Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION **Job # 105.00774 / 10.110433**

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. **C23425**		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

PSV Tag #	Manufacture	Model #	Serial #	Set Pressure (kPa)	Capacity (scfm)	Service Date
CRN #	Service By	Block Valve	Location	Size	Code Stamp	

SERVICE CONDTIONS-INDICATE ALL THAT APPLY

Sweet	Sour X	Oil	Gas X	Water X
Amine X	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 overall condition, no open or torn sections on vessel section.**
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)				**X**	**Vessel is fully insulated.**
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.	**X**				**No leakage at flanges, threaded joints**
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**				**Saddle:** **This vessel Saddle is in good condition, no signs of damage or leakage to attachment welds.** **Ground firmly secured to skid unit.**
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	**X**				**Vessel is firmly welded to skid pilings.**
Concrete foundation Check for cracks, spalling, etc.				**X**	**None.**
Ladder / Platform Describe general condition, ensure support is secure to vessel, and describe any hazards.				**X**	**None.**
Nozzle Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted?	**X**				**No leakage, stud threads are fully engaged** **Paint is in good condition – no corrosion.** **Nozzles are not gusseted**
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.				**X**	**No Pressure gauge:** **No Temperature gauge:**
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, supports and shoes are in place.** **No structural overloads or deformation.** **Piping is insulated and in good condition – no exposed metal or surface corrosion found.**
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.	**X**				**No leaks are visible at time of inspection.**
PSV Ensure PSV is set at pressure at or below that of vessel.				**X**	**Vessel is atmospheric to Flare Stack, PSV is not required.**
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	**X**				**Ultrasonic thickness survey carried out - shell and pipe metal thickness detected below nominal minus corrosion allowance. Thickness requirements are not based on pressure but containment.** **Shell – Nominal thickness is 9.5 mm / min thickness is 8.9 mm.** **Piping – Nominal thickness is 5.5 mm / min thickness is 4.2 mm.**

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. Monitor corrosion on regular frequency – follow regular interval.
Summary: This vessel is in good over all condition, visual external and ultrasonic thickness survey carried out - shell and pipe metal thickness detected below nominal minus corrosion allowance. Sufficient metal thickness exists for continued operation. Vessel is fit for service.

Inspected By: Joseph Holdstock **Date: Aug 10, 2010.**

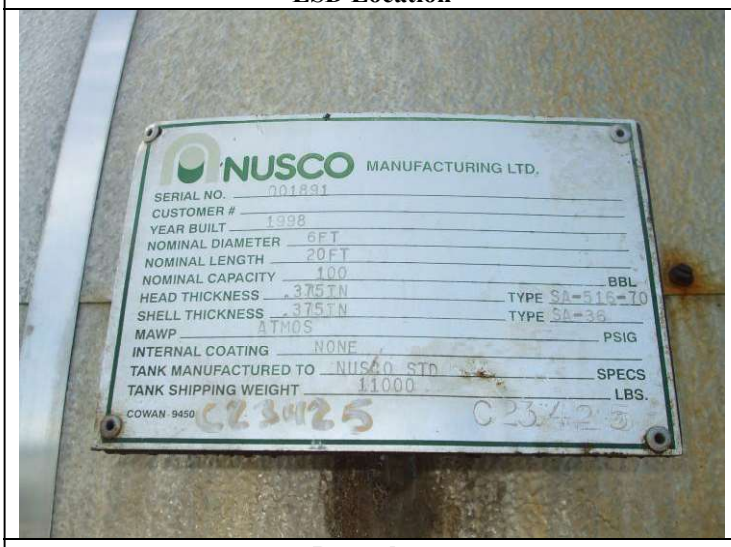
Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.				X	**Vessel is not coated.**
Anodes. How many, type, condition. % consumed. Are they being replaced?				X	**No anodes.**
Internal Piping	X				**2 inch carbon steel heat medium piping – not in service. Minor surface corrosion. No mechanical damage.**
Trays How many? Type of material. Are valves in place. Check for erosion/ corrosion; wear on tray valve legs. Cleanliness?				X	**No trays.**
Baffles, deflector plates, etc. If present, describe condition. Look closely at welds attached to vessel wall.	X				**Inlet baffle intact and in place. Tight product scale with minor corrosion.**
West Head (Manway) Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				**Tight product scale. Minor corrosion. No pitting.**
East Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				**Tight product scale. Minor corrosion. No pitting.**
Shell Sections Record number of shell sections. Record location, size and depth of all erosion, corrosion or mechanical damage. Describe General condition.	X				**Two shell section in good condition.** **Heavy product scale to 50% surface area. Minor flash corrosion. No 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	**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				**Good condition. No corrosion. No pitting.**
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 at this time.**
Other	X				
NDE Inspections	X				**None at this time.**

Recommendations or corrective actions (indicate if fit for service)
Recommendations: None at this time.
Summary: This vessel is in good overall condition, visual internal carried out. Vessel is not coated. No measurable corrosion.
Vessel is fit for service.

Inspected By: Chris Maxsom **Date:** June 21, 2011

LSD Location

Site overview



Data plate

Vessel overview

Vessel overview

Base anchored securely

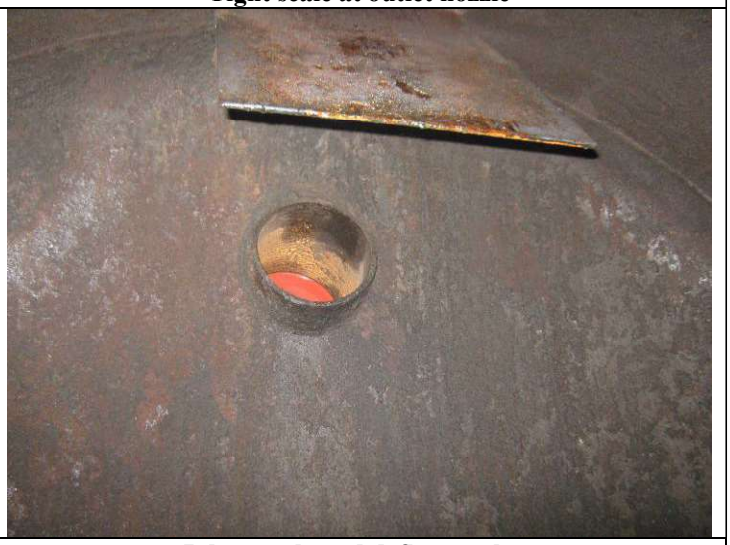
Manway

East head overview

West head overview

Tight scale at outlet nozzle

Lower shell and heat medium piping



Inlet nozzle and deflector plate