

PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: b-49-C/93-P-2

Date: June 16th, 2014

SAP Equipment ID: 66156026

VESSEL STATIC DATA						
Plant		Wolverine De-Hy		Op Unit		FH-NB-001
System				Prov. Insp. #		595438
CRN		U8368.213		Equip Tag #		
Equipment Description		L/P Flare KO Drum		Serial #		007095-01
Manufacturer		Tornado Technologies		Vessel Class		
Internal Access: NO		Description:		Year Built		2009
MAWP 50		PSI @ 212		°F		MDMT -49 °F
CODE : U		RT : 1		PWHT : YES		
Diameter		Length		OAL		mm / in
Shell	Mat'l			Thickness		Corr Allowance
Head	Mat'l			Thickness		Corr Allowance
Nozzle	Mat'l			Thickness		Corr Allowance
Internal Coating: NO		Internal Clad:		Capacity		
Manway : NO		Inspection Port :				
Nozzle Rating		ANSI		Painted : YES		Insulated: YES
PROCESS DATA						
Product Description						
Operating Pressure						
PSV STATIC DATA						
Serial No.	Location	Set Pressure	Capacity SCFM / Lbs/Hr / GPM	Manufacturer	Model / Type	Service Date

INSPECTION SUMMARY

This vessel sits elevated on steel pilings along the elevated flare line before the flare stack. The external surfaces are painted and the coating was in good visible condition. The vessel is normally insulated but the insulation was stripped so that a full UT inspection of the lower shell could be performed. Prior to this T/A, corrosion was identified on the inlet and outlet piping associated with this vessel. This piping was replaced and internally coated. This vessel is not internally coated and does not have a manway. The vessel was secured to its foundation and grounded as required. The data plate was legible and intact. The shell, heads, saddles and accessible nozzles were in good condition, with no signs of leaks, deformation or damage present at time of inspection. The vessel was isolated from service as part of the 2014 turn around. The vessel was opened and cleaned for inspection (UT and camera). Pictures were taken through the 4" inlet and outlet nozzles. Visible and active corrosion along the lower shell and inlet nozzle was visible. A 5" UT grid was done on the lower shell and thickness readings were also taken on the inlet nozzle. The lowest thickness reading taken in the scanned areas of the lower shell was 0.338" (Shell nominal 0.375"). L/T corrosion rate is 0.009"/year. Vessel was put into service in 2010.

RECOMMENDATIONS

All of the inlet and outlet piping has been internally coated, so there is a concern that corrosion may be amplified in this vessel since it is not. This vessel shall be removed from service, cleaned thoroughly and re-inspected in two years. A corrosion rate for its new service can be determined then.

NONCONFORMANCES / INSPECTION DEFICIENCIES

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INSPECTION PLANNING

Inspection Strategy	Availability	Inspection Interval
Inspection Date	Date of Last Inspect	Date of Next Inspect

REPORT CERTIFICATION

The signatures below certify that inspections/tests have been completed in accordance with the identified inspection strategy and that the specified equipment is considered fit for service until the date of next inspection.

Inspected by	Warren Fast Husky Integrity Inspector Grande Prairie District	Date	June 27, 14
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DETAILED INSPECTION VISUAL EXTERNAL

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)				
V2	General Corrosion				
V3	General Leaks				
V4	Vibration				
V5	Dissimilar Flange Rating				
V6	Ladder/Stairway				
V7	Heads	GOOD			
V8	Guy Wires				
V9	Electrical Ground	GOOD			
V10	Painted Inactive Corrosion				
V11	Coating/Painting	GOOD			
V12	Expansion Joint or Bellows				
V13	Gauge/Site Glass				
V14	Shell	GOOD			
V15	Jacket				
V21	Support Other (Please explain)				
V22	Foundation	GOOD			
V23	Anchor Bolts	GOOD			
V24	Saddle/Skirt	GOOD			
V25	Davit				
V26	Fireproofing				
V31	Connections Other (Please explain)				
V32	Small Branches				
V33	Nozzles	GOOD			
V34	Manways	GOOD			
V35	Reinforcing Pads	GOOD			
V36	Inadequate Thread Engagement				
V37	Bolting				
V38	Flanges	GOOD			
V39	Leak Clamps				
V41	Insulation Other (Please explain)				
V42	Damage				
V43	Penetrations				
V44	Insulation Jacket				
V45	Banding				
V46	Seals/Joints				
V51	Relief Devices Other (Please explain)				
V52	Corrosion				
V53	Leaks				
V54	Restricted Inlet/Outlet				
V55	Manual Operation Lever				

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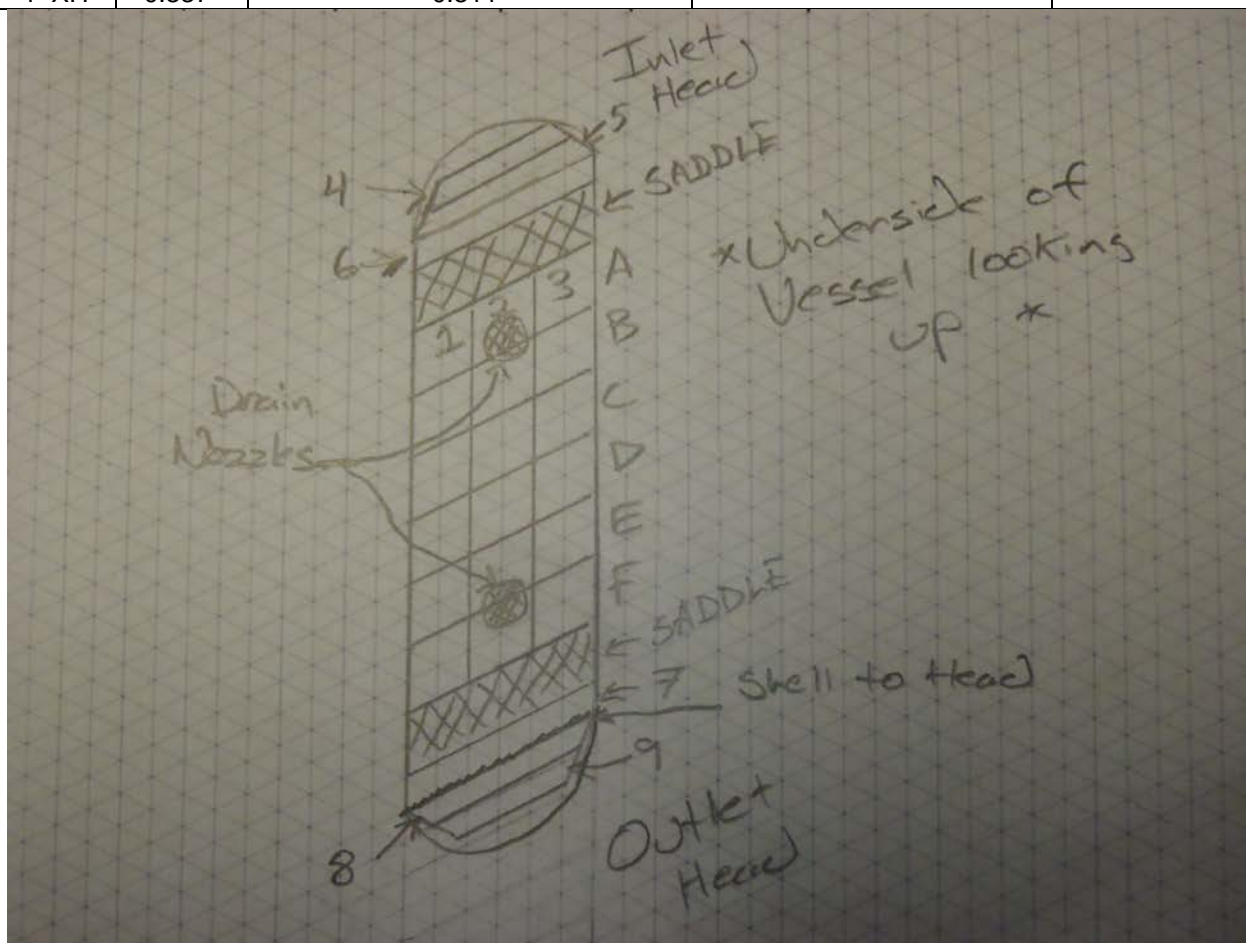
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DETAILED INSPECTION UT THICKNESS

UT THICKNESS READINGS TAKEN ON LOWER SHELL, LOWER HEADS AND INLET NOZZLE
ALL READINGS ARE THE LOWEST IN THE AREA SCANNED

AREA	NOM.	1	2	3
LOWER SHELL				
A	0.375"	0.370"	0.353"	0.355"
B	0.375"	0.356"	0.342"	0.348"
C	0.375"	0.355"	0.338"	0.360"
D	0.375"	0.362"	0.365"	0.361"
E	0.375"	0.371"	0.363"	0.361"
F	0.375"	0.372"	0.362"	0.359"
INLET HEAD				
4	0.313	0.344"		
5	0.313	0.335"		
6	0.375"	0.336"	Shell side of Shell-Head butt weld	
OUTLET HEAD				
7	0.375"	0.359"	Shell side of Shell-Head butt weld	
8	0.313	0.300"		
9	0.313	0.360"		
INLET NOZZLE				
4" XH	0.337"	0.311"		



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PHOTOS

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 W HT RT-1	CERTIFIED BY	
	TORNADO TECHNOLOGIES INC.	
	Calgary, Alberta, Canada	
	MAWP	50 PSI @ 212 °F
	MAEWP	PSI @ °F
	MDMT	-49 °F @ 50 PSI
CRN	U8380.213	Year Built 2009
Serial No.	007095-01	
<div style="border: 1px solid black; padding: 10px; text-align: center;">Ⓐ 595438</div>		
SHELL MATERIAL:	THK	0.375 in.
HEAD MATERIAL:	THK	0.3130 in.
CORROSION ALLOWANCE:	THK	0.125 in.
		

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Inlet Nozzle Side

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Inlet Nozzle

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Outlet Nozzle Side

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Looking down from Inlet Nozzle



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Picture taken with camera held inside of outlet nozzle

