

Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION **Job # 05.003373**

District: Fort St John, BC		Skid No.				
Facility: Graham Compressor Station		Location (LSD): C-76-K/94-B-8				
Vessel Name & Equipment Number: L.P. Flare Knockout						
Orientation: Horizontal						
Status: In service		Regulatory Inspection				
PRESSURE VESSEL NAMEPLATE DATA						
Registration Number C 34220		CRN Number P 6164.2				
Vessel serial number: 04-94-M051-2		Size: 6 ft x 20 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:				
Design pressure	Shell: 14 PSI	Operating pressure	Shell:			
	Tubes:		Tubes:			
Design Temp.	Shell: 150 deg F	Operating temperature	Shell:			
	Tubes:		Tubes:			
X-ray: NIL		Heat treatment: NIL				
Code parameters: ASME VIII Div I		Coated: Yes				
Manufacturer: Pyramid		Built: 1994				
Corrosion allowance: NIL		Manway: No				
PRESSURE SAFETY VALVE NAMEPLATE DATA						
PSV Tag no.	Manufacture	Model	Serial number	Set Pressure	Capacity	Size
*No PSV Present						
SERVICE CONDITONS-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** _____

C34219

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				Cladding in good condition
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)				X	External condition is hidden from view.
Leakage: Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				No leakages at flanges or threaded joints.
Saddle: Assess condition of paint, fire protection, 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 securely bolted to supports Paint in good condition No Buckling or dents present. No signs of leaking. Ground is connected to skid.
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	X				Vessel secured firmly to crosshead. No deformation.
Concrete foundation Check for cracks, spalling, etc.				X	
Ladder / Platform Describe general condition, ensure support is secure to vessel, 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				No Stud threads present. No leaks-damage or deflections. Nozzles are not gusseted Paint in good condition.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.				X	No gauges present
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. Paint in good condition no corrosion present.
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				No leaks detected Valves are properly supported.
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	No PSV present.
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.
<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: No recommendations at this time.</p> <p>Summary: Vessel is in overall good condition, visual external inspection and ultrasonic corrosion survey performed, no metal thickness detected below nominal minus corrosion allowance.</p> <p>Vessel is fit for service.</p>					

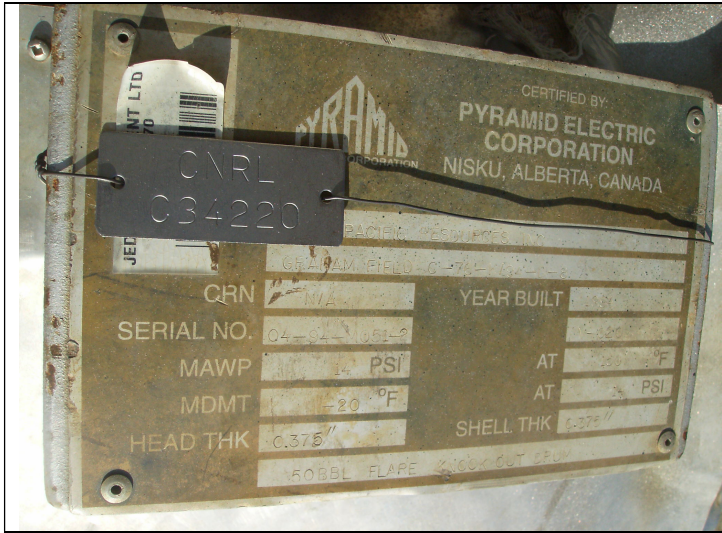
Inspected By: D. Wiedman / Matt Heatcoat

Date: October 15 – 2008

Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.	X				This Vessel is 100% internally coated and is in good overall condition – Note the manway throat coating failed to 10% repairs were made by hand patching.
Anodes. How many, type, condition. % consumed. Are they being replaced?	X				Two anodes were found both were in good condition – less than 2% consumed.
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				Good overall condition, clean and coated, no visible pitting, or corrosion noted that time of inspection.
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				None.
West Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				No mechanical damage, corrosion or erosion was found. Good overall condition.
East Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				No mechanical damage, corrosion or erosion was found. Good overall condition.
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			One shell sections was found to form the vessel & it is in good overall condition. Shell is 100% internally coated and is in good overall condition, except for five 1” diameters previously repaired pits on the bottom shell & the manway throat – both of these areas were hand patched. No mechanical damage, corrosion or erosion was noted.
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				All visible welds appear to be in good overall condition.
Repairs Required. If yes, ensure procedure and copy of AB 40 is on file, and one sent to local ABSA, and Chief Inspector				X	None.
NDE Was any NDE done. (MI coordinator to review results)	X				None 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)</p> <p>Recommendations: 1. Repair all failed coating – coating was hand patched July-08-2009. Summary: This vessel is in good overall condition, visual internal inspection carried out – internal is coated with epoxy – 5 small areas of exposed metal at man way access – hand patched with epoxy grout. No corrosion or pitting. Vessel is fit for service.</p>					

Inspected By: Joe Holdstock

July-08-2009



Data Plate



Overview



Overview



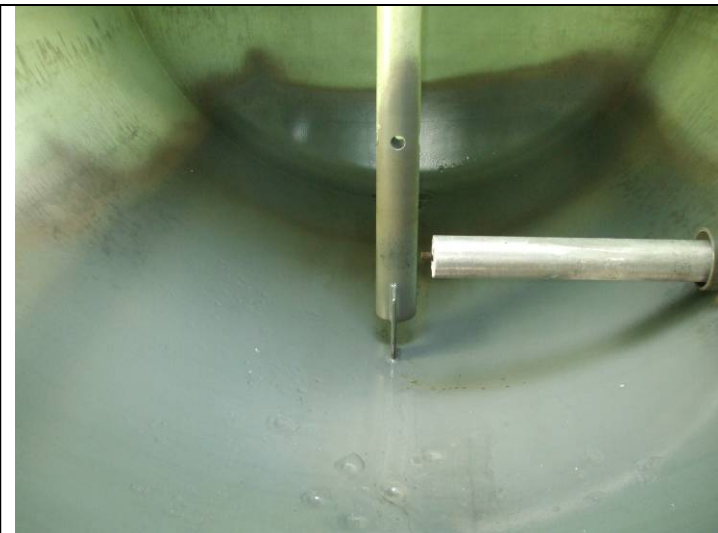
Overview



Overview



East Head



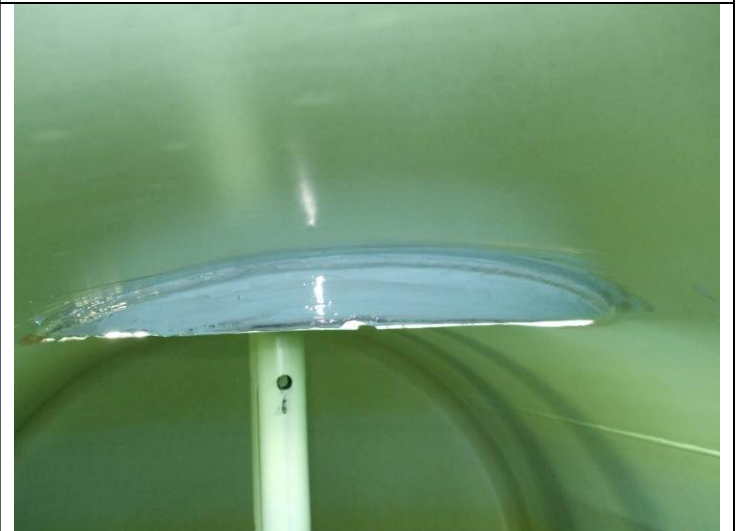
Lower Shell overview



West Head Overview



Coating failure



Coating repaired



Coating repairs bottom shell / Previous coating repairs



Manway cover previous pitting

