Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION **Job: 10.113559**

District: **Fort St. John BC**	Skid No.
Facility: **Graham**	Location (LSD): **c-76-K-94-B-08**
Vessel Name Equipment Number: **Separator**	
Orientation: **Horizontal**	
Status: **In Service**	**Regulatory Inspection**

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. **A0454381**		CRN Number: P0334.21	
Vessel serial number: 2000-6332-01		Size: 66 in. X 24 ft.	
Shell thickness: 76.2mm		Shell material: SA 516-70N	
Head thickness: 74.mm		Head material: SA 516-70N	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: 1332 PSI	Operating pressure	Shell:
	Tubes:		Tubes:
Design Temp.	Shell: 200 Deg F.	Operating temperature	Shell:
	Tubes:		Tubes:
X-ray: RT1		Heat treatment: Ht	
Code parameters: ASME VIII Div 1		Coated: Yes	
Manufacturer: Alco Gas & Oil		Year built: 2000	
Corrosion allowance: 3.2mm		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
					No	Top shell	

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

Sweet	Sour X	Oil	Gas X	Water
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_____

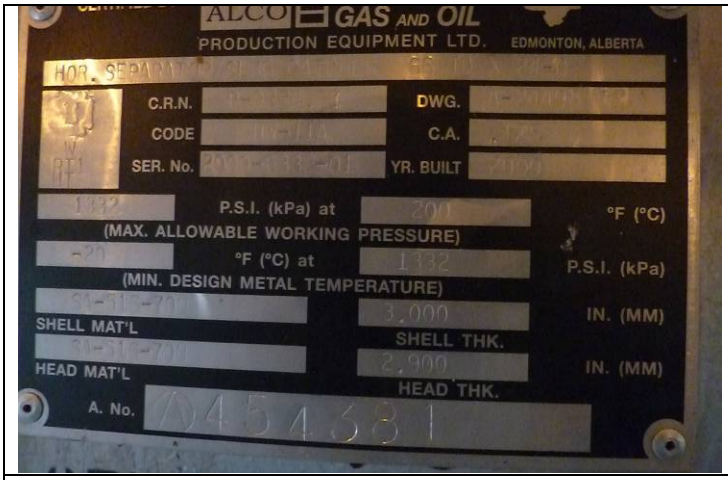
Fill out all forms as completely as possible. <u>All information</u> is important! Use back of sheets to record additional information or sketch if required.
Copy of report to be filed by MIC at site, and copy sent to Chief Inspector

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 not insulated.**
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.**
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 floor. No buckling or dents.** **No corrosion at attachment welds to vessel.** **Ground wire attached to vessel.**
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	**X**				**Vessel saddles bolted firmly to skid floor – 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**				**Clear and clean – no leak.** **Within operational range for service temperature gauge 0 – 250 Deg F. Pressure gauge 0 – 1000 PSI..**
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.** **Paint in good condition – no exposed metal.**
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**				**Location: top shell – PSV removed for service.** **No block valve between vessel and PSV.** **Discharge piping is same size as valve out let.**
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	**X**				**Ultrasonic corrosion survey carried out April 2013 – pipe metal thickness detected below nominal minus corrosion allowance. Thickness calculations carried out:** **UT point 236 (3" Elbow) – nominal thickness is 5.5mm / min thickness is 4.4mm / T min thickness is 3.8mm.** **UT point 256 (2" Tee) – nominal thickness is 8.7mm / min thickness is 7.0mm / T min thickness is 2.6mm.** **UT point 266 (2" Elbow) – nominal thickness is 8.7mm / min thickness is 6.3mm / T min thickness is 2.6mm.**

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: No recommendations.
Summary: See Internal
Vessel is fit for service.

Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.	X				No blisters or peeling. Coating in good condition.
Anodes. How many, type, condition. % consumed. Are they being replaced?				X	None.
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	
Trays How many? Type of material. Are valves in place? Check for erosion/ corrosion; wear on tray valve legs. Cleanliness?				X	
Baffles, deflector plates, etc. If present, describe condition. Look closely at welds attached to vessel wall.	X				Inlet deflector plate welded to top shell – no mechanical damage or corrosion.
Top Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				Man way access – no mechanical damage or corrosion-attachment welds to head in good condition – no corrosion staining on coating. Coating bonded to head.- no peeling or blisters.
Bottom Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				
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				3 sheet sections- nozzles are clean – boot in good condition – vortex breaker welded firmly to bottom of boot. Vortex breaker welded to shell – no damage. Coating bonded to shell – no peeling or blisters. Nozzles are unobstructed. Weir welded to shell – no bent or damage sections.
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 pad in place – clean- no loose or broken sections. Support bars bolted securely.
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 are coated – no corrosion staining on welds.
Repairs Required. If yes, ensure procedure and copy of AB 40 is on file, and one sent to local ABSA, and Chief Inspector				X	
NDE Was any NDE done. (MI coordinator to review results)					

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: No recommendations at this time.
Summary: This vessel 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.
Vessel is fit for service.



Vessel data plate

Pressure gauge

Temperature gauge

Vessel overview

boot

Man way

	
Demister pad	Back head over view
	
Shell nozzle	Boot
	
Shell nozzle and deflector	Deflector overview

Mid shell tee weld

Weir attachment

Level tube and demister box

Inlet deflector

Man way attachment weld

Internal overview

	
Coated shell tee weld and head weld	