



BOILER AND PRESSURE VESSEL INSPECTIONS INC.

PRESSURE VESSEL INSPECTION REPORT

COMPANY	Petrobakken	DATE	July 18 2013
FACILITY	North Handsworth	LSD	05-05-11-07 W2M
COMPANY TANK IDENTIFICATION #			

VESSEL DATA											
DESCRIPTION				Vertical treater		MANUFACTURER		Natco			
MFG. DATE				1982		NB#/A#/S#		A#191798			
SERIAL #				L-6-251		CRN#		D781.21			
DIAMETER				6'		LENGTH		27'			
UNIT NUMBER						INSP. METHOD					
MAWP SHELL	50 <input type="checkbox"/> kpa	<input checked="" type="checkbox"/> psi	@ Temp 200	<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						
PSV INFORMATION <input type="checkbox"/> N/A 2 ND PSV <input type="checkbox"/> N/A											
MANUFACTURER				LOCATION				MANUFACTURER			
SERIAL #				CRN #				SERIAL #			
MODEL #				PSV #				MODEL #			
SET PRESSURE				CAPACITY				SET PRESSURE			
INLET SIZE				OUTLET SIZE				INLET SIZE			
LAST SERVICE				SERVICE INTERVAL				LAST SERVICE			
CO. IDENT. #								CO. IDENT. #			
VESSEL MATERIAL AND THICKNESS <input type="checkbox"/> N/A											
HEAD THICKNESS		0.3125"		MATERIAL		A 285C		C.A.		n/s <input type="checkbox"/> None <input type="checkbox"/> N/A	
HEAD THICKNESS		0.3125"		MATERIAL		A 285C		R.T.		2 <input type="checkbox"/> None <input type="checkbox"/> N/A	
SHELL THICKNESS		0.250"		MATERIAL		A 285C		HT		no <input type="checkbox"/> None <input type="checkbox"/> N/A	
IS VESSEL GROUNDED				<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"/> ____					
IS VESSEL SECURED/BOLTED DOWN				<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> N/A							
NAMEPLATE SECURE				<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A		EXTERNAL INTERVAL <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> ____					
NAMEPLATE LEGIBLE				<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A							
LADDERS/HANDRAIL/WALKWAY DAMAGE				<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> N/A		INSPECTION METHOD <input checked="" type="checkbox"/> VI <input checked="" type="checkbox"/> VE <input checked="" type="checkbox"/> UT <input checked="" type="checkbox"/> mpi					
VESSEL FIT FOR SERVICE				<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A							
VESSEL REQUIRES REPAIR				<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> N/A		SIGN OFF: Neil Pinkney DATE: July 18 2013					
FUTURE ACTION REQUIRED				<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> N/A							
INSPECTION REQUESTED BY: Mike Biette						INSPECTION PERFORMED BY: Neil Pinkney					

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EXTERNAL VISUAL INSPECTION

ACCESS & COVERAGE				SUPPORTS			
MANWAY/ACCESS SIZE		16" <input type="checkbox"/> N/A		VESSEL HAS		<input checked="" type="checkbox"/> Skirt <input type="checkbox"/> Legs <input type="checkbox"/> N/A	
COATING		<input checked="" 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 checked="" 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							
SHELL				NOZZLES			
<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input checked="" type="checkbox"/> External Corrosion <input checked="" type="checkbox"/> Pitted – Light <input type="checkbox"/> Pitted – External		<input checked="" type="checkbox"/> Insulated/Cladd <input type="checkbox"/> Good <input checked="" 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 type="checkbox"/> Good Condition <input type="checkbox"/> Scaled <input type="checkbox"/> Poor Welding <input checked="" 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 checked="" type="checkbox"/> Top <input type="checkbox"/> North <input type="checkbox"/> West <input type="checkbox"/> N/A				<input checked="" type="checkbox"/> Bottom <input type="checkbox"/> South <input 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 checked="" 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 checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> External Coating		<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	
EXTERNAL PIPING							
External Piping Cladding/Insulation Supports Coating		<input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A <input 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 checked="" type="checkbox"/> Chipped/Missing	
				<input checked="" 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"/> Misalignment <input type="checkbox"/> Missing <input type="checkbox"/> Not Fired <input type="checkbox"/> Requires Repair/Replacement/Combustion Analysis <input type="checkbox"/> Firetube Failure				<input type="checkbox"/> Corrosion/Holes <input type="checkbox"/> Poor Welding <input type="checkbox"/> Cracked <input type="checkbox"/> Requires Repair/Replacement <input type="checkbox"/> Missing			

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INTERNAL VISUAL INSPECTION

INTERNAL PROTECTION		ANODES	
<input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input checked="" type="checkbox"/> Blistered – Light <input type="checkbox"/> Disbonded <input type="checkbox"/> Mechanical Damage <input type="checkbox"/> Coating Mils ____	<input checked="" type="checkbox"/> Coating <input type="checkbox"/> Holidays <input checked="" 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"/> Good Condition <input type="checkbox"/> Consumed ____% <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"/> Fowed ____%	<input type="checkbox"/> N/A <input type="checkbox"/> Coating Damage <input type="checkbox"/> Mechanical Damage <input type="checkbox"/> Bolts Missing/Loose	<input type="checkbox"/> Good Condition <input checked="" type="checkbox"/> Internal Corrosion <input checked="" type="checkbox"/> Seal Face Corrosion <input type="checkbox"/> Correct Bolting/Size/Type
FIRETUBES		TRAYS	
<input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Corrosion	<input type="checkbox"/> Scaled <input type="checkbox"/> Heat Impinged <input type="checkbox"/> Coated <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 <input type="checkbox"/> Distorted <input type="checkbox"/> Missing <input checked="" type="checkbox"/> Corrosion <input type="checkbox"/> Holes/Short Circuiting
<input type="checkbox"/> Burner Misalignment <input checked="" type="checkbox"/> MPI/UT <input checked="" 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 type="checkbox"/> Blistered	<input type="checkbox"/> N/A <input type="checkbox"/> Weir/Baffle/Divider Damage <input type="checkbox"/> Downcomer Corrosion <input type="checkbox"/> Spray Nozzle Damaged/Missing <input type="checkbox"/> See Comments	
<input type="checkbox"/> MPI/UT <input type="checkbox"/> To Follow			
HEAD		HEAD	
<input checked="" type="checkbox"/> Top <input type="checkbox"/> North <input type="checkbox"/> West <input type="checkbox"/> N/A		<input checked="" type="checkbox"/> Bottom <input type="checkbox"/> South <input type="checkbox"/> East <input type="checkbox"/> N/A	
<input type="checkbox"/> Good Condition <input checked="" type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> Internal Coating	<input checked="" type="checkbox"/> Internal Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy	<input type="checkbox"/> Good Condition <input checked="" type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> Internal Coating	<input checked="" 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		

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INTERNAL VISUAL INSPECTION

DETAILED OBSERVATION (INSPECTIONS NOTES)

☐ N/A

Treater was clean for inspection.

Gas Section:

This section is not coated.

Gas dome floor has been replaced at some time in the vessel life, floor is in good condition.

Upper shell and head has some wash and minor pitting, pit depths are 0.0200".

Gas dome shell is in fair condition with some light pitting around the gas dome floor to shell interface.

Manway throat has minor pitting and corrosion from the 3 to 9 o'clock position.

Downcomer is in place and appears to have no throughwall corrosion holes.

Internal piping is supported and in place. Internal piping is in fair condition and shows no signs of throughwall corrosion.

All support welds are in place and in good condition.

Oil Section:

Oil section is not coated.

All old hay section baffles have been removed from this treater. There is no access to this section except for the manways.

There is no active shell pitting present.

Bottom side of gas dome floor is in good condition with no signs of corrosion or cracking.

Manway throats have minor corrosion from the 3 to 9 o'clock position.

Water/firetube Section:

Section has been coated, coating is starting to fail due to blistered areas, at all failed coating locations there is visible head and shell corrosion occurring. Pit depths found at these locations are 0.090". A repair procedure has been completed and sent off to Lightstream for review and approval. Pitted areas will be baked out first and then lacwelded.

There has been lacwelding performed on the lower shell and bottom head in the past. No visible defects noted.

Firetube flange and throat has some pitting at the six o'clock position.

Firetube flange shows no signs of warpage.

Firetube:

Firetube was cleaned, sandblasted, visual mpi and ut inspected.

The internal side of the burner leg has some corrosion and pitting.

UT shows the fireside, inside of the mitre portion to have wash and corrosion. Firetube will have to be rebuilt at the next scheduled turnaround.

There are no bulges in the legs or mitre joint.

RECOMMENDATIONS

☐ N/A

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Blast and recoat the entire internal side of the treater to stop any further corrosion occurring.

EXTERNAL VISUAL INSPECTION

DETAILED OBSERVATIONS (INSPECTION NOTES)

☐ N/A

Treater is clean for inspection.

Vessel is painted. Paint is in fair condition but there is signs of coating failure.

Cladding to vessel interfaces require sealing from the weather. Cladding/vessel to building interface requires sealing from the weather.

Manway covers are in good condition, coating is not peeling or blistered. Sealing faces are in good condition.

External shell, head, manway and nozzle welds are in fair condition with no signs of cracking or stressed areas.

There is a skirt access for the external side of bottom head. Bottom head is in good condition with no signs of leaks.

External piping is a mixture of threaded and flanged.

Treater is not bolted down.

RECOMMENDATIONS

☐ N/A

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Gas section floor



Downcomer



Gas section

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Gas section top head



Firetube baffle corrosion



Oil Section



Firetube baffle

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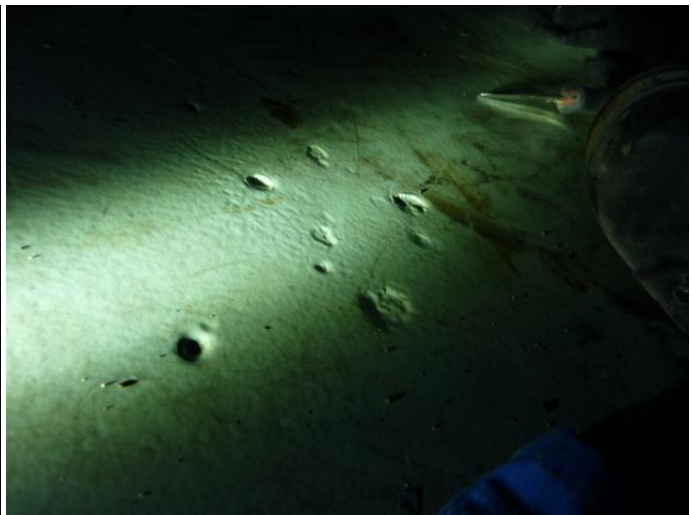


Oil section manways

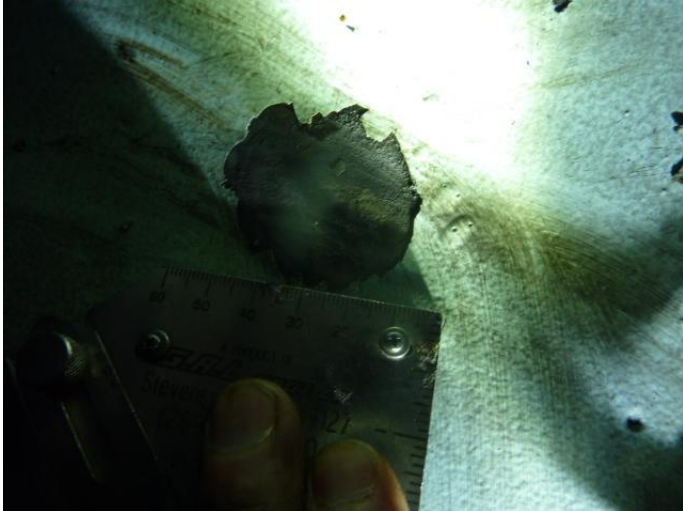
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Water section



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Bottom manway coated over pitting

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Skirt access



Bottom head