



<b>Client</b>	Murphy Oil Company Ltd.	<b>Inspection Date</b>	Nov 13, 2017		
<b>Prov. Reg. #</b>	AB 0614452	<b>Inspection Type</b>	VE / UT / PSV		
<b>Equipment Type</b>	Separator	<b>Location</b>	Kaybob - West		
<b>Tag/Equip.</b>	V-100	<b>LSD</b>	AB 14-34-062-19W5		
<b>Status</b>	Not In Service	<b>Downhole LSD</b>			
<b>Manufacturer</b>	Penfabco Ltd.	<b>Area</b>	FOX CREEK		
<b>Serial Number</b>	PE-12760	<b>Year Built</b>	2013		
<b>CRN #</b>	V7852.213	<b>Service</b>	Sour		
<b>Comp/Unit Id</b>		<b>Manway</b>	None		
<b>Nat.Board #</b>		<b>Coating</b>	No		
<b>Interim Insp'n</b>		<b>Interim Type</b>			
<b>Next Thorough Insp</b>		<b>Next Insp Type</b>	VE / UT / PSV		
<b>Length</b>		<b>Height</b>	144 in		
<b>Volume</b>	Capacity	<b>Client Reference</b>			
<b>Owner</b>	Murphy Oil Company Ltd.	<b>RT</b>	1	<b>HT</b>	YES
<b>Foreman</b>		<b>RAE Job No.</b>	0010.17.004.014		
<b>ABSA</b>	<b>Plant:</b> H <b>Vessel:</b> P <b>Process:</b> W <b>Special:</b> S	<b>ASME</b>	Sec. VIII div. 1		
<b>History Log</b>	<p>Data dump from Murphy Equipment Inventory. Next inspection date to be determined by the CI.          AB-10 - In Service - internal entry Dec2017          PSV Data verified as per the Engineered stamped P&amp;ID drawing          Calculated capacity 4191SCFM (gas) @ Set Pressure 9928 kPag with an G-orifice.          AB-10 - Vessel Relocated. Internal entry 2020-03-12          MDR - U1A - 0614452</p> <p>Vessel listed 'Not in Service' on 2021 AB Vessel in Service list updated by Daniel Mora and CI on June 17, 2021          AB-10 - Not in Service - internal entry June 29, 2021</p>				

<b>Component</b>	Shell of Vessel
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<b>MAWP</b>	1439.9 PSI @ 130 °F	<b>MDMT</b>	-20 °F @ 1440.0 PSI
<b>Material</b>		<b>Material Thickness</b>	
<b>Diameter</b>	36 in	<b>Length</b>	
<b>Corrosion Allowance</b>	0.125 in		

<b>Valve Tag No</b>	PSV-104	<b>Relief Type</b>	Pressure Safety Valve
<b>Manufacturer</b>	Mercer	<b>Set Pressure</b>	1439.9 PSI
<b>Serial Number</b>	887611	<b>Capacity</b>	11315 SCFM
<b>Model</b>	91-43G51P27N1	<b>Last Service</b>	Mar 16, 2016
<b>CRN</b>	0G8841.5C	<b>Next Service</b>	2020
<b>Service Co.</b>	Rocky Mountain Valve	<b>Service Interval</b>	48 Months
<b>Service Co. Tag</b>	17759F	<b>Inlet Size</b>	2 in
<b>ASME Stamp</b>	UV	<b>Outlet Size</b>	2 in
<b>NB Stamp</b>	YES	<b>Connection</b>	Threaded
<b>Relief Dest.</b>	To Flare	<b>Valve Loc.</b>	On Piping
<b>Comments</b>		<b>Client Reference</b>	

<b>Component</b>	Heads of Vessel		
<b>Material</b>		<b>Material Thickness</b>	
<b>Corrosion Allowance</b>	0.125 in		



**Comments**

The following RAE Procedure(s) was/were used in inspecting this vessel:

INS-645B PRV Inspection Procedure

INS-670B Separator Inspection Procedure

NDE-701B UT-1 Ultrasonic Thickness Measurement Procedure

Figure: 1



Site LSD Sign



**Building Observations**

Access # of Doors:1 Gas test port: No  
Catalytic Heater: Yes Fire eye: No Gas Detection: Yes  
Drainage/Condition: Acceptable Lighting: Good  
Supports : Skid  
Floors : Checker plate steel  
Equipment placed ergonomically: Yes

The building was generally in good condition and well supported.  
The building had adequate lighting for visual inspection.  
The doors and windows functioned well and were in good condition.  
There was generally good access to the equipment in the building.  
The ground wire was securely attached to the building structure.  
The building was situated on a transportation skid that was supported by the ground.

Figure: 2



Building General



**Piping Observations**

Are Mechanical connections acceptable for service? Acceptable

Clad: Yes Painted: Yes Insulated: Yes

Condition: Acceptable

Type: U-Bolt

Are there any dead legs: No

Piping supported adequately: Yes

The attached piping was generally in good condition.

The piping was sufficiently supported.

There was no damage, distortion or stress evident on the piping.

The piping outside the building was insulated and the cladding appears to be in good condition.

The piping inside the building was painted the paint appears to be in good condition.

The pipe flanges and bolting appeared to be in good condition.

Figure: 3



Piping General



**PSV Observations**

- Drainage : Acceptable
- Supports : Acceptable
- Bolting : Acceptable
- Gasket : Acceptable
- Seal wire : Acceptable
- Service tag : Acceptable
- CRN : Acceptable
- Set pressure : Acceptable
- Installations vertical : Yes
- Required Capacity : Value not available
- PSV block valves : No
- PSV service report available : Yes

The PSV was located on associated piping.  
 The nameplate was securely attached and legible.  
 The set pressure was acceptable for the vessel.  
 The service tag was securely attached.  
 The PSV seal wire was attached and intact.  
 The outlet piping provided positive drainage for the PSV.  
 There were no valves located on PSV piping.

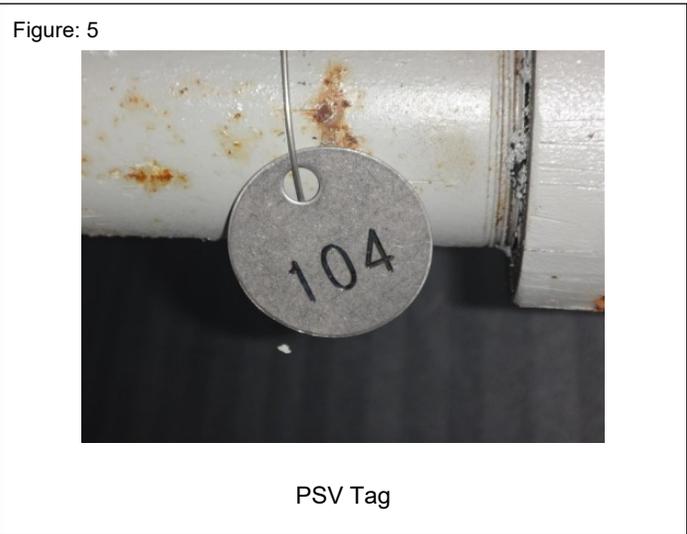
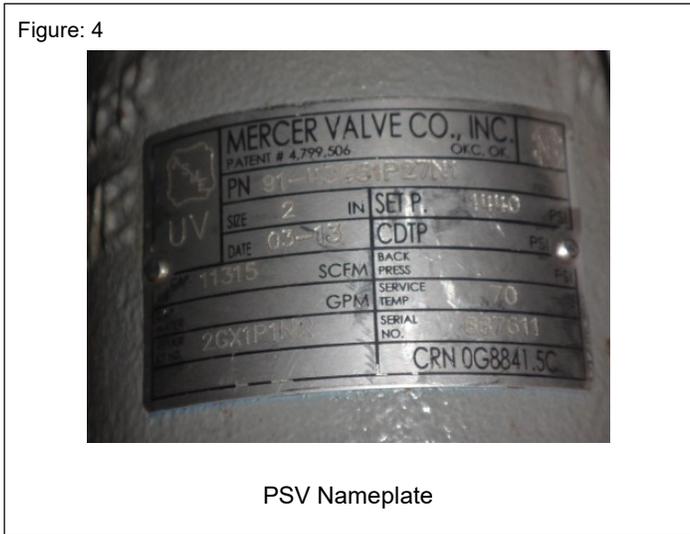
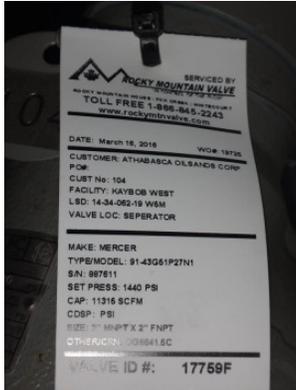




Figure: 6



PSV Service Tag

Figure: 7



PSV General



**External Observations**

Certificate of inspection permit : No  
Grounded : Yes CUI checked : No  
Attachments : No Drains :Automatic  
Vessel Orientation : Vertical Installation :Partial  
Ladders/Platforms : N/A  
Support Structure : Skirt  
External Covering : Coated  
Condition : Acceptable  
Manway : No  
Nameplate attached and legible : Yes

The nameplate was legible and securely mounted to the vessel.  
The vessel was identified per A-number and serial number stamped on the nameplate of the vessel.  
The heads, shell, nozzles and bolting appeared to be in good condition.  
The gauges were in good condition.

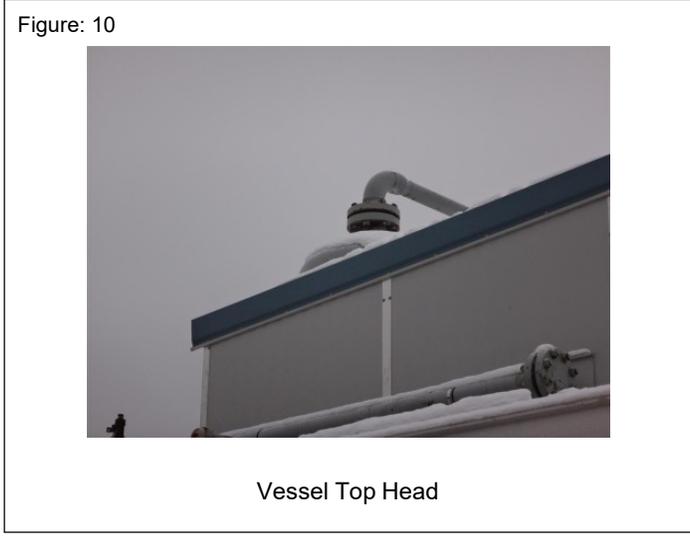




Figure: 12



Vessel Bottom Head

**Internal Observations**

No internal inspection were completed.

**UT1 Observations**

See attached ultrasonic testing (UT) report.

**General Observations**

Equipment was in operation at time of inspection.

There was no rotational equipment in or around this building.

No vibration induced damage was evident.

The gauge(s) and associate equipment all appeared to be in good condition and operational.

**Recommendations**

1. The vessel is fit for service.
2. No PSV capacity calculation found at the time of inspection, therefore conduct calculations to close out NCR.

Note: Risk evaluated, and inspection interval was reconciled from 4 to 5 years (CI, 2021-06-17)

Marnes du Plessis

Alberta IBPV #A-74773  
TSASK Pressure Equipment Class I #250  
CWB Level II #8117

Cobus du Plessis

Alberta IBPV #A-60923

**Inspector :** Marnes du Plessis

**Reviewed By:** Cobus du Plessis

	RAE Engineering and Inspection Ltd 4810 - 93 Street Edmonton, AB, T6E 5M4 ph: 780-469-2401 fx: 780-468-2422		Inspection Date:	14-Aug-17	<b>Ultrasonic Thickness Examination</b>
			Page:	1 of 4	
Client: Murphy Oil Company Ltd.		RAE Report #:		17-0010.17.004.014-DS-UT-41-A0614452	
Address: 4000, 520 - 3 Ave, SW, Calgary, AB, T2P 3Y3		Project #:		0010.17.004.014	
Client P.O.#: N/A		Location/LSD:		Kaybob / 14-34-062-19W5	
Client Representative: Daniel Mora		Procedure:		UT-1 - #701B Rev. 6	
		Acceptance Code:		ASME VIII, Div. 1	

**JOB DESCRIPTION**

Item Number:	A0614452	Material:	Carbon Steel		
Item Description:	Vertical Separator	Surface	<input checked="" type="checkbox"/> Painted	<input type="checkbox"/> Bare Steel	<input type="checkbox"/> Machined
		Condition:	<input type="checkbox"/> As Ground	<input type="checkbox"/> Shot Blasted	<input type="checkbox"/> As Welded
		Surface Temp:	<input type="checkbox"/> < 0 °C	<input checked="" type="checkbox"/> 0-120 °C	<input type="checkbox"/> 120-260 °C

**EQUIPMENT, TECHNIQUE & CALIBRATION**

Instrument Mfr:	GE	Model:	USM GO	S/N:	011075009	Cal. Due:	Oct. 2018								
Cal Block S/N:	60764	1 or 2 Point Cal:	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2	Calibrated Range:	0.050" - 0.800"	Couplant:	UTX								
Probe Model	Freq MHz	Angle	Dia. (in)	Probe Type		Manufacturer	Serial #	Cable length	Delay line	Vel. (m/sec)	Transfer Value	Ref dB	Ref %FSH	Scan dB	Range (mm)
1	FH2E	5.0	0°	0.25	<input type="checkbox"/> Single <input checked="" type="checkbox"/> Dual	GE	15A01J43	4'	<input type="checkbox"/>	5850	NA	-	80	As Needed	50.8
2					<input type="checkbox"/> Single <input type="checkbox"/> Dual				<input type="checkbox"/>						
3					<input type="checkbox"/> Single <input type="checkbox"/> Dual				<input type="checkbox"/>						
4					<input type="checkbox"/> Single <input type="checkbox"/> Dual				<input type="checkbox"/>						

**Scope:** Conduct 0° straight beam ultrasonic testing on a vertical separator looking for any signs of wall thinning due to corrosion, erosion, laminations or inclusions.

**Results:** Nominal and minimum measurements were not provided. The measurements obtained show the thickness to be consistent throughout scan locations.

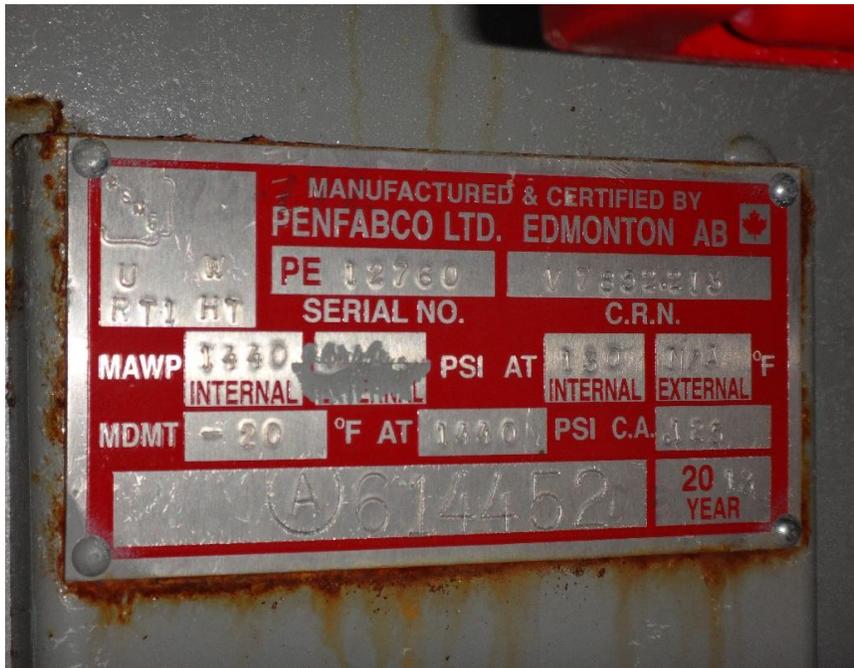
There were no signs of wall thinning, internal corrosion, erosion, laminations or inclusions at the time of inspection.

Please see the following pages for the pictures of the nameplate and the overall view, the isometric drawings, and the thickness measurements.

Client Representative	PRINT	SIGNATURE	CGSB#:	16124	CGSB Level:	II
1 <sup>ST</sup> Technician	Declan Scully PRINT		SNT#:	710B-034	SNT Level:	II
2 <sup>ND</sup> Technician	PRINT	SIGNATURE	CGSB#:		CGSB Level:	
			SNT#:		SNT Level:	

	RAE Engineering and Inspection Ltd 4810 - 93 Street Edmonton, AB, T6E 5M4 ph: 780-469-2401 fx: 780-468-2422	Inspection Date:	14-Aug-17	Ultrasonic Thickness Examination
		Page:	2 of 4	
Client:	Murphy Oil Company Ltd.	RAE Report #:	17-0010.17.004.014-DS-UT-41-A0614452	
Item Number:	A0614452	Project #:	0010.17.004.014	
Item Description:	Vertical Separator	Location/LSD:	Kaybob / 14-34-062-19W5	
		Procedure:	UT-1 - #701B Rev. 6	
		Acceptance Code:	ASME VIII, Div. 1	

**Photographs of Equipment**



**Nameplate**



**Overall View of Equipment**

Client Representative	PRINT	SIGNATURE				
1 <sup>ST</sup> Technician	Declan Scully		CGSB#:	16124	CGSB Lvl:	II
	PRINT	SIGNATURE	SNT#:	710B-034	SNT Lvl:	II
2 <sup>ND</sup> Technician	PRINT	SIGNATURE	CGSB#:		CGSB Lvl:	
			SNT#:		SNT Lvl:	



RAE Engineering and Inspection Ltd  
 4810 - 93 Street Edmonton, AB, T6E 5M4  
 ph: 780-469-2401 fx: 780-468-2422

Inspection Date:

14-Aug-17

Ultrasonic Thickness

Page:

3 of 4

Examination

RAE Report #:

17-0010.17.004.014-DS-UT-41-A0614452

Client:

Murphy Oil Company Ltd.

Project #:

0010.17.004.014

Item Number:

A0614452

Location/LSD:

Kaybob / 14-34-062-19W5

Item Description:

Vertical Separator

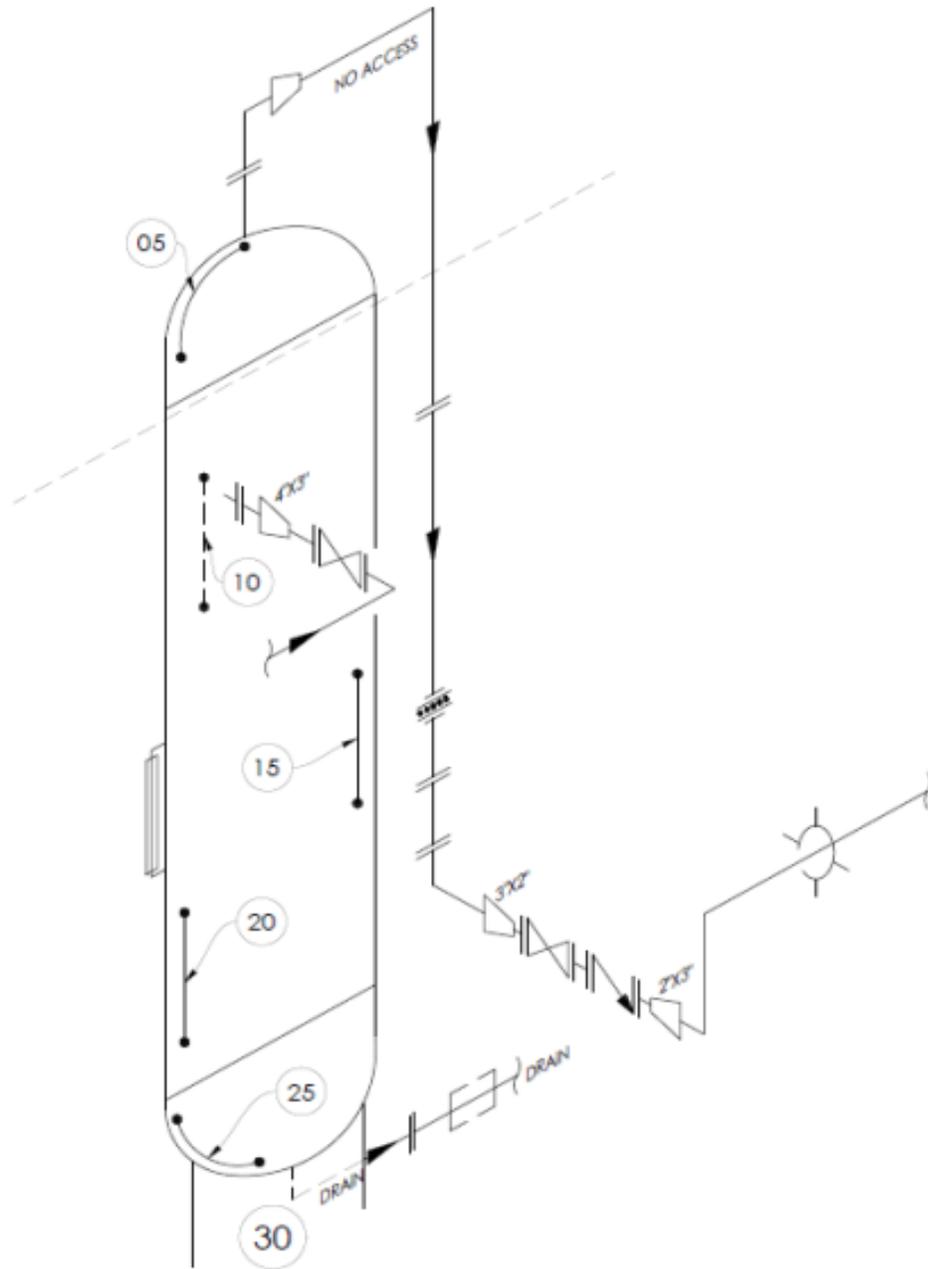
Procedure:

UT-1 - #701B Rev. 6

Acceptance Code:

ASME VIII, Div. 1

ISO Drawing of Equipment and TMLs



Client Representative	PRINT	SIGNATURE	CGSB#:	16124	CGSB Lvl:	II
1 <sup>ST</sup> Technician	Declan Scully PRINT	<i>Declan Scully</i> SIGNATURE	SNT#:	710B-034	SNT Lvl:	II
2 <sup>ND</sup> Technician	PRINT	SIGNATURE	CGSB#:		CGSB Lvl:	
			SNT#:		SNT Lvl:	

