>60</b>	PIPING	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	360° Circ	<b>Min</b>	6.12	5.556	0.794	6.350		0.000	0.033
<b>OD:</b>	33.401	<b>Avg</b>	6.45					<b>Remaining Life:</b>	
<b>Spec:</b>	ASME B31.3	<b>Comments:</b>	ASSUMED NOMINAL					<b>Retirement Date:</b>	

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b> Unknown	<b>Material:</b> SA-106-B			
<b>65</b>	PIPING	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	360° Circ	<b>Min</b>	6.17	5.556	0.794	6.350		0.000	0.025
<b>OD:</b>	33.401	<b>Avg</b>	6.45					<b>Remaining Life:</b>	
<b>Spec:</b>	ASME B31.3	<b>Comments:</b>	ASSUMED NOMINAL					<b>Retirement Date:</b>	

<b>CML Description</b>		Baseline			<b>Flange ANSI:</b> 600	<b>Material:</b> SA-234-WPB			
<b>70</b>	NOZZLE	<b>2018</b>		<b>Flag</b>	<b>CA</b>	<b>Nominal</b>	<b>T Min</b>	<b>STCR mm/yr</b>	<b>LTCR mm/yr</b>
<b>Shape:</b>	90° Elbow	<b>Min</b>	10.69	9.474	1.600	11.074		0.000	0.054
<b>OD:</b>	60.325	<b>Avg</b>	11.10					<b>Remaining Life:</b>	
<b>Spec:</b>	ASME VIII Div.1	<b>Comments:</b>						<b>Retirement Date:</b>	