

**Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION Job# 10.110451**

District: Fort St John, BC	Skid No.
Facility: Flatrock Battery	Location (LSD): 17-20-85-17 W6M
Vessel Name Equipment Number: Flare Knockout	
Orientation: Horizontal	
Status: In Service	Regulatory Inspection

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. C 45029		CRN Number Non Code	
Vessel serial number: SWT 0175		Size: 4 ft x 10 ft	
Shell thickness: 9.5 mm		Shell material: SA-516-70	
Head thickness: 9.5 mm		Head material: SA-516-70	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
MAWP	Shell: 14.9 PSI	Operating pressure	Shell:
	Tubes:		Tubes:
Design Temp.	Shell: 100 F	Operating temperature	Shell:
	Tubes:		Tubes:
X-ray: Nil		Heat treatment: Nil	
Code parameters: Non code		Coated:	
Manufacturer: Swatech Industries Limited		Year built: 2002	
Corrosion allowance: Not Stated		Manway: No / Hand hole	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacture	Model #	Serial #	Set Pressure (kPa)	Capacity (scfm)	Service Date
None						
CRN #	Service By	Block Valve	Location	Size	Code Stamp	

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

Sweet	Sour <input checked="" type="checkbox"/>	Oil <input checked="" type="checkbox"/>	Gas <input checked="" type="checkbox"/>	Water <input checked="" type="checkbox"/>
Amine	LPG	Condensate <input checked="" type="checkbox"/>	Air	Glycol

Other (Describe):

Inspection Interval _____ **PSV Service Interval** _____

(Determined by MIC in conjunction with Chief Inspector following guidelines of CNRL'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			No insulation. Vessel is located in a building. Standing water in building.
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)		X			Paint has burnt off of head where Heater is located. Surface corrosion is evident on lower shell from standing water. Floor of building is starting to corrode due to high humidity.
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				No leaking detected.
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 are in good condition – no buckles or distortion. Paint intact – with minor surface corrosion. Vessel is grounded.
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.				X	Welded.
Concrete foundation Check for cracks, spalling, etc.				X	Skid mounted
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				All threads engaged. No deflection – no leaks. No gussets. Painting good overall condition.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.				X	None
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 and supports are in place. No structural overloads or deflections. No signs of leaking.
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				Well supported – no leaks.
PSV Ensure PSV is set at pressure at or below that of vessel.				X	None
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	X				Ultrasonic thickness survey carried out (Feb 2011) – no readings below nominal thickness minus corrosion allowance.
<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) Seal building to prevent water ingress and subsequent corrosion. 2.) Catadyne heater should be repositioned to prevent further damage to vessel. Summary: Long term corrosion rate based on greatest thickness loss (Nozzle) 0.056mm per year. Retirement Date to “T”min is year 2101. Vessel is fit for service.</p>					



LSD



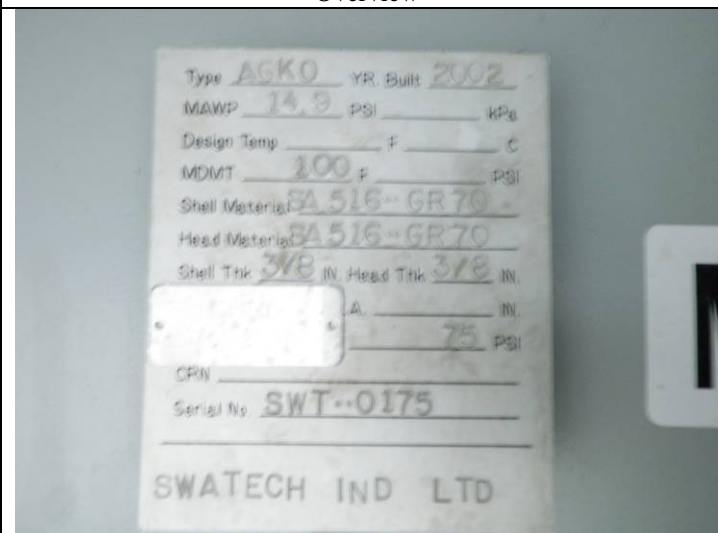
Skid



Overview



Overview



Data Plate



C Tag



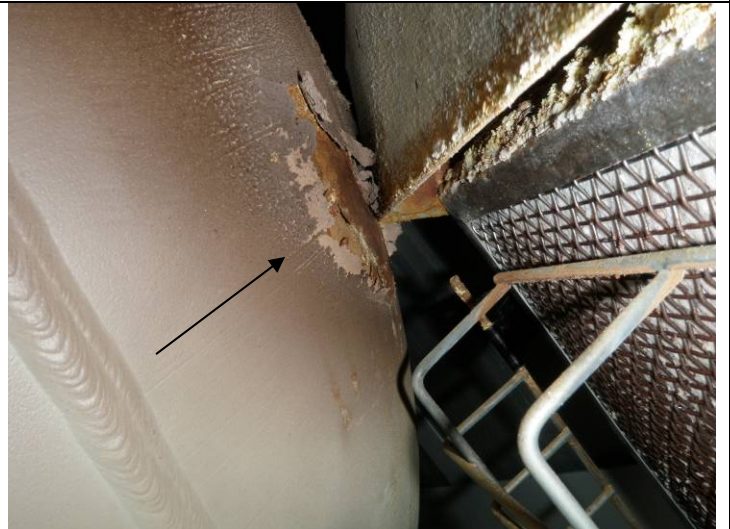
Standing water - **Surface corrosion**



Ground wire attached



Catadyne Heater – close proximity to vessel



Heat damage to head

Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.	X				Coating is in good condition. No signs of cracking or failure.
Anodes. How many, type, condition. % consumed. Are they being replaced?				X	No anodes
Internal Piping Is there any? If so, carbon or stainless steel. Describe condition, dents, corrosion, erosion, etc. Ensure supports are secure and any bolts are suitable for future use.				X	None
Trays How many? Type of material. Are valves in place? Check for erosion/ corrosion; wear on tray valve legs. Cleanliness?				X	No trays.
Baffles, deflector plates, etc. If present, describe condition. Look closely at welds attached to vessel wall.	X				Inlet deflector plating is intact. No signs of erosion. No damage or distortion.
South Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				Head is in good condition. No corrosion or no pitting. No signs of damage or distortion.
North Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				Head is in good condition. No corrosion or no pitting. No signs of damage or distortion.
Shell Sections Record number of shell sections. Record location, size and depth of all erosion, corrosion or mechanical damage. Describe general condition. If any corrosion greater than corrosion allowance is observed in either shell or head, discuss with Chief Inspector before closing vessel.	X				Shell sections are in good condition. No signs of damage or distortion. No signs of erosion or corrosion. Product scale on lower half of shell and heads. No signs of attack behind product.
Demister pad Is it in place? Is it clean? If any corrosion is apparent in vessel, lift pad and check top head for corrosion.				X	None
Welds Inspect all welds, including attachment welds. Record all service-related damages and if there is any discuss with Chief Inspector before closing.	X				Good condition, no corrosion or pitting.
Repairs Required. If yes, ensure procedure and copy of AB 40 is on file, and one sent to local ABSA, and Chief Inspector				X	No repairs required.
NDE Was any NDE done. (MI coordinator to review results)				X	No internal NDE at this time.
<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: None at this time. Summary: This vessel is in good overall condition, visual internal carried out. Vessel is fit for service</p>					



Manway



North Head



Inlet nozzle and deflector plating



Lower shell



Scale on shell



South Head (and a damn fine operator)