

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

**Job # 10.113190**

<b>District: Hamburg Oil – GP South</b>		<b>Skid No. 15135</b>				
<b>Facility: Hamburg Battery</b>		<b>Location (LSD): 15-21-96-10 W6M</b>				
<b>Vessel Name &amp; Equipment Number: Group Separator</b>						
<b>Orientation: Horizontal</b>						
<b>Status: In Service</b>		<b>Regulatory Inspection</b>				
<b>PRESSURE VESSEL NAMEPLATE DATA</b>						
"A" or "G" or "S" (Sask.) or BC Registration Number. <b>A0443866</b>		CRN Number <b>L 5247.2</b>				
Vessel serial number: 99C-61-05-05		Size: 54 in x 216 in				
Shell thickness: 31.8mm		Shell material: SA 516 70N				
Head thickness: 37.2mm		Head material: SA 516 70N				
Tube wall thickness:		Tube material:				
Tube diameter:		Tube length:				
Channel thickness:		Channel material:				
Design pressure	Shell: 4964 (720 psi)	Operating pressure	Shell:			
	Tubes:		Tubes:			
Design Temp.	Shell: 38°C	Operating temperature	Shell:			
	Tubes:		Tubes:			
X-ray: RT-2		Heat treatment: No				
Code parameters: ASME VIII DIV 1		Joint efficiency (if on nameplate):				
Manufacturer: Alco Gas & Oil Production Equipment		Year built: 1999				
Corrosion allowance: 1.6mm		Manway Yes				
<b>PRESSURE SAFETY VALVE NAMEPLATE DATA</b>						
Tag Number(s)	Manufacture	Model	Serial Number	Set Pressure	Capacity	Set Date
UVL 5799V/ MWS/68378	<b>Farris</b>	<b>26JA12-120</b>	<b>CE407219-1-A10</b>	<b>720psi</b>	<b>18110 scfm</b>	<b>06/2013</b>
CRN#	Serviced by	Block valve	Location	Size	Code Stamp	
<b>0G2369.5C</b>	<b>Unified Valve</b>	<b>No</b>	<b>Top Shell</b>	<b>2.5 x 4</b>	<b>UV</b>	
<b>SERVICE CONDITIONS-INDICATE ALL THAT APPLY</b>						
Sweet X	Sour	Oil X	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** \_\_\_\_\_

<b>External Inspection Items</b>	<b>G</b>	<b>F</b>	<b>P</b>	<b>N/A</b>	<b>Comments</b>
<b>Insulation</b> Verify sealed around manways, nozzles, no damage present, and there is no egress of moisture.	X				<b>Vessel is not insulated. Wall closure is sealed. No egress of moisture.</b>
<b>External Condition</b> Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)	X				<b>Paint is in good condition. No exposed metal. No damage.</b>
<b>Leakage</b> Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				<b>No leaks found.</b>
<b>Skirt/ Saddle</b> 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				<b>Saddle is bolt to steel structure. No evidence of corrosion at saddle to shell. Paint is in good condition-no exposed metal. No distortion. No buckles. Skid is welded to pilings above ground level. Ground wire is attached to saddle and to skid.</b>
<b>Anchor Bolts</b> Hammer tap to ensure secure. Look for cracking in threads or signs of deformation.	X				<b>Anchor bolts are tight and secured. No sign of deformation.</b>
<b>Concrete foundation</b> Check for cracks etc.				X	
<b>Ladder / Platform</b> Describe general condition, ensure support is secure to vessel, and describe any hazards.				X	
<b>Nozzle</b> Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted?	X				<b>Threaded nozzle joints are fully engaged. Studs fully engaged to nuts – no short bolts. Nozzles are not gusseted. No damage. No deflections. Paint in good condition – no exposed metal.</b>
<b>Gauges</b> Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.	X				<b>Gauges are visible, working and suitable for range of MAWP and temperature.</b>
<b>External Piping</b> 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				<b>Paint is in good condition – no exposed metal. Piping is well supported with clamps and supports in place. No structural overloads or deflections noted.</b>
<b>Valving</b> Ensure no leaks are visible. Valves are properly supported and chained if necessary.		X			<b>All valves are well supported. Liquid seepage at inlet control valve.</b>
<b>PSV</b> 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				<b>Located on top shell – set at MAWP of vessel. PSV seal in place. Discharge piping is same size as valve outlet. No block valve between vessel and PSV.</b>
<b>NDE methods</b> Was UT/ MPI done on vessel (MI coordinator to review results)	X				<b>Ultrasonic thickness survey carried out – no metal thickness detected below nominal minus corrosion allowance.</b>
<b>Other</b>					
<b>Recommendations or corrective actions : Vessel is Fit for Service or describe corrective actions required)</b> (MIC to review corrective actions with Operations, discuss with Chief Inspector where necessary, and get remedial action implemented) <b>Recommendations:</b> See Internal Summary <b>Summary:</b> See Internal Summary <b>Vessel is fit for service.</b>					

**Inspected By:** Chris Maxsom

**Date:** June 24, 2013

<b>Internal Inspection Items</b>	<b>G</b>	<b>F</b>	<b>P</b>	<b>N/A</b>	<b>Comments</b>
<b>Coating</b> Assess coating. Describe area coated, general condition of coating.	X				<b>Vessel is not internally coated.</b>
<b>Anodes.</b> How many, type, condition. % consumed. Are they being replaced?				X	<b>No anodes.</b>
<b>Internal Piping</b> 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	<b>No internal piping</b>
<b>Vortex Breaker</b>	X				<b>Intact and in good condition</b>
<b>Baffles, deflector plates, Weir.</b> If present, describe condition. Look closely at welds attached to vessel wall.	X				<b>The inlet baffle and deflector plates were found in good condition. No corrosion or mechanical damage.</b>
<b>Float</b> Check for restricted movement				X	<b>None.</b>
<b>East Head</b> Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				<b>No corrosion or mechanical damage</b>
<b>West Head</b> Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				<b>No corrosion or mechanical damage</b>
<b>Shell Sections</b> 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				<b>2 shell sections, found in good condition no corrosion or mechanical damage at time of inspection.</b>
<b>Demister pad</b> Is it in place? Is it clean? If any corrosion is apparent in vessel, lift pad and check top head for corrosion.	X				<b>Demister pad was found clean and in good condition at the time of inspection.</b>
<b>Welds</b> Inspect all welds, including attachment welds. Record all service-related damages and if there is any discuss with Chief Inspector before closing.	X				<b>Welds were in good condition, no corrosion or mechanical damage at time of inspection.</b>
<b>Other</b>				X	
<b>Recommendations or corrective actions (indicate if fit for service)</b> <b>Recommendations: 1. Repair liquid seepage at inlet control valve.</b> <b>Summary:</b> Vessel is in overall good condition, visual external, visual internal and ultrasonic corrosion survey performed – no metal thickness detected below nominal minus corrosion allowance. <b>Corrosion rate based on greatest thickness loss (nozzle) 0.021mm per year. Retirement Date to “T”min is year 2181.</b>  <b>Vessel is fit for service.</b>					



LSD

Overview - Skid



Overview - Vessel

Data plate



Boot

Liquid seepage at inlet control valve



Pressure gauge

Temperature gauge



PSV location – Top shell

PSV - Removed for service



PSV service tag

PSV service tag



**East head to shell weld**



**Weir plate with center temporarily removed.**



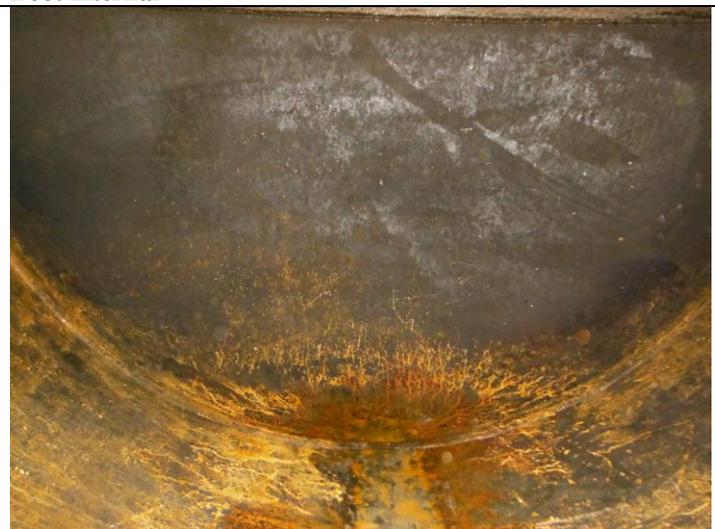
**Side shell**



**Boot internal**



**Demister pad**



**West head**