

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

District: Fort St John, B.C.	Skid No.
Facility: Flat Rock Battery	Location (LSD): 15-20-85-17 W6M
Vessel Name Equipment Number: Treater	
Orientation: Horizontal	
Status: In Service	Regulatory Inspection

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. C38596		CRN Number: H8265.231	
Vessel serial number: L-8-356		Size: 6' x 24'	
Shell thickness: not stated		Shell material: SA 516 70N	
Head thickness: not stated		Head material: SA 516 70N	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: 70 PSI	Operating pressure	Shell:
	Tubes:		Tubes:
Design Temp.	Shell: 200 F	Operating Temp.	Shell:
	Tubes:		Tubes:
X-ray: RT-4		Heat treatment: NIL	
Code parameters: ASME VIII Div 1		Coated: Yes	
Manufacturer: Natco Canada		Year built: 1994	
Corrosion allowance: not stated		Manway: Yes	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacture	Model #	Serial #	Set Pressure (PSI)	Capacity (scfm)	Service Date
Removed for service						
CRN #	Service By	Block Valve	Location	Size	Code Stamp	

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 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				Vessel is 50 % insulated. Cladding in good condition. Strapping intact. No open sections.
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)	X				Paint is in good condition. No signs of damage or distortion.
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				Saddle is in good condition – no buckles or distortion. Paint intact – with little to no corrosion. No signs of leakage. Vessel grounded through the skid package.
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	X				Saddles are firmly welded to skid floor. No signs of corrosion.
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				Firmly intact. No loose or missing hardware.
Nozzle Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted?	X				No deflection – no leaks. Stud threads fully engaged, no gussets. Paint is in good overall condition.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.				X	Removed for service.
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		Well supported – no deflection – all clamps and shoes in place. Piping is painted and is in good overall condition.
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. 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	Removed for service.
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	X				Ultrasonic corrosion survey carried out, no metal thickness detected below nominal 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: None at this time. Summary: This vessel is in good condition, visual external and ultrasonic thickness inspection carried out – no metal thickness detected below nominal minus corrosion allowance. Long term corrosion rate based on greatest thickness loss (Nozzle) 0.047mm per year. Retirement Date to “T”min is year 2122. Vessel is fit for service.</p>					

External



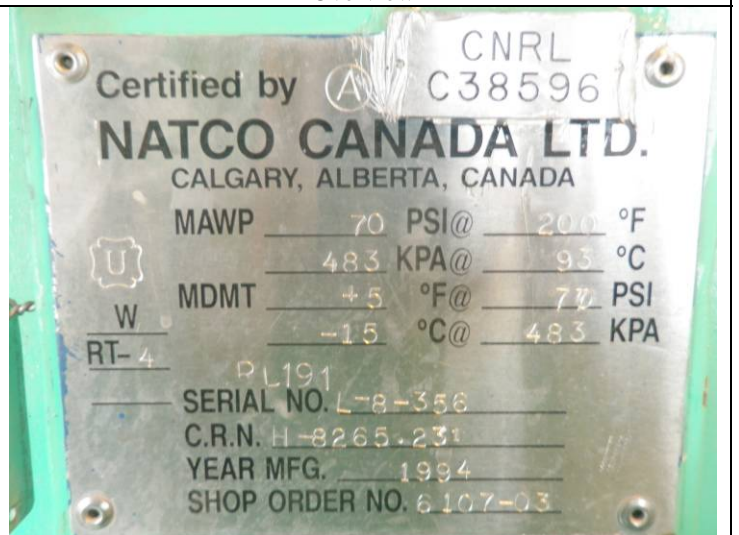
LSD



Overview



Overview



Data Plate



Saddles



Saddles

Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.	X				Coating is in good overall condition. Some minor failures at manways and shell. These coating failures were patched with Davoe #142
Anodes. How many, type, condition. % consumed. Are they being replaced?	X				4 Anodes are installed in Treater. Consumption ranges from 30 – 50%. Anodes are to be replaced during this outage.
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				Internal piping is in good condition. No signs of deflection. Well supported.
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. Electro-plating is firmly attached to shell. This equipment is no longer in use. There is erosion to the plating (5 %), but this does not affect the structural integrity of the plating.
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. Signs of bio-fouling on shell. This is surface only and is not penetrating the coating.
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				Clean and intact.
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				Patch repairs to coating were carried out.
NDE Was any NDE done. (MI coordinator to review results)	X				MPI performed on Fire Tube welds. Cracking found, excavated and rewelded. MPI carried out at repairs with no cracking found.
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. Summary: This vessel is in good overall condition, visual internal carried out. Vessel is fit for service					

Internal



Fire Tube manways



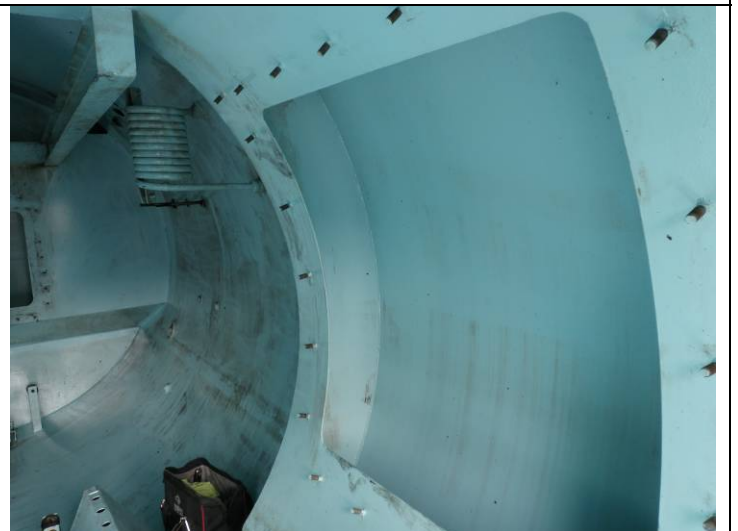
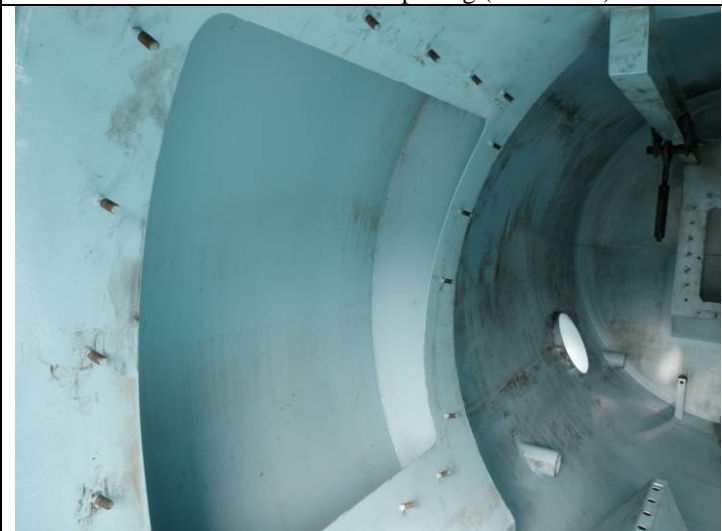
Support Structure – fire tubes



Inlet nozzle and deflector plating (no erosion)



Flow Channels



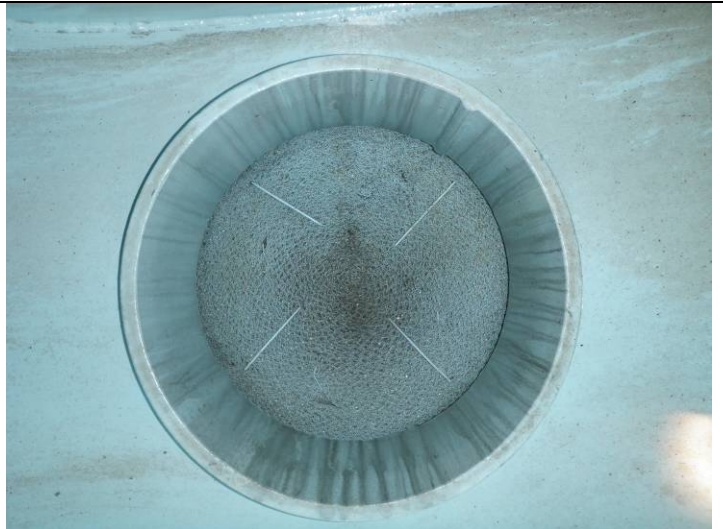
Flow Channels



Flow Channels



Nozzles/Thermal wells



Nozzles/Shell



Demister



Cathode supports

Vortex



Cathodes



Manway (water dump section)



Overview (erosion on electroplating – no longer in service)



Upper Shell



Water Dump piping



Bio-fouling on weir – surface only



Lower shell/Cathode support/Vortex



Head to shell surface and weld



Fire Tube #1



Fire Tube #2