

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

Job 4016101

District: Fort St. John, BC	Skid No.
Facility: Pee Jay Battery Nancy Unit # 3	Location (LSD): d-65-H / 94-A-15
Vessel Name Equipment Number: Free Water Knockout Drum	
Orientation: Horizontal	
Status: In Service	Regulatory Inspection

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. A0068932		CRN Number: A 6968.21	
Vessel serial number: L-1059		Size: 10 ft. x 25 ft.	
Shell thickness: 9.5 mm		Shell material: SA 285 C	
Head thickness: 11.1 mm		Head material: SA 283 C	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: 50 PSI	Operating pressure	Shell:
	Tubes:		Tubes:
Design Temp.	Shell: 149° C	Operating temperature	Shell:
	Tubes:		Tubes:
X-ray: Nil		Heat treatment: Nil	
Code parameters: ASME VIII, Div. 1		Coated: Yes	
Manufacturer: NATIONAL TANK CO.		Year built: 1967	
Corrosion allowance: Not Stated		Manway: Yes	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacture / Model / Serial	Set Pressure (PSI / kPa)	Capacity (scfm)	Size	Block Valve	Location	Service by Date
2415F	Wellmark / W9503-RN / 67893-4	50 PSI	2445 SCFM	3 x 3	No	Top shell	Unified 05/2015

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

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

Other (Describe):

Inspection Interval _____ **PSV Service Interval** _____
(Determined by MIC in conjunction with Chief Inspector following guidelines of Canadian Natural Resources Limited's 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			Cladding in fair overall condition – no open or torn sections- minor exposed insulation on the north head due to no caulking and poor sealant – minor evidence of egress of moisture at 12 O'clock from openings in the roof
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)		X			Paint in fair condition – minor flaking and peeling to less than 10% of shell surface concentrated at 12 O'clock - isolated areas with spotting external corrosion – pitting to 0.020 inch max
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.		X			Evidence of minor seepage detected at threaded connection to liquid level controller- causing external staining on side shell Evidence of minor seepage detected at inlet flange connection – causing external staining on side shell
Saddle 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				Paint in good condition – no corrosion, buckling or dents – attachment welds are acceptable with no sign of leaks – ground wire attached to skid
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	X				Vessel is securely welded to skid floor – no deformation
Concrete foundation Check for cracks, spalling, etc.				X	None
Ladder / Platform Describe general condition, ensure support is secure to vessel, and describe any hazards.				X	None
Nozzle Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted?	X				Paint in good condition – no leaks – stud threads fully engaged – no damage or deflection – no gussets Isolated area on the inlet nozzle with spotting external corrosion – minor paint flaking.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.	X				Gauges are clear and functional – no leaks Suitable for MAWP: 50 – 400° F Suitable for MDMT: -20 - 120°C
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 – all clamps in place – no evidence of structural overload or deflection – paint in good general condition – minor chipping – no corrosion or damage
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				No leaks detected – valves are properly supported
PSV Ensure PSV is set at pressure at or below that of vessel. Discharge piping is same size as inlet to valve and is properly supported and routed. Ensure no block valves between PSV and vessel or if there are they are locked open.	X				PSV is set at vessel MAWP - Discharge piping is same size as valve outlet and is properly supported and routed – seal is intact – no block valve – discharges to closed system.

<p>NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)</p>	<p>X</p>			<p>Ultrasonic corrosion survey carried out – shell and pipe metal thickness detected below nominal. Thickness calculations carried out: UT point 735 (shell) – nominal thickness is 9.5 mm / min thickness is 8.1 mm / T min thickness is 7.9mm UT point 795 (4” elbow) – nominal thickness is 8.6 mm / min thickness is 7.1 mm / T min thickness is 2.5 mm 3” Circ band - normal thickness is 7.6 mm/min thickness is 3.4 mm/T min thickness is 2.5mm.</p>
<p>Other</p>				
<p>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) Recommend to address and correct areas of seepage at next maintenance opportunity Summary: This vessel is in good condition, visual external and ultrasonic thickness inspection carried out – shell and pipe metal thickness detected below nominal. Thickness calculations carried out to ensure sufficient metal exists for safe operation. Corrosion rate based, on greatest thickness loss (shell) 0.026mm per year. Retirement Date to “T”min is year 2028. Vessel is fit for service.</p>				

Inspected By:  Dallas Wiedman PESL # 000275

Date: February 11, 2020



LSD



Overview North Head



Overview South Head



Manway



Data Plate



Temperature Gauge



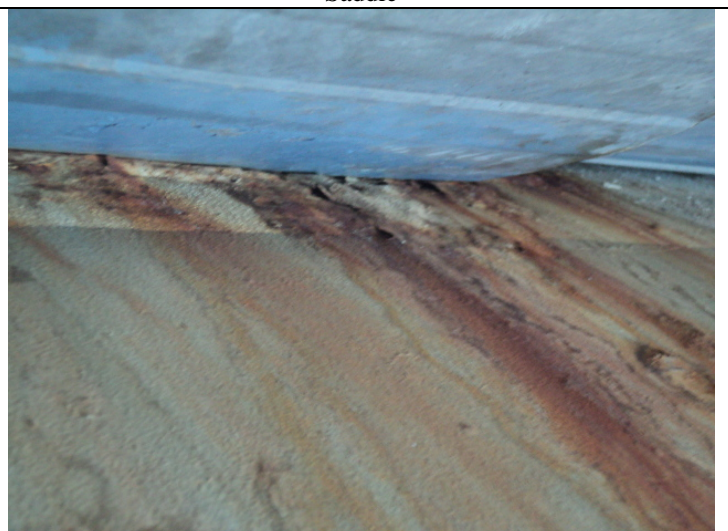
Temperature Gauge



Saddle



Paint peeling at 12 O'clock



Shell at 12 O'clock



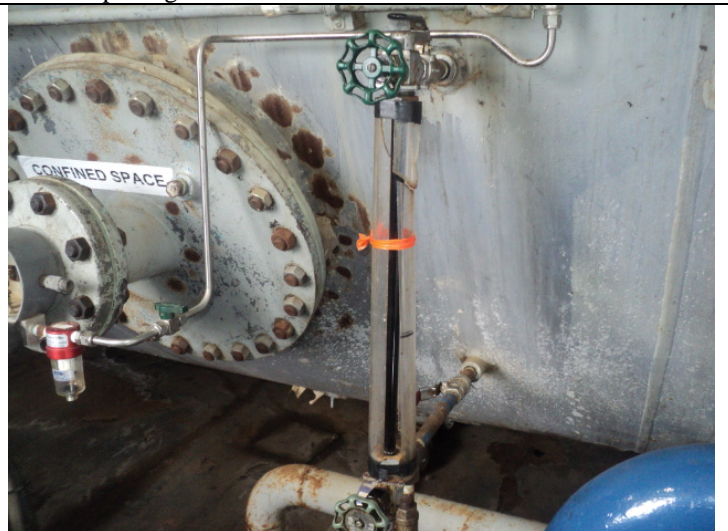
Spotting external corrosion on shell



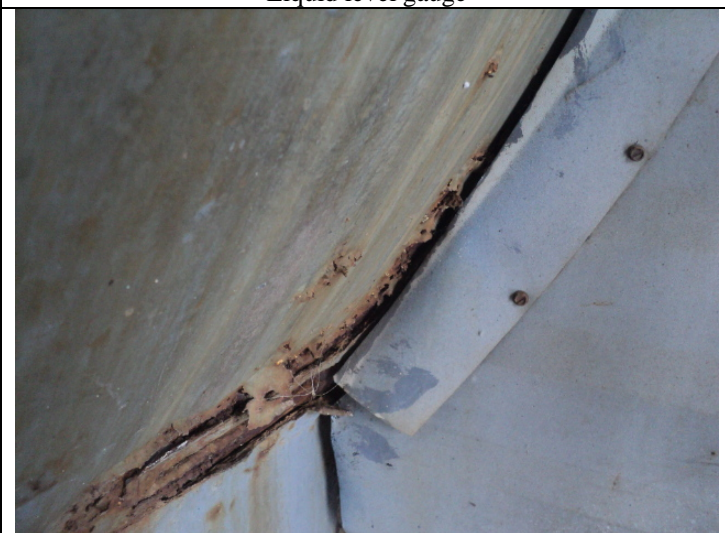
Spotting external corrosion on lower shell and boot



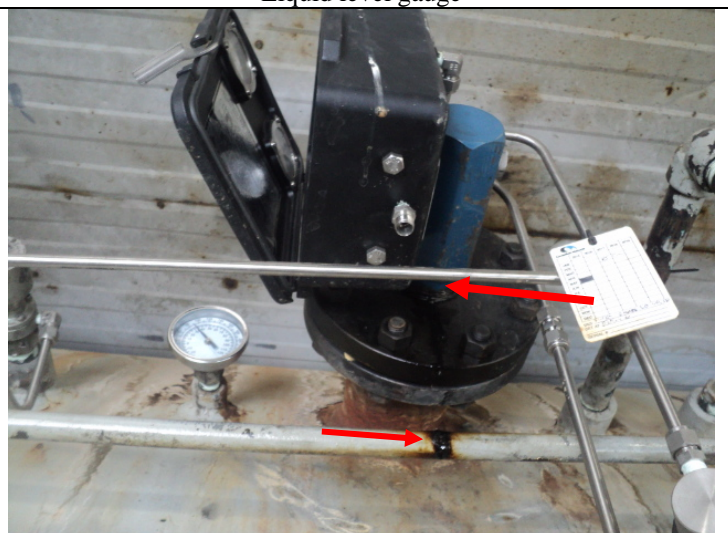
Liquid level gauge



Liquid level gauge



General condition of north head seal



Liquid level gauge evidence of seepage at threaded connection



Macro of threaded connection



Evidence of external staining due to seepage



Evidence of external staining due to seepage



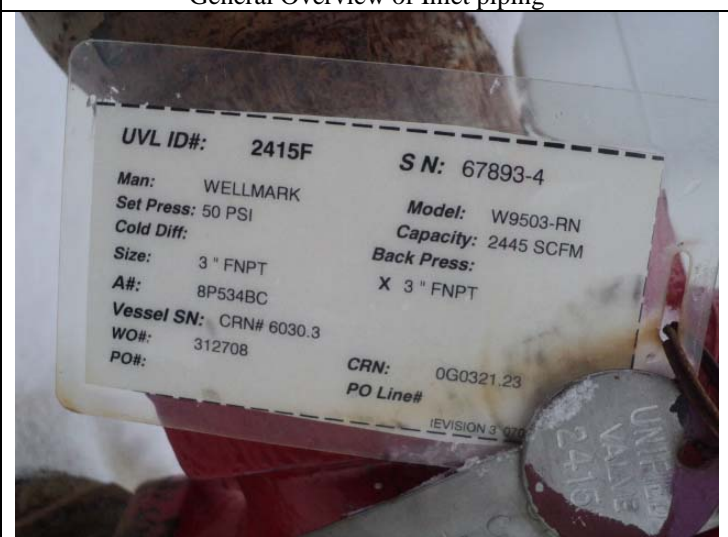
Macro of flanged connection



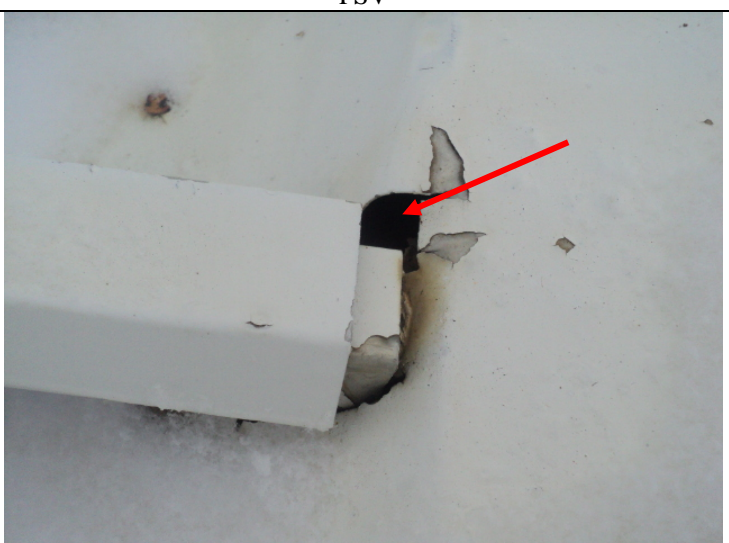
General Overview of Inlet piping



PSV



PSV Service Tag



General roof condition