

Perilon Inspection Inc.

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VI VE MT VESSEL INSPECTION REPORT

CLIENT	CNRL 2500, 855 - 2nd Street SW Calgary, Ab T2P 4J8	A Number	A0191862
CLIENT REP	Kyle Huculak RALSTON 5-14 (1339)	Ser Number	81-7900-A
		Equipment	FREE WATER KNOCK OUT
		Inspec Date m/d/y	09/08/2015
		Facility	RALSTON 5-14 BATTERY
		LSD	05-14-018-10W4 BATTERY

Magnetic Particle Equipment

Tool: AC Hand Yoke	Model: Y-1	Indicator Black on White	Calibration: 10 lb lift
Power Source: 115 Volt	Ser No: 1074		Cal Due: 03/11/2016

Ultrasonic Equipment (0 degree)

Instrument	Ser No	Cal Due
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Probe Details

Model	Ser No	Angle	Freq	Dia	Cal Block 1	Cal Block 2

Vessel Equipment Identification

A Number	A0191862	Eq Number		Equipment	FREE WATER KNOCK OUT
Ser Number	81-7900-A	Unit		CRN	E1466.2

Observations

INTERNAL OBSERVATIONS

About 10 holidays along 6:00 shell, cleaned and Devoe 142 applied.

Water nozzle at 6:00 east end has vortex breaker cut off.

Water nozzle at 6:00 west end, vortex breaker intact, scale removed from vortex breaker. There is scale in nozzle, not accessible for cleaning. Estimate area of nozzle at 80%. Operations informed of scale.

Firetube had crack indication removed by die grinder.

Inside 1 firetube, 2 blisters, 4 inch from end of tube. Firetube removed from service.

EXTERNAL OBSERVATIONS

Good.

Recommendations


Consider changing scale inhibitor amounts.

Safety Valve Information

Shell MAWP	517	kPa	Tube MAWP	kPa
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PSV Ser No	SB54738	PSV Ser No		PSV Ser No	
PSV Tag No		PSV Tag No		PSV Tag No	
PSV Set Pres	510	kPa	PSV Set Pres		PSV Set Pres
PSV Capacity	209	GPM	PSV Capacity		PSV Capacity
PSV CRN	0G5530.5C		PSV CRN		PSV CRN
Side Protected	SHELL		Side Protected		Side Protected
Last Serv m/d/y	02/19/2015		Last Serv m/d/y		Last Serv m/d/y

Inspector Information

Inspector	Dale Toews	PESL Reg Number	00036
Signature		API 510 Number	23064
Assistant	Rob Patterson	CGSB Lev 2 UT, MT Reg Number	10498

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EXTERNAL INSPECTION ITEMS

G = Good, F = Fair, P = Poor, N/A = Not applicable

	G	F	P	NA	Comments
Insulation - Verify sealed around manways, nozzles, no damage present, and there is no egress of moisture. Are straps secure?	X				
External Condition - Assess paint condition, areas peeling, record any corrosion, damage, distortion etc (record location, size and depth of corrosion or damage)	X				
Leakage - Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				
Skirt/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. Is ground were attached? Does skirt have a hole for UT examination of bottom head?	X				
Anchor Bolts - Hammer tap to ensure secure. Look for corrosion, cracking in threads or signs of deformation.	X				
Concrete Foundation -Check for cracks, spalling, etc.				X	
Ladder/Platform - Describe general condition, ensure support is secure to vessel, describe any hazards.				X	
Nozzle VE - Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gussetted? Inspect gussets for cracking.				X	Not accessible, clad and insulated.
Gauges - Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/Temp.	X				
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				
Valving - Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				
PSV - Ensure PSV is set at pressure at or below that of vessel. Discharge piping is same size as valve outlet and is properly supported and routed. Are PSV seals in place? Ensure no block valves between PSV and vessel, or if there are that they are locked/selaed open.	X				
NDE Methods - Was UT/MPI done on vessel?				X	
Other Observations:					

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INTERNAL INSPECTION ITEMS

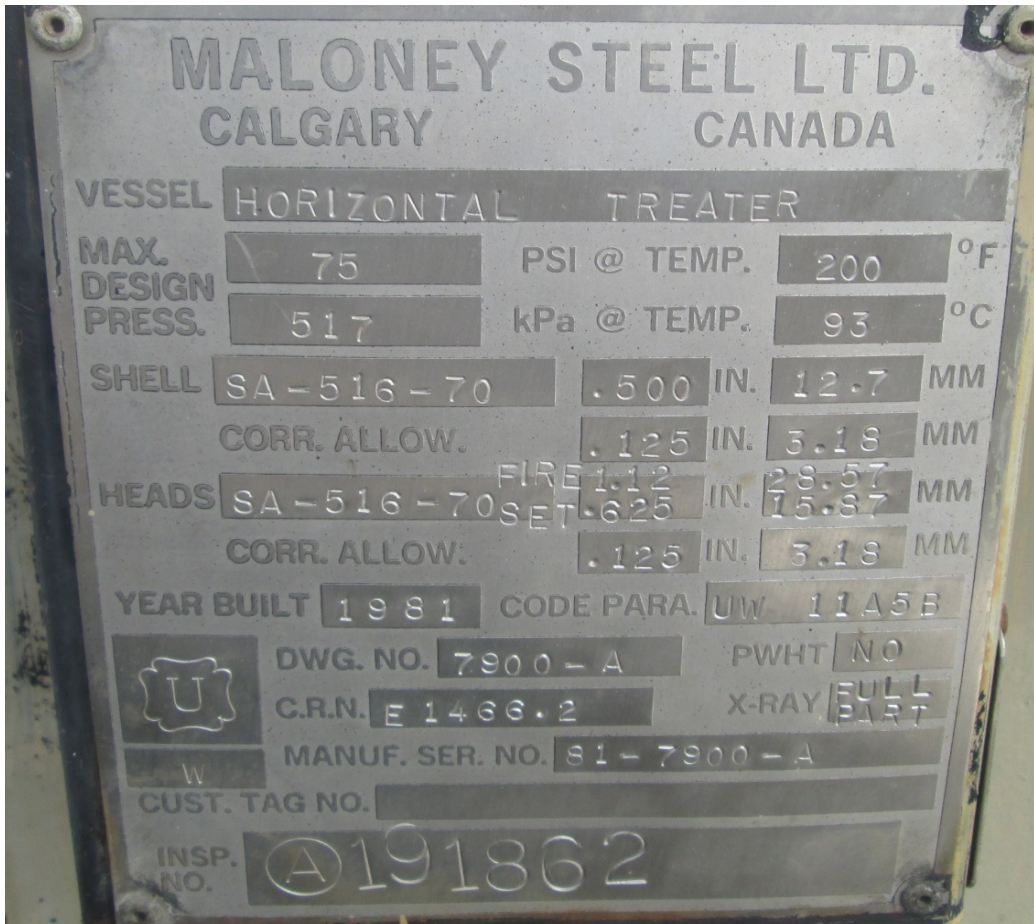
G = Good, F = Fair, P = Poor, N/A = Not applicable

	G	F	P	NA	Comments
Coating - Assess coating. Describe area coated, general condition of coating. Look at nozzles, coupling, and areas of most severe corrosion to ensure coating is intact. If coating is in poor condition make decision now if re-coating necessary? If so, when?	X				Coating generally good. About 10 hoildays in 6:00 shell, Devoe 142 applied.
Anodes - How many, type, condition. % consumed. Are they being replaced?	X				Anodes 95% remaining. Anode pigtails connected wrong, anodes electrically isolated from vessel. Crew workers
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	
Trays - How many? Type of material. Are valves in place. Check for erosion/corrosion; wear on tray, valve legs. Cleanliness?				X	
Baffles, deflector plates, etc. - If present, describe condition. Look closely at welds attached to vessel wall.	X				
Bottom Head - Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				West head good
Top Head - Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				East head good.
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				Coating generally good. About 10 hoildays in 6:00 shell, Devoe 142 applied.
Nozzle VI - Note all corrosion, erosion, or mechanical damage.	X				
Demister pad - Is it in place? Is it clean? If any corrosion is apparaent in vessel, lift pad and check top head for corrosion.				X	
Welds - Inspect all welds, including attachment welds. Record all service-related damages and if there is any discuss with Chief Inspector before closing.	X				
Repairs Required - If yes, ensure procedure and copy of AB-40 is on file, and one sent to local ABSA Inspector.				X	
NDE - Was any NDE done.			X		MT examination of firetube. Minor crack indication removed with die grinder. On inside of 1 firetube, 2 blisters, see photos. That firetube not returned to service. Vessel bypassed to continue with start up. Detaiol inspection of blisters under other Perilon report.
Other Observations:					

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Both left and right shrouds below firetubes are bent. Coating damage is limited to shroud and nozzles/anode holders. No coating damage to pressure boundary.

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Upper portion of vessel internal, coating good.



Minor holidays at 6:00 position in shell were cleaned and Devco 142 applied.

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Firetube bulge/blilster on internal diameter of firetube (coldside) at same position as tubesheet. Height of bulge/blister is about 15 mm above parent metal, thickness of tube is 12.6 mm.



Firetube bulge/blilster on internal diameter of firetube (coldside) at same position as tubesheet. Height of bulge/blister is about 4 mm above parent metal, thickness of tube is 12.6 mm.

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UVL ID#: 40233B **S N:** SB54738
Man: CONSOLIDATED **Model:** 1905-00HC-1-CC-
Set Press: 74 PSI **Capacity:** 209 US GPM
Cold Diff: **Back Press:** PSI
Size: 1.5 " 150 RF **X** 3 " 150 RF
A#: A0191862
Vessel SN:
WO#: 611882
PO#: **PO Line#**
REVISION 3 07082014 QF-067

Served By:  2/19/2015
CANADIAN NATURAL RESOURCES LIMITED
RALSTON
05-14-018-10W4M
Location: FWKO VESSEL
Cust. Id:
Cust. Ref #:
Cost Centre#:
Cust WO#

BARBER ENGINEERING & CONTROLS LTD.
CERTIFIED BY: DRESSER FLOW CONTROL CONSOLIDATED ALEXANDRIA, LOUISIANA, USA
TYPE: 1905-00HC-1-CC-MS-31-PF-LA
SIZE: 1 1/2 IN. **CRN NO:** OG55305C
SET PRESS: 74 PSI **COLD SET PRESS:** PSI
BACK PRESS: 0 PSI **TEMP:** °F
CAP: LBS. HR. SAT STEAM **STD. CU. FT. MIN. AIR**
CAP: GPM WATER **STD. CU. FT. MIN. N.G.**
TAG:
SERIAL: SB54738 **YEAR:**

REPAIRED BY:  **REPAIR**

P/N	SET PRESS. 74	PSI
S/N	BACK PRESS.	PSI
CAP	SCFM	PSI
CAP 209	GPM	PSI
ASME SECT	COLD DIFF	PSI
WFG	TEST PRESS	PSI
CRN	SERVICE TEMP	
	DATE	2/19/2015

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