

PRESSURE VESSEL INSPECTION REPORT

COMPANY		CNRL		DATE		June 28 2016		
FACILITY		Gainsborough West		LSD		13-31-02-30 W1M		
EMERALD JOB NUMBER						COMPANY IDENTIFICATION #		S4314
VESSEL DATA								
DESCRIPTION		Treater		MANUFACTURER		Kansteel		
MFG. DATE		1988		NB#/A#/S#		S#28388		
SERIAL #		4787		CRN#		A0241.342		
UNIT NUMBER(S#)		4314		STATUS		active		
MAWP SHELL	50 <input type="checkbox"/> kpa <input checked="" type="checkbox"/> psi	@ Temp 210	<input type="checkbox"/> C <input checked="" type="checkbox"/> F	MDMT	<input type="checkbox"/> C <input type="checkbox"/> F	@	<input type="checkbox"/> kpa <input type="checkbox"/> psi	
MAWP TUBE	<input type="checkbox"/> kpa <input type="checkbox"/> psi	@ Temp	<input type="checkbox"/> C <input type="checkbox"/> F		<input type="checkbox"/> C <input type="checkbox"/> F	@	<input type="checkbox"/> kpa <input type="checkbox"/> psi	
PSV INFORMATION <input type="checkbox"/> N/A <input checked="" type="checkbox"/> 2 ND PSV <input checked="" type="checkbox"/> N/A								
MANUFACTURER	Taylor	LOCATION	Top shell	MANUFACTURER		LOCATION		
SERIAL #	43106-8	CRN #	OG1315.2C	SERIAL #		CRN #		
MODEL #	T-8300-3	PSV #	7946	MODEL #		PSV #		
SET PRESSURE	50 psi	CAPACITY	1478 scfm	SET PRESSURE		CAPACITY		
INLET SIZE	3"	OUTLET SIZE	3"	INLET SIZE		OUTLET SIZE		
LAST SERVICE		SERVICE INTERVAL		LAST SERVICE		SERVICE INTERVAL		
CO. IDENT. #	6045			CO. IDENT. #				
VESSEL MATERIAL AND THICKNESS <input type="checkbox"/> N/A								
DIAMETER	72"	LENGTH	20'	CA (Tca)	none	JOINT EFFICIENCY	70%	
HEAD MATERIAL	SA 516-70	NOZZLE/PIPING MATERIAL			SHELL MATERIAL		SA 516-70	
ALLOWABLE STRESS								
NOMINAL HEAD THICKNESS (T_{nom})		0.250"		MINIMUM HEAD THICKNESS (T_{min})		0.146"		
NOMINAL NOZZLE/PIPING THICKNESS (T_{nom})				MINIMUM NOZZLE/PIPING THICKNESS (T_{min})				
NOMINAL SHELL THICKNESS (T_{nom})		0.250"		MINIMUM SHELL THICKNESS (T_{min})		0.131"		
CORROSION RATE	CML #	SHORT TERM		LONG TERM				
REMAINING LIFE (R.L.)		FIT FOR SERVICE		<input type="checkbox"/>	<input checked="" type="checkbox"/>	NOT FIT FOR SERVICE		
VESEL GROUNDED	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A	VESEL SECURED/BOLTED DOWN		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A				
NAMEPLATE LEGIBLE	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A							
VESEL REQUIRES REPAIRS	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> N/A	FUTURE ACTION REQUIRED		<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> N/A				
INTERNAL INTERVAL	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5							
EXTERNAL INTERVAL	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5							
INSPECTION METHOD	<input checked="" type="checkbox"/> VI <input checked="" type="checkbox"/> VE <input checked="" type="checkbox"/> UT <input checked="" type="checkbox"/> MPI							
Company Sign Off:				Date: 28 June 2016				
INSPECTION REQUESTED BY: Kevin Frith				INSPECTION PERFORMED BY: Neil Pinkney				

INTERNAL VISUAL INSPECTION

PRESSURE VESSEL INSPECTION REPORT

INTERNAL PROTECTION		ANODES	
<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Blistered – Light <input type="checkbox"/> Disbonded <input type="checkbox"/> Mechanical Damage <input type="checkbox"/> Coating Mills _____	<input checked="" type="checkbox"/> Coating <input type="checkbox"/> Holidays <input type="checkbox"/> Blistered – Severe <input type="checkbox"/> Chipped/Peeling <input type="checkbox"/> Mechanically Removed or Sandblasted	<input type="checkbox"/> N/A <input type="checkbox"/> Dirty <input type="checkbox"/> New/Replaced <input type="checkbox"/> Bonding Cable Attached <input type="checkbox"/> None	<input type="checkbox"/> Good Condition <input checked="" type="checkbox"/> Consumed <u>15</u> % <input type="checkbox"/> Missing
DEMISTER SCREEN/PAD		MANWAY	
<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Dislodged <input type="checkbox"/> Missing	<input type="checkbox"/> Good Condition <input type="checkbox"/> Broken <input type="checkbox"/> Fowled _____%	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Coating Damage <input type="checkbox"/> Mechanical Damage <input type="checkbox"/> Bolts Missing/Loose	<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Internal Corrosion <input type="checkbox"/> Seal Face Corrosion <input type="checkbox"/> Correct Bolting/Size/Type
FIRETUBES		TRAYS	
<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Corrosion	<input type="checkbox"/> Scaled <input type="checkbox"/> Heat Impinged <input type="checkbox"/> Dented/Distorted <input type="checkbox"/> Wear	<input type="checkbox"/> N/A <input type="checkbox"/> Collapsed <input type="checkbox"/> Loose <input type="checkbox"/> Wear <input type="checkbox"/> Poor	<input type="checkbox"/> Good Condition <input type="checkbox"/> Distorted <input type="checkbox"/> Missing <input checked="" type="checkbox"/> Corrosion <input type="checkbox"/> Holes/Short Circuiting
<input type="checkbox"/> Firetube Failure <input checked="" type="checkbox"/> MPI/UT <input type="checkbox"/> To Follow			
SHELL		VESSEL INTERNALS	
<input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input checked="" type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light	<input checked="" type="checkbox"/> Internal Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy <input checked="" type="checkbox"/> Blistered	<input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Weir/Baffle/Divider Damage <input type="checkbox"/> Downcomer Corrosion <input type="checkbox"/> See Comments	
<input type="checkbox"/> MPI/UT <input type="checkbox"/> To Follow			
HEAD		HEAD	
<input type="checkbox"/> Top <input type="checkbox"/> North <input checked="" type="checkbox"/> West <input type="checkbox"/> N/A		<input type="checkbox"/> Bottom <input type="checkbox"/> South <input checked="" type="checkbox"/> East <input type="checkbox"/> N/A	
<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> Blistered	<input type="checkbox"/> Internal Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy	<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> Blistered	<input type="checkbox"/> Internal Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy
INTERNAL PIPING			
INTERNAL PIPING	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Corrosion <input type="checkbox"/> Missing/Dents <input type="checkbox"/> Supports <input type="checkbox"/> See Comments		

**PRESSURE VESSEL INSPECTION REPORT
EXTERNAL VISUAL INSPECTION**

ACCESS & COVERAGE		SUPPORTS	
MANWAY/ACCESS SIZE	<u>18"</u> <input type="checkbox"/> N/A	VESSEL HAS	<input type="checkbox"/> Skirt <input checked="" type="checkbox"/> Legs <input type="checkbox"/> Base Plate <input type="checkbox"/> N/A
COATING	<input checked="" type="checkbox"/> Good <input type="checkbox"/> Disbonded <input type="checkbox"/> Blistered	<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Distorted <input type="checkbox"/> Broken <input type="checkbox"/> Bolts Missing/Loose/Damaged <input type="checkbox"/> Support Ring Damage <input type="checkbox"/> Skirt Access <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
<input type="checkbox"/> N/A <input type="checkbox"/> Poor Cleaning <input checked="" type="checkbox"/> Adequately Clean <input type="checkbox"/> Peeling/U.V. Damage		INSULATION	<input type="checkbox"/> Good <input type="checkbox"/> Poor <input checked="" type="checkbox"/> N/A
SHELL		NOZZLES	
<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> External Corrosion <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Dented/Distorted	<input type="checkbox"/> Insulated/Cladd <input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> Scaled – Light <input type="checkbox"/> Scaled – Severe <input type="checkbox"/> Blistered <input type="checkbox"/> See Comments	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Scaled <input type="checkbox"/> Poor Welding <input type="checkbox"/> Seal Face Corrosion <input type="checkbox"/> Internal Corrosion	<input type="checkbox"/> Cracked <input type="checkbox"/> Plugged <input type="checkbox"/> Leaking <input type="checkbox"/> Bolts Missing/Loose/Damaged
HEAD		HEAD	
<input type="checkbox"/> Top <input type="checkbox"/> North <input checked="" type="checkbox"/> West <input type="checkbox"/> N/A		<input type="checkbox"/> Bottom <input type="checkbox"/> South <input checked="" type="checkbox"/> East <input type="checkbox"/> N/A	
<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input checked="" type="checkbox"/> External Coating <input type="checkbox"/> Dented/Distorted	<input type="checkbox"/> External Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy <input type="checkbox"/> Insulated/Clad <input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> See Comments	<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input checked="" type="checkbox"/> External Coating <input type="checkbox"/> Dented/Distorted	<input type="checkbox"/> External Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy <input type="checkbox"/> Insulated/Clad <input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> See Comments
EXTERNAL PIPING			
External Piping <input type="checkbox"/> N/A Cladding/Insulation <input checked="" type="checkbox"/> N/A Supports <input type="checkbox"/> N/A Coating <input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Good Condition <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Good Condition	<input type="checkbox"/> Leaks <input type="checkbox"/> Dents/Holes <input type="checkbox"/> Missing/Stress <input type="checkbox"/> Chipped/Missing	<input type="checkbox"/> Corrosion <input type="checkbox"/> Missing <input type="checkbox"/> Corrosion <input type="checkbox"/> Corrosion
<input type="checkbox"/> See Comments <input type="checkbox"/> See Comments <input type="checkbox"/> See Comments <input type="checkbox"/> See Comments			
FIRETUBE BURNER		FIRETUBE STACK	
<input type="checkbox"/> N/A		<input type="checkbox"/> N/A	
<input type="checkbox"/> Misalignment <input type="checkbox"/> Missing <input type="checkbox"/> Not Fired <input type="checkbox"/> Requires Repair/Replacement/Combustion Analysis		<input type="checkbox"/> Corrosion/Holes <input type="checkbox"/> Poor Welding <input type="checkbox"/> Cracked <input type="checkbox"/> Requires Repair/Replacement <input type="checkbox"/> Missing	

EMERALD BOILER AND PRESSURE VESSEL INSPECTIONS INC.
PRESSURE VESSEL INSPECTION REPORT

INTERNAL VISUAL INSPECTION

DETAILED OBSERVATION (INSPECTIONS NOTES)

N/A

Treater was clean for inspections.

East (Hot) Section:

Coating is in good condition.

Firetube throat and flange is in good condition with no signs of warpage.

Spill over baffle is in place and secured, baffle shows signs of corrosion and pitting. There is visible shell corrosion at the baffle to shell interface.

All shell, head, manway, firetube and nozzle welds are in place and show no signs of corrosion or cracking.

Shell and head show no signs of dents or bulges.

Oil box is in place and secured. There is no visible signs of corrosion.

Internal piping is in place, secured and clear of all obstructions.

There may be some small hydrogen blisters in the shell close to the spill over baffle.

West Section:

There is visible hydrogen blisters on the shell, blisters range upwards of 25 mm in diameter.

Top shell at and around the inlet nozzle is corroded and pitted. UT readings show that with the T min calculation completed the shell is only good for 35 psi.

Coating is in good condition, no visible signs of failure.

Baffle is in place and shows signs of hydrogen blisters.

Bottom shell drain shows no signs of corrosion or erosion.

Cyclone is in place and secured.

Manway throat requires a coating repair.

Complete Treater:

No visible signs of shell hydrogen blisters or bulges, stress have or weld defects.

Firetube throat and flanges are in good condition with no signs of warpage or stress's.

Gas dome has not been removed at time of this inspection.

Psv, water and oil dumps have been serviced at the time of this inspection.

Firetube is in fair condition but there is corrosion and pitting on the legs and mitre externally.

RECOMMENDATIONS

N/A

EXTERNAL VISUAL INSPECTION

DETAILED OBSERVATIONS (INSPECTION NOTES)

N/A

PRESSURE VESSEL INSPECTION REPORT

Treater is clean for inspection.
Nameplate is in place, secured and legible.
Manway covers are in good condition, coating is acceptable.
Firetube stack is in good condition with no signs of holes or heavy corrosion spots.
All visible external shell, head, nozzle and manway welds are in good condition with no signs of corrosion or cracking.
There are no visible blisters, bulges or dents in the vessel.
No visible signs of leaking from the vessel or related piping.
Vessel piping is a mixture of threaded and flanged.
Treater saddles and legs are in good condition, weep holes are clear and show no signs of fluid. Legs are welded to the skid floor.
All pressure and temperature gauges are in place, secured and appear accurate.

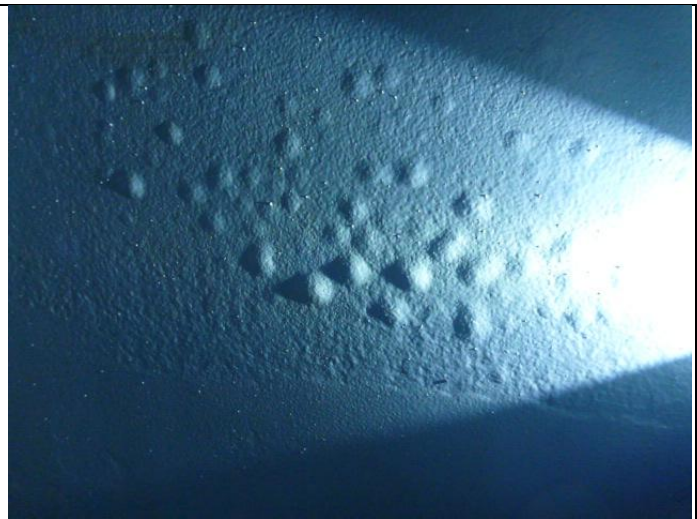
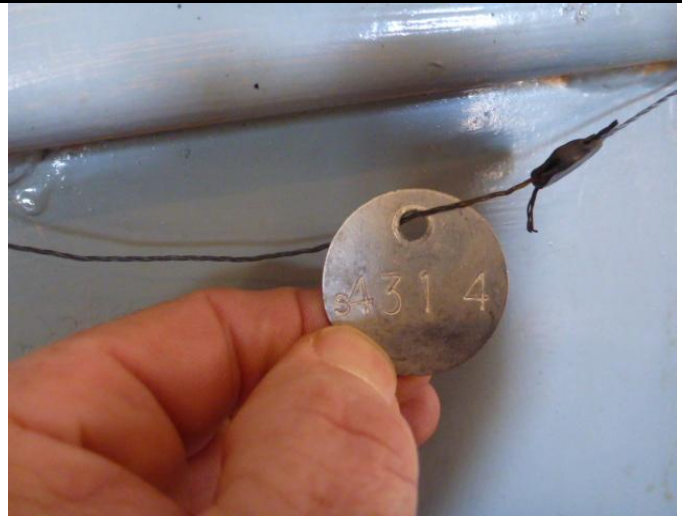
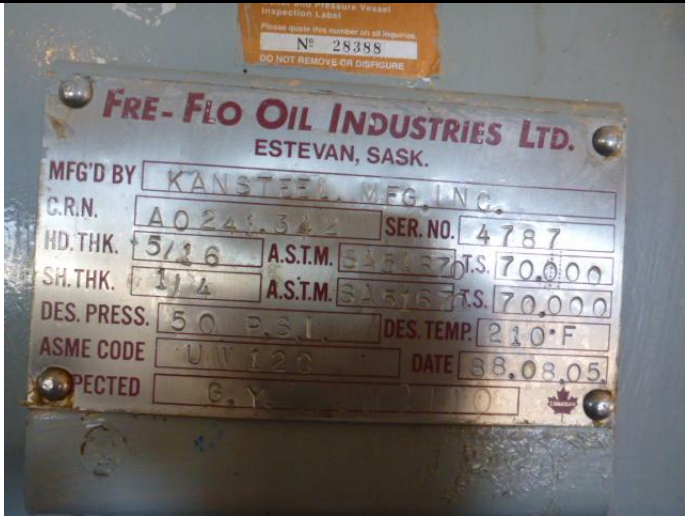
RECOMMENDATIONS

N/A

PICTURES



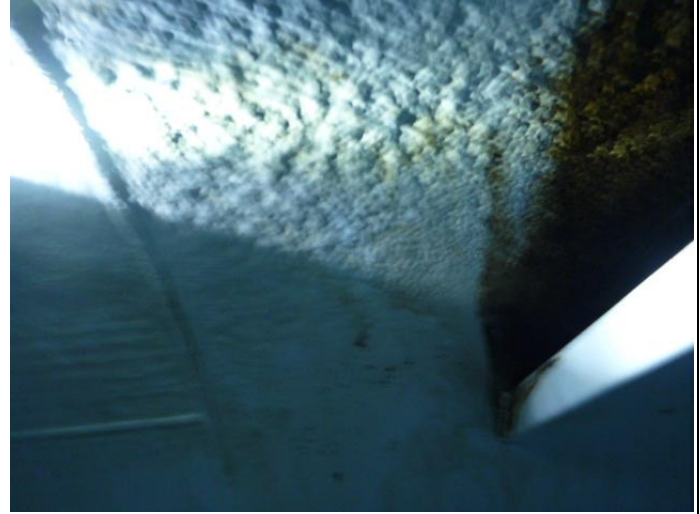
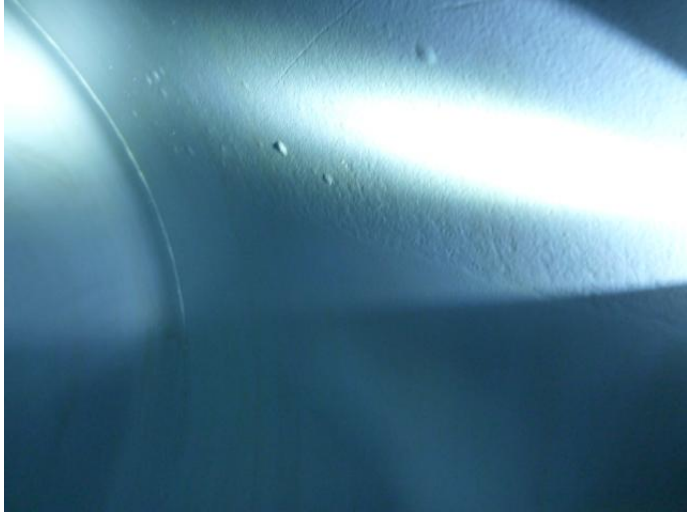
PRESSURE VESSEL INSPECTION REPORT



Spill over baffle corrosion

West section shell blisters

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PRESSURE VESSEL INSPECTION REPORT






West section shell blisters

Corroded upper shell west section



PRESSURE VESSEL INSPECTION REPORT

East section	Firetube nozzle
	
Oil box	Shell manway east section
	

Gas dome

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PRESSURE VESSEL INSPECTION REPORT



Firetube



Firetube



Firetube