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

✓ - Winter Road C.A.: 1.6 mm Coated: N/A OD/ID Tube Side Component Material Nominal Thk Diameter Shell Side SA-516-70 7.900 mm 96.000 in. OD Main - Shell \boxtimes 2 North - Head SA-516-70 OD \boxtimes 8.800 mm 96.000 in. South - Head SA-516-70 11.430 mm 96.000 in. OD \boxtimes 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 #: CRN: Serial #: Model #: Set Pressure: Capacity: Manufacturer: Service Company: Last Service Date: Inlet Size & Type: 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		anchored to skid				
Anchor Bolts		Accept		no signs of deformation				
Grounding		Accept	Grounded directly to South saddle					
Insulation Condition	\boxtimes		No insulation	•				
PSV		Reject	Carseal miss	ing on discharge/ suction valve	es			\boxtimes
Shell Heads & Nozzles		Accept	Minor surface	corrosion noted throughout				
Metal Surfaces (Paint)		Accept	Chipped and	flaking exposing base metal				\boxtimes
Aux Equipment	\boxtimes		No auxiliary e	equipment				
Cathodic Protection	\boxtimes		No external a	node				
Alignment		Accept	Vertical and u	ıpright				
Flange Connections		Accept	Acceptable th	read engagement				
Pressure Gauge		Accept	0-100 psi: ac	ceptable range				
Temperature Gauge		Accept	0-180°F acce	ptable range				
Sight Glass		Accept	Clear and into	act				
Ladder / Platform	\boxtimes		No ladders or					
Leaks		No		of leaks noted				
Piping from Vessel		Accept		J-bolt connections				
Previous UT Survey		No	No locations	marked, no history provided	UT C	ompan	y: N/A	
External Visual Observations	;							
The manway , davit arm and associated hardware are in acceptable condition								
Approximately 7% of the T	reate	er is outside t	the building					
Dirt, dust and bird turds no	ted c	n the top se	ction of the tre	ater				
The coating is chipped exp	osin	g the base m	netal to minor s	surface corrosion throughout th	ne Drum			
There is a valve on both si	des d	of the PSV w	ithout carseals	S				
A UT corrosion survey was	s perf	ormed at the	e time of inspe	ction with no significant wall lo	sses rec	orded.		
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)		NCF	Action Item Integrity	Action Item Maintenance	
Shell		Accept	Flash corrosion	n from washing			
Heads		Accept	Coating deterior	oration with flash corrosion			
Manway		Accept	Coating deterior	oration in manway			
Gasket Surfaces		Accept	Serrated and g	good sealing surface			
Welds		Accept No recordable service damage					
Refractory			Non refractory lined				
Heating Coils			See firetube da	ata			
Demister Pad		Accept	Clean with no l	blockage evident			
Vane Pack			No vane pack				
Baffles		Accept	No distortion o	r significant corrosion noted			
Trays			Removed prior	to inspection			
Filter			No filter				
Internal Coating		Reject	Coating deterior	oration in hot section			
Tubesheet		,	No tubesheet				
Tube Bundle			No tube bundle	 e			
		I	I				
Internal Visual Observa							
An internal ispection	was perfor	med after cl	eaning June 7 2	2012			
Cold section: Note: n	o pitting re	corded in th	e treater				
Coating deterioration	noted on t	he attachme	ent welds and st	tructural steel, and on the m	anway.		
			ing has failed or	n the North Head to Shell ci	rcumferinal, exp	osing the base	e metal with
flash corrosion noted	l - no pittino	9					
Anodes are approxin	nately 60%	eroded					
There is an existing of	coating rep	lair that has	deteriorated an	d flaked exposing the base	metal		
Hot Section: Note: no	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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Insp. Co. Job #: LSD: 14-01-098-08W6 A2738569 Insp. Company: Matrix_Inspection Jurisdiction #: Firetube Static Data Firetube Inspection Performed Nom Thickness: 0.375 in. Bend: Mitre Diameter: 18 in. Length: 200 in. Firetube Description: Single U-Tube UT 🔲 Report#: ET \square Report#: Firetube NDE RT 🗌 MT \square Report#: Report#: Performed: PT 🗌 Other Report#: Report#: Firetube Inspection Results Action Item Action Item Comment N/A Condition **NCR** Item (Check Status Bar or Press F1 for Help) Integrity Maintenance Burner П Accept Supports are intact with no discolouration Acceptable condition Stack Accept Flange (Throat) Accept No notable distortion on flange Ш Ш **Tube Sheet** M No tube sheet П П П Hot Side П MT examination performed no service defects П Accept Miter MT examination performed no service defects Accept Return Bend \boxtimes No return bend in treater П Supports П 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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10-1-1-11						
Insp. Company:	Matrix_Inspection	LSD:	14-01-098-08W6		Jurisdiction #:	A2738569
Vessel NDE and Final	UT ⊠ Report#		ET RT Other		Report#: Report#: Report#:	
Maxi-Trak Observation	s Summary (Summarize	inspection resu	Its Max 255 Character	rs):		
PSV suction and disc TA 2012 - Coating de Anodes are eroded	ed exposing the base me charge valves are not car eteriorated in the hot sect	sealed ion with pick-up	o coating repairs in the			
Maxi-Trak Recommend	dations Summary (Summ	arize Recomme	endations Max 255 Ch	aracte	ers):	
· ·	ating d downstream PSV valve ecoating the hot section		•		d	
Actions Corrected at T	ime of Inspection: (If action	ns were corrected a	t the time of Inspection – not	te the c	orrected actions here.)	
No actions were corr	ected at the time of inspe	ction				
Additional Visual Obse	rvations					
No additional observations						
Any other safety conce	rns or observations from	associated equ	ipment: (for example	assoc	ciated piping, buildings,	pumps etc)
No safety concerns r	noted at the time of inspe	ction				



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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.

I -IVIIN
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

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

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

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



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CNRL Criticality Evaluation – "MUST BE COMPLETED"

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

- Is the vessel fit-for-service? : Yes
- 2. Was the measured thickness less than the calculated minimum required thickness (T-min) for any component?: No
- 3. Were MT indications found?: **N/A**
- 4. Was the remaining life less than 6 years for sour service vessels or less than 10 years for sweet service vessels?: **No**
- 5. Were NCR's or Action Items generated as a result of the inspection? : Yes
- 6. Were UT readings below (Nominal WT Corrosion Allowance) found?: No

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.

Critica	lity Designation	Yellow
Vehicle #:	380 Kms:	Inspector (Name): Matthew B Dickinson PESL: 601
Time In:	00:00 Time Out: 00:00 Hrs	Inspector (Signature): Matthew Dickinson 2012.11.13 API: 39483 08:10:35 -07'00'
Time In:	00:00 Time Out: 00:00 Hrs	CNRL Coordinator (Name):
Personnel:	JD, LP	CNRL Coordinator (Signature):
Billing Info:	AFE :	CNRL Chief Inspector (Signature): (I am in full agreement with report contents)
		(I am in full agreement with report contents)



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Equipment Photographs:



01 nameplate



02 overview



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03 overview outside



04 coating deterioration

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05 surface corrosion



06 dirt, dust & bird turds

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07 PSV overview



08 missing carseal

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09 missing carseal

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Equipment Photographs:



10 blisters & flash corrosion



11 blisters in liquid to vapour section

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12 head around manway



13 coating deterioration on manway

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14 previious coating repair damage



15 eroded anode

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16 roof coating failure

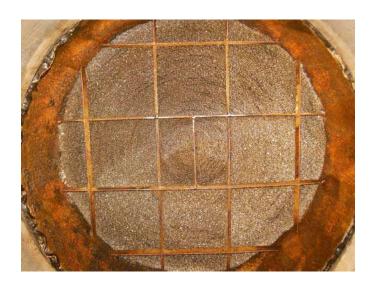


17 shell to attachment weld

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18 weir plate



19 demister overview

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20 coating repairs



21 popped blisters from wash

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22 cold section manway



23 coating repairs

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24 anode cold section



25 flash corrosion on base metal

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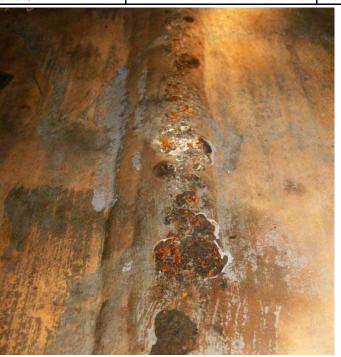
26 attachments coating deterioration



27 blistering



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28 north head to shell circ seam



29 firetube overview



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30 firetube miter bend