Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION Job # 05.001958

District: Ft St John B.C.	
Facility: Halfway Battery	**Location (LSD): 05 – 12 – 87 – 25 – W6M**
Vessel Name & Equipment Number: High Pressure Flare Knock Out Drum	
Orientation: Horizontal	
Status: Operating	**Regulatory Inspection**

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. C 23425		CRN Number Non Code	
Vessel serial number: 001891		Size : 72 in. x 20 ft.	
Shell thickness: 9.5 mm		Shell material: SA 36	
Head thickness: 9.5 mm		Head material: SA 516 70 N	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: Atmos.	Operating pressure	Shell:
	Tubes:		Tubes:
Design Temp.	Shell:	Operating temperature	Shell:
	Tubes:		Tubes:
X-ray: Nil		Heat treatment: Nil	
Code parameters: Non Code		Coated: No	
Manufacturer: NUSCO		Year built: 1998	
Corrosion allowance: Not Stated		Manway: Yes	

PRESSURE SAFETY VALVE NAMEPLATE DATA

Tag No	Manufacture	Model	Serial #	Set Press	Capacity	Size
Serv By	Date	Code Stamp	Block Valve	Location	CRN #	

SERVICE CONDTIONS-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**____ **Max 5 Years**_____
(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**_____

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				Good condition, no open or torn sections.
External Condition: Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)				X	No loose or flaking paint.
Leakage: Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				No leaks detected.
Saddles: 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				No buckling or distortion to saddles. No obvious leaking at saddle to shell welded area – no stains. Skid package is grounded.
Anchor Bolts: Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	X				Firmly welded to skid.
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 seeping detected. No short studs. Nozzles are not gusseted.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.				X	No gussets.
External Piping Ensure pipe is well supported.	X				Firmly supported – no deflection – no corrosion.
Valving: Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				No leaking detected.
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	Atmospheric – discharges to flare.
NDE methods: Was UT/ MPI done on vessel (MI coordinator to review results)	X				Ultrasonic thickness inspection carried out to determine remaining thickness of metal – shell metal thickness detected below nominal – visual internal in 2004 revealed general corrosion – subsequent UT inspection shows increased corrosion rate – still sufficient metal for containment.

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: Carry out internal on next outage.
Summary: This vessel is in very good condition, visual external and ultrasonic thickness inspection carried out – shell metal thickness detected below nominal – general corrosion detected over full surface – still sufficient remaining metal thickness for containment.
Vessel is fit for service.

Inspected By: Joe Holdstock **June-16-2008**

Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.	X				**None.**
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	**Good overall condition with pitting to less than 0.035" deep– carbon steel.** **Heater coil is not in service, blinded.**
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				**Little to 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				**Little to 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				**Two shell sections were found to form the vessel they are in good overall condition.** **Shell is lightly covered with scale deposits firmly attached, with surface corrosion, and minor pitting to less than 0.040" deep, located at the 6:00 position.** **No signs of mechanical damages were 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.**

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: 1. None at this time.
Summary: This vessel is in good over all condition, visual internal / external carried out.
Reboiler is fit for service.

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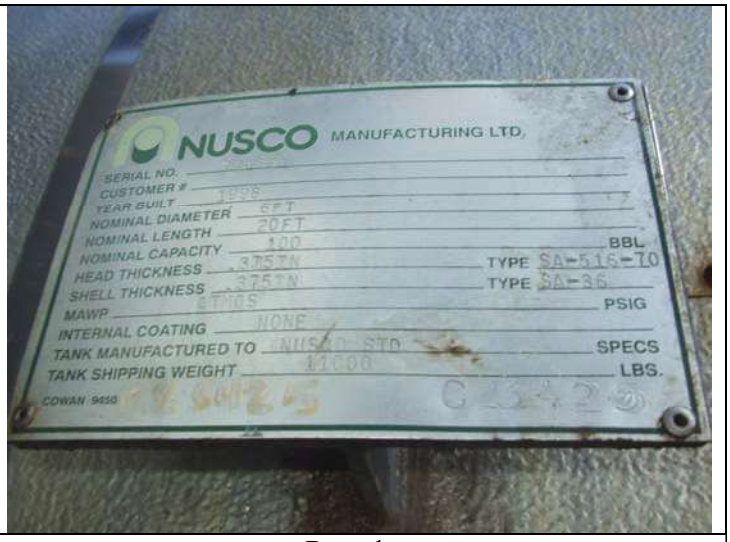

Data plate

Overview

Internal overview

Inlet, overview

Internal float column

Pitting to 0.040” deep

Heater coil overview

Manway throat

Manway