

**Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION**

Job 10.114525

District: Fort Saint John, B.C.	Skid No.
Facility: Wolverine	Location (LSD): d-66-D / 93-P-02
Vessel Name Equipment Number: Line Heater	
Orientation: Horizontal	
Status: In Service	Regulatory Inspection

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. A0505670		CRN Number: P 0431.213 / F 3090.213	
Vessel serial number: 03-4059-1		Size: 42 in. X 12ft.	
Shell thickness: 7.9 mm		Shell material: SA 36	
Head thickness: 7.9 mm		Head material: Structural	
Tube wall thickness: 15.8 mm / 8.7 mm		Tube material: SA 106 B	
Tube diameter: 3 inch / 2 inch		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: Atmospheric	Operating pressure	Shell:
	Tubes: 34689 kpa / 9308 kpa		Tubes:
Design Temp.	Shell: 93 Deg C	Operating temperature	Shell:
	Tubes: 93 deg C		Tubes:
X-ray: RT 1		Heat treatment: HT	
Code parameters: ASME VIII Div 1		Coated: No	
Manufacturer: Opsco Energy		Year built: 2004	
Corrosion allowance: 3.2 mm on shell / 12.5% on piping		Man way: No	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacture / Model / Serial	Set Pressure (PSI / kPa)	Capacity (scfm)	Size	Block Valve	Location	Service by Date

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

Sweet X	Sour X	Oil	Gas X	Water X
Amine	LPG	Condensate X	Air	Glycol X

Other (Describe):

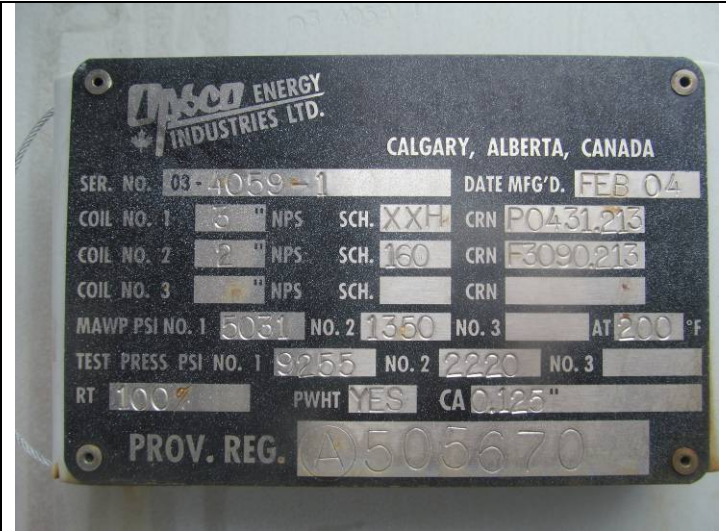
Inspection Interval _____ **PSV Service Interval** _____
 (Determined by MIC in conjunction with Chief Inspector following guidelines of Canadian Natural Resources Limited Owner-User Inspection Program)
 Reports reviewed and accepted by:

Mechanical Integrity Coordinator _____ **Date** _____

Fill out all forms as completely as possible. All information is important! Use back of sheets to record additional information or sketch if required.
 Copy of report to be filed by MIC at site, and copy sent to Chief Inspector

External Inspection Items	G	F	P	N/A	Comments
Insulation Verify sealed around manways, nozzles, no damage present, and there is no egress of moisture.	X				Vessel is insulated – no open or torn sections – no evidence of wet insulation.
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)	X				Paint only on flanged faces of line heater – no exposed metal.
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				No leaks observed.
Saddle/skirt Assess condition of paint, fire protection, and concrete. Look for corrosion, buckling, dents, etc. Look at vessel surface area near supports. Verify no signs of leakage at attachment to vessel and attachment welds are acceptable. Ground wire attached?	X				Saddles: Bolted directly to skid deck – no buckling or dents. No evidence of corrosion at attachment welds to vessel – no stains – no leaks. Ground wire attached to skid.
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	X				Vessel saddles bolted firmly to skid – no deformation.
Concrete foundation Check for cracks, spalling, etc.				X	
Ladder / Platform Describe general condition, ensure support is secure to vessel, and describe any hazards.				X	
Nozzle Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted?	X				Flanged and threaded nozzle joints are fully engaged. No damage or deflections – no leaks. Nozzles are not gusseted.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.				X	No gauges.
External Piping Ensure pipe is well supported. All clamps, supports, shoes, etc. in place. Look for evidence of structural overload, deflection, etc. Paint condition, external corrosion?	X				Piping is well supported, no deflection, all clamps and supports are in place. Piping is insulated – no open or torn sections – no corroded sections under insulation.
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				Valves are supported properly – no leaks.
PSV Ensure PSV is set at pressure at or below that of vessel.		X			No PSV on piping or line heater – PSV located on the glycol contactor provides protection but is set at 1440 PSI and the low pressure piping on the line heater to the contactor is rated at 1350 PSI. So there is really no protection for the gas coil other than restriction of the pressure on the well.
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	X				Ultrasonic corrosion survey carried out – pipe metal thickness detected below nominal minus corrosion allowance. Thickness calculations carried out: UT point 240 (2" elbow) – nominal thickness is 3.9mm / min thickness is 3.3mm / T min thickness is 2.0mm.
Recommendations or corrective actions : (Vessel is Fit for Service or describe corrective actions required) (MIC to review corrective actions with Operations, discuss with Chief Inspector where necessary, and get remedial action implemented) Recommendations: 1. Review requirement for PSV protection on the low pressure gas coil of this line heater. Summary: This line heater is in good condition, visual external and ultrasonic thickness inspection carried out – Pipe metal thickness detected below nominal minus corrosion allowance. Thickness calculations carried out to ensure sufficient metal exists for safe operation.					
Line Heater is fit for service.					

Photo Table



Data plate



Overview



Overview



Ground