

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

Job# 10.180528

District: Fort St John, BC	Skid No.
Facility: South Buick Compressor Station	Location (LSD): d-78-I / 94-A-11
Vessel Name Equipment Number: Oil Treater	
Orientation: Horizontal	
Status: In Service	Regulatory Inspection

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. A3151394		CRN Number: N 0617.21	
Vessel serial number: 95-1699		Size: 10 ft x 40 ft	
Shell thickness: 9.5 mm		Shell material: SA 516 70N	
Head thickness: 12.5 mm / 21.3 mm		Head material: SA 516 70N	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: 75PSI	Operating pressure	Shell:
	Tubes:		Tubes:
Design Temp.	Shell: 250DegF	Operating temperature	Shell:
	Tubes:		Tubes:
X-ray: RT-1		Heat treatment: HT	
Code parameters: ASME VIII, Div. 1		Coated: Yes	
Manufacturer: I.P. Contractors		Year built: 1995	
Corrosion allowance: 1.6 mm		Manway: No	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacture / Model / Serial	Set Pressure (PSI / kPa)	Capacity (scfm)	Size	Block Valve	Location	Service Date
	No Access				No	Top Shell	

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

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

Other (Describe):

Inspection Interval _____ **PSV Service Interval** _____

(Determined by MIC in conjunction with Chief Inspector following guidelines of Canadian Natural Resources 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 approximately 80% insulated – good overall condition – no damage or open sections and no egress of moisture
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)	X				Paint in good condition – no exposed metal or corrosion
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				No leaking detected.
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 – no sign of leaks – attachment welds are not visible Skid package is grounded.
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	X				Saddle firmly bolted to skid deck.
Concrete foundation Check for cracks, spalling, etc.				X	Steel pilings
Ladder / Platform Describe general condition, ensure support is secure to vessel, and describe any hazards.				X	No ladder or platform
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 – all studs fully engaged to nuts – no short bolts. No deflection, corrosion or leaks. No gussets.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.	X				Pressure gauge: No pressure gauge. Temp gauge: 0-250DegF
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 in place. Painted piping in good condition – no exposed metal – no corrosion. Insulated piping – cladding intact – no exposed metal – no wet insulation.
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				Located on top shell – no access to the PSV at this time
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)				X	No NDE at this time.
Other					
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: see inspection summary below					

Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.	X				Treater is 100% internally coated, with the exception of a few “bolted” sections of angle iron used for the fire tube supports. A few minor chips noted on the bottom shell and lower head were hand patched with epoxy at time of inspection. More extensive coating damage to the upper portion of the fire tube nozzles and the inlet defuser noted
Anodes. How many, type, condition. % consumed. Are they being replaced?		X			5 anodes in place at time of inspection – all about 25 – 30% consumed – recommend replacement
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	None
Baffles, deflector plates, etc. If present, describe condition. Look closely at welds attached to vessel wall.	X				Several weirs and screens in place – good overall condition – mechanical damage – no damaged coating – attachment welds in good condition
Back Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				Head is in good condition, completely coated – no corrosion / erosion or mechanical damage
Front Head (fire tube) Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				Head is in good condition – no corrosion / erosion or mechanical damage – a few minor chips in the coating were patched
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 is in good overall condition – no corrosion / erosion or mechanical damage

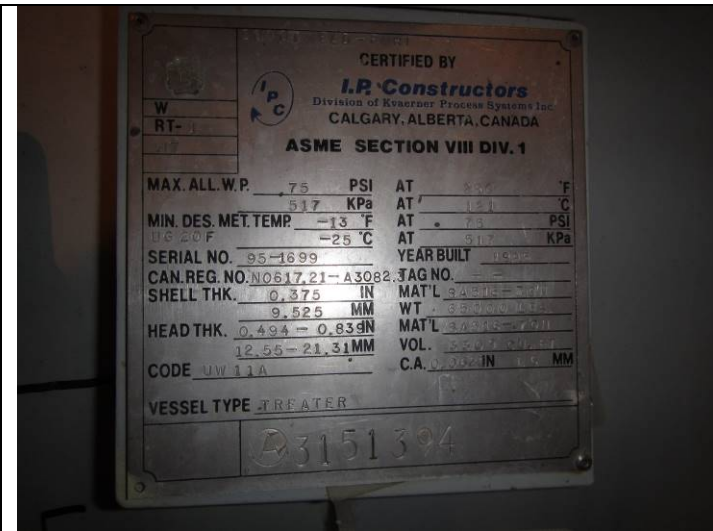
Demister pad Is it in place? Is it clean? If any corrosion is apparent in vessel, lift pad and check top head for corrosion.	X			Demister pas in place at time of inspection – bottom 4 inches were found to be plugged with solids but is in otherwise good clean condition
Welds Inspect all welds, including attachment welds. Record all service-related damages and if there is any discuss with Chief Inspector before closing.	X			All welds inspected were found full and complete – no corrosion or service related damage
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			MPI was carried out on fire tubes welds – no cracking detected
Fire Tubes	X			Fire tubes were found in good clean condition – no corrosion, cracking or mechanical damage noted Dimensions: 24 ft. in length, 24 inch diameter, UT suggests a nominal of 12.7 mm
<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)</p> <p>Recommendations: 1.Repair the remainder of damaged coating. 2. Replace all anodes</p> <p>Summary: Vessel is in overall good condition, visual internal and external inspection performed—no metal thickness detected below nominal minus the corrosion allowance. All coating damage to the heads, shell and the 6:00 of the fire tube nozzles were repaired at the time of inspection. The remainder of the coating damage is isolated to the upper sections of the fire tube nozzles; caused mechanically by the removal of the tubes and blistering by possible heat exposure. Approximately 5 square foot area of damage total.</p> <p>Fire tube dimensions: 24inch x 24 ft. Spill box height from bottom shell: 96 inches Vessel is fit for service.</p>				

Inspected By:  Andrew Neis. API 48747 / IPV#880

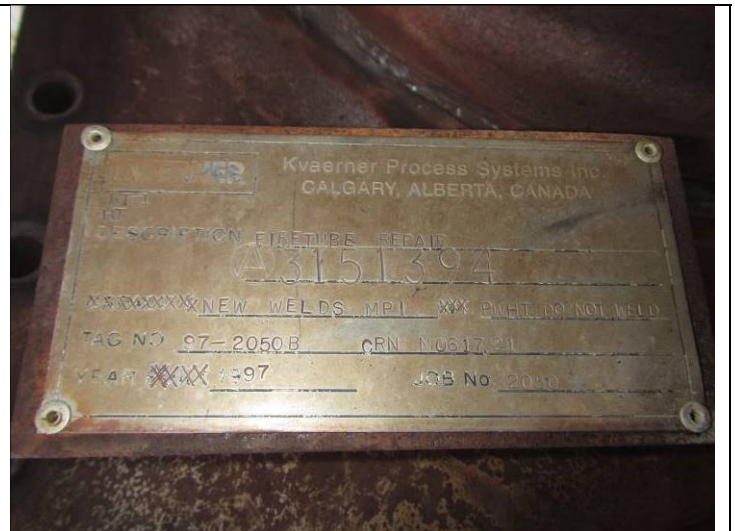
Date: Nov 20, 2018

Photo Table

	
LSD	Overview



Data Plate



Repair data plate found on fire tube



Head



Saddle



Temperature gauge



PSV



Fire tube



Coating damage and blistering to upper portion of fire tube nozzle right



Coating damage and blistering to upper portion of fire tube nozzle left



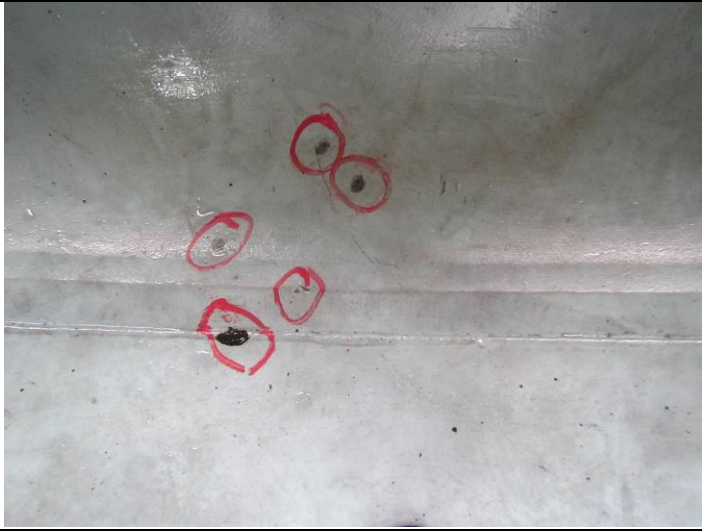
Coating repairs



Internal overview – front end



Vortex breaker



Minor coating damage



Repairs to coating



Anode 1



Bottom shell overview



Coating blistering to inlet defuser – not pressure envelope



Anode 2



Throwwells



View underneath first weir



Inlet defuser



Manway – back end



Manway back end



Anode 3



Anode 4



Anode 5



Weir



Screen overview



Demister pad



Spill over box



View into spill box



2 inch Victaulic fitting



4 inch Victaulic fitting



Drain nozzle



Screen overview