

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

Job 10.113249

District: Grande Prairie AB.	Skid No.
Facility: Clear Hills Gas Plant	Location (LSD): 16-11-88-13W6M
Vessel Name Equipment Number: Low Pressure Inlet Separator	
Orientation: Horizontal	
Status: In Service	Regulatory Inspection

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. A2955267		CRN Number: M 3213.2	
Vessel serial number: 93C-2697-3000		Size: 72 in. X 20 ft.	
Shell thickness: 38.1 mm		Shell material: SA 516-70N	
Head thickness: 43.6 mm		Head material: SA 516-70N	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: 700 PSI	Operating pressure	Shell:
	Tubes:		Tubes:
Design Temp.	Shell: 120 °F	Operating temperature	Shell:
	Tubes:		Tubes:
X-ray: RT 1		Heat treatment: YES	
Code parameters: ASME VIII Div 1		Coated: NO	
Manufacturer: Process Industries		Year built: 1994	
Corrosion allowance: 1.6 mm		Man way: YES - BOOT	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacture / Model / Serial	Set Pressure (PSI / kPa)	Capacity (scfm)	Size	Block Valve	Location	Service by Date
C413	Farris//26KA12-120/S7 //CE44899-1-A10	700 PSI	25200 scfm	3"x 4"	No	Top shell	

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

Sweet	Sour X	Oil	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 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				75 % insulated- no open or torn sections – sealed around saddle and nozzles.
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 support frame. 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 support frame – 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 leakage. Within operational range for service. Pressure gauge 0 – 600 PSI./Temperature gauge 0 – 250 °F
External Piping Ensure pipe is well supported. All clamps, supports, shoes, etc. in place. Look for evidence of structural overload, deflection, etc.	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 - Set at MAWP of vessel. No block valve between vessel and PSV. Discharge piping same size as valve out let. Seal in place.
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	X				Ultrasonic corrosion survey carried out – pipe metal thickness detected below nominal minus corrosion allowance. Thickness calculations carried out: UT point 605 (8” Elbow) – nominal thickness is 10.3mm / min thickness is 8.8mm / T min thickness is 3.8mm. UT point 650 (2” Elbow) – nominal thickness is 5.5mm / min thickness is 4.7mm / T min thickness is 1.6mm.
<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: No recommendations. 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. Short term corrosion rate based on greatest thickness loss (head) 0.150mm per year. Retirement Date to “T”min is year 2074. Vessel is fit for service.</p>					

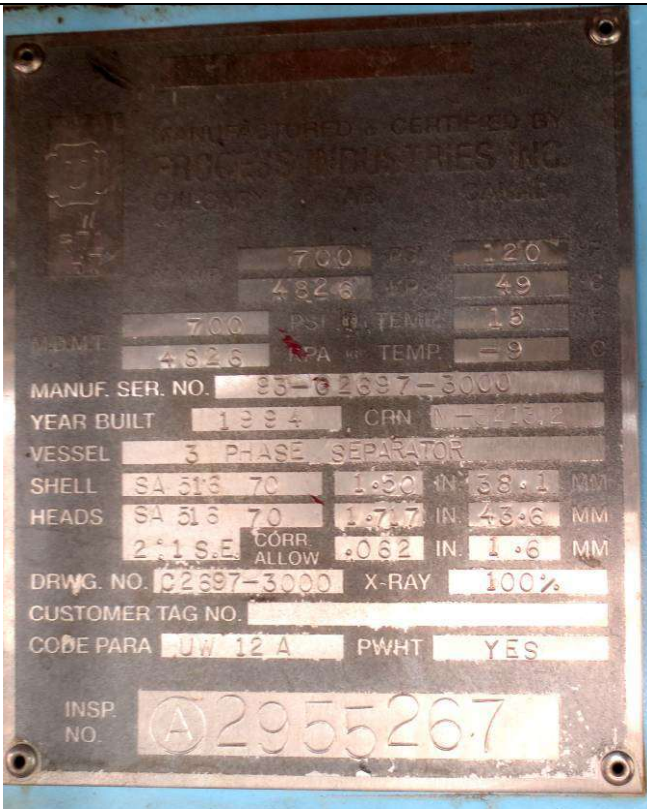
Inspected By: Gerry Avery

Date: March 18, 2013

Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.				X	No internal coating.
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	No internal piping
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				Weir is in good condition with no corrosion or mechanical damage. Inlet deflector is in good condition with no corrosion or erosion.
Inlet Head Note all corrosion, erosion or mechanical damage.	X				Good condition – light scaling – no corrosion or pitting.
Outlet Head Note all corrosion, erosion or mechanical damage.	X				No significant metal loss. No welding defects. No pitting or corrosion.
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 condition with no internal corrosion or pitting. No 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 was not removed for inspection. Good overall condition – not soiled.
Welds Inspect all welds, including attachment welds. Record all service-related damages and if there is any discuss with Chief Inspector before closing.	X				No metal loss at welds. No corrosion or welding defects.
Repairs Required. If yes, ensure procedure and copy of AB 40 is on file, and one sent to local ABSA, and Chief Inspector				None	No repairs required.
NDE Was any NDE done. (MI coordinator to review results)			X		WFMPI was performed on all Shell Tee intersections, nozzles and attachment welds. No cracking.
<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: No recommendations.</p> <p>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. WFMPI was performed on all Shell Tee intersections, nozzles and attachment welds. No cracking.</p> <p>Vessel is fit for service.</p>					

Inspected By: Keith Kowal

Date: June 22, 2013



Vessel data plate



temperature gauge



Pressure gauge



overview



overview



PSV data tag



PSV



Inlet head.



Inlet deflector is in good condition.



Shell is in good condition with no corrosion or pitting.



PSV nozzles are in good condition.



Demister is in good condition – not fouled.



Weir is in good condition.



Vortex breaker.