Canadian Natural

PRESSURE VESSEL VISUAL INSPECTION REPORT

Report #:	156732-MD-48
Inspect Date:	03/20/2012
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Insp. Co. Job #:	156732

Criticality Designation: Green

Insp. Comp:	Matrix_Inspection	District:	Grande Prairie - North	Field:	Firebird
Location:	14-01-098-08W6	Unit / Skid #:	15525	LSD:	14-01-098-08W6
Jurisdiction #:	A0502167	Equip Tag #:	N/A	Serial #:	V2580-001
CRN #:	R7294.2	Nat'l Bd #:	N/A	Year Built:	2004
Manufacturer:	IPS Manufacturing Ltd	Equipment Description:	Other: Fuel Gas Scrubber		
Status:	Out of Service - 999 -	Equip. Type:	Vessel: Separator	Service:	Sweet
MAWP Shell:	150 Psi @ 200 °F	Volume:		Code Stamp:	☒ Y ☐ N
MAWP Tube:	@	Height/Length:	60 in.	Insulated:	☐ Y ☒ N
MDMT:	-20 °F	RT: RT-2	Size/Diameter.: 16 in. O.D.	PWHT:	☐ Y ☒ N
Support	Skirt	Vessel on Original CNRL Inventory List:	☒ Y ☐ N	Manway:	☐ Y ☒ N
C.A.:	0.063 in.	Coated: N/A	Clad: N/A	J.E.: 0.90	Remote Access: ☒ - Winter Road

	Component	Material	Nominal Thk	Diameter	OD/ID	Tube Side	Shell Side
1	Main - Shell	SA-106-B	0.844 in.	16.000 in.	OD	☐	☒
2	Top - Head	SA-516-70N	0.790 in.	16.000 in.	OD	☐	☒
3	Bottom - Head	SA-516-70N	0.790 in.	16.000 in.	OD	☐	☒
4	-					☐	☐
5	-					☐	☐

Static Data: Confirmed ☐ Changed (See Comments) ☒

Comments:
Static data updated

PSV Static Data

PSV –1 Tag #:		Serial #:		CRN:	
Model #:		Capacity:		Set Pressure:	
Manufacturer:				Service Company:	
Inlet Size & Type:	-			Last Service Date:	
Outlet Size & Type:	-			Block Valve:	Upstream - Locked - Open
Carseal Intact:				Code Stamp:	
Shell Side / Tube Side:		Out for Service During Insp.:	N	Location of PSV:	

PSV –2 Tag #:		Serial #:		CRN:	
Model #:		Capacity:		Set Pressure:	
Manufacturer:				Service Company:	
Inlet Size & Type:	-			Last Service Date:	
Outlet Size & Type:	-			Block Valve:	- -
Carseal Intact:				Code Stamp:	
Shell Side / Tube Side:		Out for Service During Insp.:		Location of PSV:	

PSV Comments

No access to PSV

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External Inspection Results – VE N/A (Not Applicable)

Item	N/A	Condition	Comment (Check Status Bar or Press F1 for Help)	NCR	Action Item Integrity	Action Item Maintenance
Nameplate	☐		No External Inspection Carried Out	☐	☐	☐
Foundation and Supports	☒		No External Inspection Carried Out	☐	☐	☐
Anchor Bolts	☒		No External Inspection Carried Out	☐	☐	☐
Grounding	☒		No External Inspection Carried Out	☐	☐	☐
Insulation Condition	☒		No External Inspection Carried Out	☐	☐	☐
PSV	☒		No External Inspection Carried Out	☐	☐	☐
Shell Heads & Nozzles	☒		No External Inspection Carried Out	☐	☐	☐
Metal Surfaces (Paint)	☒		No External Inspection Carried Out	☐	☐	☐
Aux Equipment	☒		No External Inspection Carried Out	☐	☐	☐
Cathodic Protection	☒		No External Inspection Carried Out	☐	☐	☐
Alignment	☒		No External Inspection Carried Out	☐	☐	☐
Flange Connections	☒		No External Inspection Carried Out	☐	☐	☐
Pressure Gauge	☒		No External Inspection Carried Out	☐	☐	☐
Temperature Gauge	☒		No External Inspection Carried Out	☐	☐	☐
Sight Glass	☒		No External Inspection Carried Out	☐	☐	☐
Ladder / Platform	☒		No External Inspection Carried Out	☐	☐	☐
Leaks	☒		No External Inspection Carried Out	☐	☐	☐
Piping from Vessel	☒		No External Inspection Carried Out			
Previous UT Survey	☒		No External Inspection Carried Out	UT Company: N/A		

External Visual Observations

No External Inspection Carried Out

Recommendations:

No External Inspection Carried Out

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Internal Inspection Results – VI N/A (Not Applicable)

Item	N/A	Condition	Comment (Check Status Bar or Press F1 for Help)	NCR	Action Item Integrity	Action Item Maintenance
Shell	☒		No Internal Inspection Carried Out	☐	☐	☐
Heads	☒		No Internal Inspection Carried Out	☐	☐	☐
Manway	☒		No Internal Inspection Carried Out	☐	☐	☐
Gasket Surfaces	☒		No Internal Inspection Carried Out	☐	☐	☐
Welds	☒		No Internal Inspection Carried Out	☐	☐	☐
Refractory	☒		No Internal Inspection Carried Out	☐	☐	☐
Heating Coils	☒		No Internal Inspection Carried Out	☐	☐	☐
Demister Pad	☒		No Internal Inspection Carried Out	☐	☐	☐
Vane Pack	☒		No Internal Inspection Carried Out	☐	☐	☐
Baffles	☒		No Internal Inspection Carried Out	☐	☐	☐
Trays	☒		No Internal Inspection Carried Out	☐	☐	☐
Filter	☒		No Internal Inspection Carried Out	☐	☐	☐
Internal Coating	☒		No Internal Inspection Carried Out	☐	☐	☐
Tubesheet	☒		No Internal Inspection Carried Out	☐	☐	☐
Tube Bundle	☒		No Internal Inspection Carried Out	☐	☐	☐

Internal Visual Observations

No Internal Inspection Carried Out

Recommendations:

No Internal Inspection Carried Out

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Firetube Static Data N/A (Not Applicable)

Diameter: Not Applicable Nom Thickness: Not Applicable Bend: Not Applicable

Length: Not Applicable Firetube Description: Not Applicable

Firetube NDE Performed:

UT ☐	Report#: Not Applicable		ET ☐	Report#: Not Applicable	
MT ☐	Report#: Not Applicable		RT ☐	Report#: Not Applicable	
PT ☐	Report#: Not Applicable		Other ☐	Report#: Not Applicable	

Firetube Inspection Results

Item	N/A	Condition	Comment (Check Status Bar or Press F1 for Help)	NCR	Action Item Integrity	Action Item Maintenance
Burner	☒		No Firetube Inspection Carried Out	☐	☐	☐
Stack	☒		No Firetube Inspection Carried Out	☐	☐	☐
Flange (Throat)	☒		No Firetube Inspection Carried Out	☐	☐	☐
Tube Sheet	☒		No Firetube Inspection Carried Out	☐	☐	☐
Hot Side	☒		No Firetube Inspection Carried Out	☐	☐	☐
Miter	☒		No Firetube Inspection Carried Out	☐	☐	☐
Return Bend	☒		No Firetube Inspection Carried Out	☐	☐	☐
Supports	☒		No Firetube Inspection Carried Out	☐	☐	☐
Butt Welds	☒		No Firetube Inspection Carried Out	☐	☐	☐
Fillet Welds	☒		No Firetube Inspection Carried Out	☐	☐	☐

Firetube Visual Observations

No Firetube Inspection Carried Out

Recommendations:

No Firetube Inspection Carried Out

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Vessel NDE and Final Summary:

NDE Performed:					
UT ☒	Report#:		ET ☐	Report#:	
MT ☐	Report#:		RT ☐	Report#:	
PT ☐	Report#:		Other ☐	Report#:	

Maxi-Trak Observations Summary (Summarize inspection results Max 255 Characters):

Maxi-Trak Recommendations Summary (Summarize Recommendations Max 255 Characters):

Actions Corrected at Time of Inspection: (If actions were corrected at the time of Inspection – note the corrected actions here.)

Additional Visual Observations

Any other safety concerns or observations from associated equipment: (for example associated piping, buildings, pumps etc…)

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Thickness and Remaining Life Evaluation *" Must be Completed"*

MUST BE COMPLETED AND RESOLVED WITH CNRL IMMEDIATELY UPON DISCOVERY OF LOW WALL THICKNESS AREAS

Step 1: Was any thickness measurement location found to be less than (Nominal WT – Corrosion Allowance)?:

If YES, proceed to Step 2; if NO, proceed to "Crack Evaluation" and "CNRL Criticality Designation".

Step 2: Which component(s) were found below (Nominal WT – Corrosion Allowance)?

Components found below Nom - CA:

Components
-
-
-
-
-

Perform Steps 3 – 8 for each component with actual thickness less than (Nominal WT – Corrosion Allowance).

Step 3: Describe Location and Extent of Corrosion*:*

Components	Location and Extent of Corrosion
-	
-	
-	
-	
-	

Notes:

Step 4:

- For shells and nozzles, calculate minimum required thickness (T-min) as per ASME Section VIII UG-27.
- For heads, calculate minimum required thickness (T-min) as per ASME Section VIII UG-32.

Components	T-Min
-	
-	
-	
-	
-	

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Thickness and Remaining Life Evaluation *(Continued)*

Step 5: Is any measured thickness less than calculated minimum required thickness (T-min)?

If YES, complete Step 6
If NO, proceed to Step 7..

Step 6: Is nature and extent of pitting acceptable as per API 510?

Step 7: Calculate Remaining Life as per API 510. How? (Find last reading; use nominal thickness if nothing available). Short Term Corrosion Rates and Long Term Corrosion Rates.

Components	Remaining Life (Yrs)
-	
-	
-	
-	
-	

Step 8: Contact CNRL Integrity Coordinator to discuss above results.

- Name of CNRL contact:
- Date and time of conversation:

Summary/results of conversation:

Crack Evaluation by Magnetic Particle or Alternative Inspection *" Must be Completed"*

MUST BE COMPLETED AND RESOLVED WITH CNRL IMMEDIATELY UPON DISCOVERY OF CRACK-LIKE INDICATIONS

Were any indications found to suggest the vessel contained cracks?

If NO, proceed to "CNRL Criticality Designation".

If YES, Contact CNRL Integrity Coordinator to discuss results.

- Name of CNRL contact:
- Date and time of conversation:

Summary/results of conversation:

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CNRL Criticality Evaluation – *"MUST BE COMPLETED"*

The CNRL In-Service Pressure Vessel Inspector MUST answer all the following questions

1. Is the vessel fit-for-service? :
2. Was the measured thickness less than the calculated minimum required thickness (T-min) for any component?:
3. Were MT indications found?:
4. Was the remaining life less than 6 years for sour service vessels or less than 10 years for sweet service vessels?:
5. Were NCR's or Action Items generated as a result of the inspection? :
6. Were UT readings below (Nominal WT – Corrosion Allowance) found? :

Information on CNRL Owner User Program - Criticality Designation and Required Review

RED – Vessel Inspection Results are deemed RED if one of the following occurred:

- The measured thickness was less than the calculated minimum required thickness (T-min) for any component.
- MT indications were found.
- The remaining life was calculated to be less than 6 years for sour-service vessels or less than 10 years for sweet-service vessels.

RED inspection reports must be signed off by the CNRL Chief Inspector.

YELLOW – Vessel Inspection Results are deemed YELLOW if one or more of the following occurred:

- The vessel was declared NOT fit-for-service by the 3rd Party In-Service PV Inspector.
- NCR's or Action Items were generated as a result of the inspection.
- UT readings below (Nominal WT – Corrosion Allowance) were found.

YELLOW inspection reports must be signed off by the CNRL Pressure Equipment Integrity Coordinator.

GREEN – Vessel Inspection Results are deemed GREEN if all of the following are true:

- The vessel was declared fit-for-service by the 3rd Party In-Service PV Inspector.
- UT readings below (Nominal WT – Corrosion Allowance) were NOT found.
- MT indications were NOT found.
- NCR's or Action Items were NOT generated as a result of the VE inspection.

GREEN inspection reports must be signed off by the 3rd Party In-Service Pressure Vessel Inspector.

Criticality Designation

Vehicle #:	380	Kms:			
Time In:	00:00	Time Out:	00:00	Hrs	
Time In:	00:00	Time Out:	00:00	Hrs	
Personnel:					
Billing Info:	AFE :				

Inspector (Name):	Matthew B Dickinson	PESL:	601
Inspector (Signature):	Matthew Dickinson 2012.11.12 16:46:47 -07'00'	API:	39483
CNRL Coordinator (Name):			
CNRL Coordinator (Signature):			
CNRL Chief Inspector (Signature):	(I am in full agreement with report contents)		
	(I am in full agreement with report contents)		