



**PRESSURE VESSEL
VISUAL INSPECTION
REPORT**

Report #: **156732-MD-65**
Inspect Date: 03/21/2012
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Insp. Co. Job #: 156732

Criticality Designation:

Yellow

Insp. Comp: Matrix Inspection District: Grande Prairie - North Field: Firebird
Location: 14-01-098-08W6 Unit / Skid #: 16718 LSD: 14-01-098-08W6
Jurisdiction #: A2738569 Equip Tag #: HT Serial #: HT-6605
CRN #: K.5298.2 Nat'l Bd #: N/A Year Built: 1991
Manufacturer: Larsen & D'Amico Equipment Description: Other: Horizontal Treater
Status: In Service - Equip. Type: Vessel: Treater Service: Sweet
MAWP Shell: 50 Psi @ 200 °F Volume: 45 m³ Code Stamp: ☒ Y ☐ N
MAWP Tube: @ Height/Length: 30 Ft. Insulated: ☒ Y ☐ N
MDMT: 32 °F RT: RT-3 Size/Diameter.: 96 in. O.D. PWHT: ☐ Y ☒ N
Support Saddle Vessel on Original CNRL Inventory List: ☐ Y ☒ N Manway: ☒ Y ☐ N
C.A.: 1.6 mm Coated: N/A Clad: N/A J.E.: 0.85 Remote Access: ☒ - Winter Road

Component	Material	Nominal Thk	Diameter	OD/ID	Tube Side	Shell Side
1 Main - Shell	SA-516-70	7.900 mm	96.000 in.	OD	☐	☒
2 North - Head	SA-516-70	8.800 mm	96.000 in.	OD	☐	☒
3 South - Head	SA-516-70	11.430 mm	96.000 in.	OD	☐	☒
4 -					☐	☐
5 -					☐	☐

Static Data: Confirmed ☐ Changed (See Comments) ☒

Comments:

Static data updated

PSV Static Data

PSV -1 Tag #: N/A Serial #: SE-6026-1 CRN: 02176.52
Model #: JOS 15A Capacity: 3535 SCFM Set Pressure: 50 psi
Manufacturer: Crosby Service Company: Unified Valve
Inlet Size & Type: 3.00 in. - Flanged Last Service Date: 10/06/2011
Outlet Size & Type: 4.00 in. - Flanged Block Valve: --- - Carseal Missing - Open
Carseal Intact: Yes Code Stamp: Yes
Shell Side / Tube Side: Shell Side Out for Service During Insp.: N Location of PSV: On another vessel

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

There is a valve on both sides of the PSV without carseals



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External Inspection Results – VE External Inspection Performed

Item	N/A	Condition	Comment (Check Status Bar or Press F1 for Help)	NCR	Action Item Integrity	Action Item Maintenance
Nameplate	☐	Accept	Legible and firmly affixed	☐	☐	☐
Foundation and Supports	☐	Accept	welded skirt, anchored to skid	☐	☐	☐
Anchor Bolts	☐	Accept	Secure with no signs of deformation	☐	☐	☐
Grounding	☐	Accept	Grounded directly to South saddle	☐	☐	☐
Insulation Condition	☒		No insulation	☐	☐	☐
PSV	☐	Reject	Carseal missing on discharge/ suction valves	☐	☐	☒
Shell Heads & Nozzles	☐	Accept	Minor surface corrosion noted throughout	☐	☐	☐
Metal Surfaces (Paint)	☐	Accept	Chipped and flaking exposing base metal	☐	☐	☒
Aux Equipment	☒		No auxiliary equipment	☐	☐	☐
Cathodic Protection	☒		No external anode	☐	☐	☐
Alignment	☐	Accept	Vertical and upright	☐	☐	☐
Flange Connections	☐	Accept	Acceptable thread engagement	☐	☐	☐
Pressure Gauge	☐	Accept	0-100 psi: acceptable range	☐	☐	☐
Temperature Gauge	☐	Accept	0-180°F acceptable range	☐	☐	☐
Sight Glass	☐	Accept	Clear and intact	☐	☐	☐
Ladder / Platform	☒		No ladders or platforms	☐	☐	☐
Leaks	☐	No	No evidence of leaks noted	☐	☐	☐
Piping from Vessel	☐	Accept	Secure with U-bolt connections			
Previous UT Survey	☐	No	No locations marked, no history provided	UT Company: N/A		

External Visual Observations

The manway , davit arm and associated hardware are in acceptable condition

Approximately 7% of the Treater is outside the building

Dirt, dust and bird turds noted on the top section of the treater

The coating is chipped exposing the base metal to minor surface corrosion throughout the Drum

There is a valve on both sides of the PSV without carseals

A UT corrosion survey was performed at the time of inspection with no significant wall losses recorded.

Recommendations:

Clean and touch up the coating to aid in the protection against corrosion

Carseal the inlet and outlet PSV valves to ensure they are not accidentally closed



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Internal Inspection Results – VI Internal Inspection Performed

Item	N/A	Condition	Comment (Check Status Bar or Press F1 for Help)	NCR	Action Item Integrity	Action Item Maintenance
Shell	☐	Accept	Flash corrosion from washing	☐	☐	☐
Heads	☐	Accept	Coating deterioration with flash corrosion	☐	☐	☐
Manway	☐	Accept	Coating deterioration in manway	☐	☐	☐
Gasket Surfaces	☐	Accept	Serrated and good sealing surface	☐	☐	☐
Welds	☐	Accept	No recordable service damage	☐	☐	☐
Refractory	☒		Non refractory lined	☐	☐	☐
Heating Coils	☒		See firetube data	☐	☐	☐
Demister Pad	☐	Accept	Clean with no blockage evident	☐	☐	☐
Vane Pack	☒		No vane pack	☐	☐	☐
Baffles	☐	Accept	No distortion or significant corrosion noted	☐	☐	☐
Trays	☒		Removed prior to inspection	☐	☐	☐
Filter	☒		No filter	☐	☐	☐
Internal Coating	☐	Reject	Coating deterioration in hot section	☐	☒	☒
Tubesheet	☒		No tubesheet	☐	☐	☐
Tube Bundle	☒		No tube bundle	☐	☐	☐

Internal Visual Observations

An internal inspection was performed after cleaning June 7 2012

Cold section: Note: no pitting recorded in the treater

Coating deterioration noted on the attachment welds and structural steel, and on the manway.

There is an 15" long section where the coating has failed on the North Head to Shell circumferential, exposing the base metal with flash corrosion noted - no pitting

Anodes are approximately 60% eroded

There is an existing coating repair that has deteriorated and flaked exposing the base metal

Hot Section: Note: no pitting recorded in the treater

The anodes are eroded approximately 65%

Blistering and coating failure noted in the liquid to vapour section, on the roof (12 o'clock) position, heads, shells and on the manway

The demister pad was not removed because it is clean and free of any heavy product build-up

Recommendations:

Consider touch up coating repairs in the cold end
Consider recoating the hot section of the treater
Replace all anodes



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Firetube Static Data Firetube Inspection Performed

Diameter: 18 in. Nom Thickness: 0.375 in. Bend: Mitre
Length: 200 in. Firetube Description: Single U-Tube
Firetube NDE Performed: UT ☐ Report#: _____ ET ☐ Report#: _____
MT ☐ Report#: _____ RT ☐ Report#: _____
PT ☐ Report#: _____ Other ☐ Report#: _____

Firetube Inspection Results

Item	N/A	Condition	Comment (Check Status Bar or Press F1 for Help)	NCR	Action Item Integrity	Action Item Maintenance
Burner	☐	Accept	Supports are intact with no discolouration	☐	☐	☐
Stack	☐	Accept	Acceptable condition	☐	☐	☐
Flange (Throat)	☐	Accept	No notable distortion on flange	☐	☐	☐
Tube Sheet	☒		No tube sheet	☐	☐	☐
Hot Side	☐	Accept	MT examination performed no service defects	☐	☐	☐
Miter	☐	Accept	MT examination performed no service defects	☐	☐	☐
Return Bend	☒		No return bend in treater	☐	☐	☐
Supports	☐	Accept	Located inside the treater	☐	☐	☐
Butt Welds	☐	Accept	MT examination performed no service defects	☐	☐	☐
Fillet Welds	☐	Accept	MT examination performed no service defects	☐	☐	☐

Firetube Visual Observations

Minor pitting noted on the miter bend elbow, with a maximum depth recorded of 0.027"

No distortion or warpage noted in the flanges

MT examination was performed on the hot section of the firetube with no recordable service related defects noted

A UT thickness examination was performed with no significant wall losses recorded

Recommendations:

No recommendations made at the time of inspection/ examination



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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):

The coating is chipped exposing the base metal to minor surface corrosion
PSV suction and discharge valves are not carsealed
TA 2012 - Coating deteriorated in the hot section with pick-up coating repairs in the cold section
Anodes are eroded

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

Clean & touch up coating
Carseal upstream and downstream PSV valves to ensure they are not accidentally closed
TA 2012 - Consider recoating the hot section and touch-up repairs in the cold section
Replace the anodes

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

No actions were corrected at the time of inspection

Additional Visual Observations

No additional observations

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

No safety concerns noted at the time of inspection



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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)? **No**

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
N/A - N/A
N/A - N/A
N/A - N/A
N/A - N/A
N/A - N/A

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
N/A - N/A	Not Applicable for this Inspection
N/A - N/A	Not Applicable for this Inspection
N/A - N/A	Not Applicable for this Inspection
N/A - N/A	Not Applicable for this Inspection
N/A - N/A	Not Applicable for this Inspection

Notes:

Not Applicable for this Inspection

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
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A



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Thickness and Remaining Life Evaluation (Continued)

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

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

Step 6: Is nature and extent of pitting acceptable as per API 510? **N/A**

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)
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A
N/A - N/A	N/A

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

- Name of CNRL contact: Not Applicable for this Inspection
- Date and time of conversation: Not Applicable for this Inspection

Summary/results of conversation:
Not Applicable for this Inspection

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? **N/A**

If NO, proceed to “CNRL Criticality Designation”.

If YES, Contact CNRL Integrity Coordinator to discuss results.

- Name of CNRL contact: Not Applicable for this Inspection
- Date and time of conversation: Not Applicable for this Inspection

Summary/results of conversation:
Not Applicable for this Inspection

Equipment Photographs:



01 nameplate



02 overview



03 overview outside



04 coating deterioration



05 surface corrosion



06 dirt, dust & bird turds



07 PSV overview



08 missing carseal



09 missing carseal

Equipment Photographs:



10 blisters & flash corrosion



11 blisters in liquid to vapour section



12 head around manway



13 coating deterioration on manway



14 previous coating repair damage



15 eroded anode



16 roof coating failure



17 shell to attachment weld



18 weir plate



19 demister overview



20 coating repairs



21 popped blisters from wash



22 cold section manway



23 coating repairs



24 anode cold section



25 flash corrosion on base metal



26 attachments coating deterioration



27 blistering



28 north head to shell circ seam



29 firetube overview



30 firetube miter bend