

## PRESSURE VESSEL & COLUMN INSPECTION REPORT

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

Date: June 16<sup>th</sup>, 2014

SAP Equipment ID: 66156028

VESSEL STATIC DATA						
Plant		Wolverine De-Hy		Op Unit		FH-NB-001
System				Prov. Insp. #		595439
CRN		U8368.213		Equip Tag #		
Equipment Description		H/P Flare KO Drum		Serial #		007094-01
Manufacturer		Tornado Technologies		Vessel Class		
Internal Access: YES		Description: Manway		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 : YES		Inspection Port :				
Nozzle Rating		ANSI		Painted : YES		Insulated: NO
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 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 attached piping was insulated and the insulation was in good condition, with seals intact. The vessel was isolated from service as part of the 2014 turn around. The vessel was opened and cleaned for internal inspection. The internal surfaces of this vessel are not coated. There was some slight scale and general corrosion on the lower shell areas. No measurable pitting was identified at time of inspection. No other corrosion was noted at time of inspection. The deflector plates and internal piping and supports were in good condition. The manway, blind flange and nozzle were in good condition. One of the drain nozzles was full of water and could not be inspected. The other drain nozzle was clean, with visible signs of corrosion present.

This vessel is fit for service until the next scheduled inspection interval of 4 years.

### RECOMMENDATIONS

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### 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
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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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### DETAILED INSPECTION VISUAL INTERNAL

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)				
V2	Corrosion (depth, length, width)	GOOD			Minor general corrosion noted on lower shell
V3	Erosion				
V4	Distortion				
V5	Blisters				
V6	Deposits				
V7	Heads	GOOD			
V8	Welds	GOOD			
V9	Nozzles	GOOD			
V10	Shell	GOOD			
V11	Gasket Surfaces	GOOD			
V21	Internals Other (Please explain)				
V22	Demister				
V23	Baffle/Wier				
V24	Sparger				
V25	Thermowells				
V26	Metallic Linings				
V27	Nonmetallic Linings				
V28	Trays				
V29	Tray Rings				
V30	Other Welded Attachments	GOOD			Deflector plates

### DETAILED INSPECTION OTHER TECHNIQUES

ID	Location	Observation/Measurement	Acceptance Criteria	NCR	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

### DETAILED INSPECTION UT THICKNESS

CML	Nom. Thk	Current Reading	Short Term Corr Rate	Long Term Corr Rate	Remaining Life	Comments

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**PHOTOS**



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 W HT RT-1	CERTIFIED BY	
	<b>TORNADO TECHNOLOGIES INC.</b>	
	Calgary, Alberta, Canada	
	MAWP	50 PSI @ 212 °F
	MAEWP	PSI @ °F
	MDMT	-49 °F @ 50 PSI
CRN U8368.213 Year Built 2009		
Serial No. 007094-01		
 595439		
SHELL MATERIAL:	THK	0.375 in.
HEAD MATERIAL:	THK	0.3125 in.
CORROSION ALLOWANCE:	THK	0.125 in.
		



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