



PRESSURE VESSEL
VISUAL INSPECTION
REPORT

Report #: **156960-MD-04**
Inspect Date: 10/15/2012
Page: 1 of 12
Insp. Co. Job #: 156960

Criticality Designation:



Green

Insp. Comp: Matrix Inspection District: Grande Prairie - North Field: Hamburg
 Location: 12-29-096-11W6 Unit / Skid #: Plant 1 LSD: 12-29-096-11W6
 Jurisdiction #: A0218888 Equip Tag #: V-403 Serial #: 85-9413-A-3
 CRN #: F-4788.2 Nat'l Bd #: N/A Year Built: 1985
 Manufacturer: Maloney Steel Equipment Description: Other: Gas Dehydrator
 Status: Out of Service - 888 - Equip. Type: Vessel: Tower Service: Sweet
 MAWP Shell: 1400 Psi @ 650 °F Volume: N/A Code Stamp: Y N
 MAWP Tube: @ Height/Length: 28.5 Ft. Insulated: Y N
 MDMT: -20 °F RT: RT-1 Size/Diameter.: 66 in. I.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.: N/A Remote Access: -

Component	Material	Nominal Thk	Diameter	OD/ID	Tube Side	Shell Side
1 Main - Shell	SA-516-70	2.937 in.	66.000 in.	ID	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2 Top - Head	SA-516-70	2.729 in.	66.000 in.	ID	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3 Bottom - Head	SA-516-70	2.729 in.	66.000 in.	ID	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4 -					<input type="checkbox"/>	<input type="checkbox"/>
5 -					<input type="checkbox"/>	<input type="checkbox"/>

Static Data: Confirmed Changed (See Comments)

Comments:

Static data confirmed

PSV Static Data

PSV -1 Tag #: N/A Serial #: TG77503 CRN: 01832.568312
 Model #: 1924FT-1 Capacity: 8665 SCFM Set Pressure: 1400 psi
 Manufacturer: Consolidated Service Company: N/A
 Inlet Size & Type: 1.50 in. - Flanged Last Service Date: N/A
 Outlet Size & Type: 2.00 in. - Flanged Block Valve: N/A - -
 Carseal Intact: Yes Code Stamp: Yes
 Shell Side / Tube Side: Shell Side Out for Service During Insp.: N Location of PSV: On 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

Due for service
Disconnected from discharge piping



**PRESSURE VESSEL
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Report #: **156960-MD-04**
 Inspect Date: 10/15/2012
 Page: 2 of 12
 Insp. Co. Job #: 156960

Insp. Company: Matrix_Inspection LSD: 12-29-096-11W6 Jurisdiction #: A0218888

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	<input type="checkbox"/>	Accept	Legible with one broken rivet	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Foundation and Supports	<input type="checkbox"/>	Accept	Welded skirt anchored to skid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anchor Bolts	<input type="checkbox"/>	Accept	Secure with minor surface corrosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grounding	<input type="checkbox"/>	Accept	Grounded directly to South East side of skirt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insulation Condition	<input checked="" type="checkbox"/>		No insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PSV	<input type="checkbox"/>	Reject	Overdue service & discharge piping disconnected	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Shell Heads & Nozzles	<input type="checkbox"/>	Accept	Minor surface corrosion through out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metal Surfaces (Paint)	<input type="checkbox"/>	Accept	Chipped and flaking exposing base metal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Aux Equipment	<input checked="" type="checkbox"/>		Not applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cathodic Protection	<input checked="" type="checkbox"/>		No external anode	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alignment	<input type="checkbox"/>	Accept	Vertical and upright	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flange Connections	<input type="checkbox"/>	Accept	Adequate thread engagement and hardware	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pressure Gauge	<input checked="" type="checkbox"/>		No pressure gauge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temperature Gauge	<input checked="" type="checkbox"/>		No temperature gauge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sight Glass	<input checked="" type="checkbox"/>		No sight glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ladder / Platform	<input type="checkbox"/>	Accept	All 4 platforms are secure with cages for ladders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leaks	<input type="checkbox"/>	No	No evidence of leaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Piping from Vessel	<input type="checkbox"/>	Reject	PSV discharge to header piping is disconnected			
Previous UT Survey	<input type="checkbox"/>	Yes	Locations marked, no history provided	UT Company: N/A		

External Visual Observations

At the time of inspection the dehydrator was not in service and the 6" inlet was blinded

The coating is flaking and chipped throughout exposing the base metal to minor surface corrosion with no evidence of pitting.

There are two 24" manways on the vessel with adequate hardware and thread engagement

The nameplate has one broken rivet

All platforms and ladders are secure with well supported cages on the ladders

The PSV is overdue for service and the discharge to piping flange connection is disconnected

There is mechanical damage noted thru out the surfaces on the middle shell, (it appears as a tooling marks from erection)

There is also mechanical damage on the top head below the paint

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

Recommendations:

Secure PSV piping
 Service, replace PSV
 Secure the nameplate
 Clean and touch up the coating to aid in the protection against corrosion

If this vessel is to be moved and/or placed into service the lifting lugs and top nozzle should be MT examined as well as ABSA document AB-10 completed



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Report #: **156960-MD-04**
 Inspect Date: 10/15/2012
 Page: 3 of 12
 Insp. Co. Job #: 156960

Insp. Company: Matrix_Inspection LSD: 12-29-096-11W6 Jurisdiction #: A0218888

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	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heads	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manway	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gasket Surfaces	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Welds	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Refractory	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heating Coils	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demister Pad	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vane Pack	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Baffles	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trays	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Filter	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Internal Coating	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tubesheet	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tube Bundle	<input checked="" type="checkbox"/>		No Internal Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Internal Visual Observations

No Internal Inspection Carried Out

Recommendations:

No Internal Inspection Carried Out



**PRESSURE VESSEL
VISUAL INSPECTION
REPORT**

Report #: **156960-MD-04**
 Inspect Date: 10/15/2012
 Page: 4 of 12
 Insp. Co. Job #: 156960

Insp. Company: Matrix Inspection LSD: 12-29-096-11W6 Jurisdiction #: A0218888

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	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stack	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flange (Throat)	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tube Sheet	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hot Side	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Miter	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Return Bend	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supports	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Butt Welds	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fillet Welds	<input checked="" type="checkbox"/>		No Firetube Inspection Carried Out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Firetube Visual Observations

No Firetube Inspection Carried Out

Recommendations:

No Firetube Inspection Carried Out



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VISUAL INSPECTION
REPORT

Report #: **156960-MD-04**
Inspect Date: 10/15/2012
Page: 5 of 12
Insp. Co. Job #: 156960

Insp. Company: Matrix Inspection LSD: 12-29-096-11W6 Jurisdiction #: A0218888

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):

Coating deteriorated exposing base metal to surface corrosion
PSV past due for service and discharge piping is disconnected
Nameplate rivet broken

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

Secure PSV piping and service or replace
Clean and touch up the coating to aid in the protection against corrosion
Secure nameplate

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

Old hornets nests inside skirting

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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Inspect Date: 10/15/2012
Page: 6 of 12
Insp. Co. Job #: 156960

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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
Top - Inlet Nozzle
Top - Head
- Shell
Bottom - Head
Bottom - Drain Nozzle

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:

Circumferential stress used for nozzles

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
Top - Inlet Nozzle	0.166
Top - Head	2.66
- Shell	2.773
Bottom - Head	2.66
Bottom - Drain Nozzle	0.237



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REPORT

Report #: **156960-MD-04**
Inspect Date: 10/15/2012
Page: 7 of 12
Insp. Co. Job #: 156960

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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)
Top - Inlet Nozzle	99
Top - Head	99
- Shell	99
Bottom - Head	99
Bottom - Drain Nozzle	99

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



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REPORT**

Report #: **156960-MD-04**
 Inspect Date: 10/15/2012
 Page: 8 of 12
 Insp. Co. Job #: 156960

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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? : **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? : **No**
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.

Criticality Designation



Green

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

Inspector (Name): Matthew B Dickinson PESL: 601
 Inspector (Signature): _____
Inspector Signature
06/30/2010 08:43:20 am
 API: 39483
 CNRL Coordinator (Name): _____
 CNRL Coordinator (Signature): _____
Coordinator Signature
06/30/2010 08:44:03 am
 CNRL Chief Inspector (Signature): _____
 (I am in full agreement with report contents)
Chief Inspector Signature
06/30/2010 08:45:39 am
 (I am in full agreement with report contents)

Equipment Photographs:



01 nameplate



02 broken nameplate rivet



03 overview



04 surface corrosion



05 paint deterioration



06 surface corrosion



07 surface corrosion top head



08 disconnected PSV