



**PRESSURE VESSEL  
VISUAL INSPECTION  
REPORT**

Report #: **FIS002-WF-37**  
 Inspect Date: 04/11/2010  
 Page: 1 of 9  
 Insp. Co. Job #: FIS002

**Criticality Designation:**



**Yellow**

Insp. Comp: Fusion Inspection District: Lloydminster Heavy Oil Field: Rush Lake  
 Location: 03-30-048-23W3 Unit / Skid #: \_\_\_\_\_ LSD: D03-30-048-23W3  
 Jurisdiction #: A3008898 Equip Tag #: S27227 Serial #: V-2124-1  
 CRN #: M4500-23 Nat'l Bd #: \_\_\_\_\_ Year Built: 1994  
 Manufacturer: OPSCO Equipment Description: Other: VERTICAL SEPARATOR  
 Status: In Service - Equip. Type: Vessel: Separator Service: Sweet  
 MAWP Shell: 1475 Psi @ 100 °F Volume: \_\_\_\_\_ Code Stamp:  Y  N  
 MAWP Tube: \_\_\_\_\_ Psi @ \_\_\_\_\_ °F Height/Length: 5 Ft. Insulated:  Y  N  
 MDMT: -20 °F RT: RT-2 Size/Diameter.: 24.00 in. PWHT:  Y  N  
 Support: Skirt Vessel on Original CNRL Inventory List:  Y  N Manway:  Y  N  
 C.A.: 0.062 in. Coated: \_\_\_\_\_ Clad: \_\_\_\_\_ J.E.: \_\_\_\_\_ Remote Access:  - \_\_\_\_\_

Component	Material	Nominal Thk	Diameter	OD/ID	Tube Side	Shell Side
1 Main - Shell	UNKNOWN	1.125 in.	24.000 in.	OD	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2 Top - Head	UNKNOWN	1.070 in.	24.000 in.	OD	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3 Bottom - Head	UNKNOWN	1.070 in.	24.000 in.	OD	<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:

Changed numbers - Height/Length

**PSV Static Data**

PSV -1 Tag #: \_\_\_\_\_ Serial #: 9610-39 CRN: OG1316.2C  
 Model #: T-8200-1 Capacity: 5181 SCFM Set Pressure: 1400 psi  
 Manufacturer: Taylor Valve Service Company: Noralta Controls  
 Inlet Size & Type: 1.00 in. - Threaded Last Service Date: Oct 29.2003  
 Outlet Size & Type: 1.00 in. - Threaded Block Valve: - -  
 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**

- The PSV is in good condition with the carseal intact. The PSV is overdue for servicing.



**PRESSURE VESSEL  
VISUAL INSPECTION  
REPORT**

Report #: **FIS002-WF-37**  
 Inspect Date: 04/11/2010  
 Page: 2 of 9  
 Insp. Co. Job #: FIS002

Insp. Company: Fusion Inspection LSD: D03-30-048-23W3 Jurisdiction #: A3008898

**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		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foundation and Supports	<input type="checkbox"/>	Accept		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anchor Bolts	<input type="checkbox"/>	Accept		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grounding	<input type="checkbox"/>	Reject	Install ground wire	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Insulation Condition	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PSV	<input type="checkbox"/>	Reject	The PSV is overdue for servicing.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Shell Heads & Nozzles	<input type="checkbox"/>	Accept		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metal Surfaces (Paint)	<input type="checkbox"/>	Reject	Paint deteriorating throughout	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Aux Equipment	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cathodic Protection	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alignment	<input type="checkbox"/>	Accept		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flange Connections	<input type="checkbox"/>	Accept		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pressure Gauge	<input type="checkbox"/>	Accept	25 psi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temperature Gauge	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sight Glass	<input type="checkbox"/>	Accept		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ladder / Platform	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leaks	<input type="checkbox"/>	No		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Piping from Vessel	<input type="checkbox"/>	Accept	Paint deteriorating throughout, light corrosion present			
Previous UT Survey	<input type="checkbox"/>	No		UT Company:		

**External Visual Observations**

- The vessel was operating at time of inspection. No process leaks or vibrations were noted.
- The ground wire from the skid for the vessel is present; however it has not been installed into the ground.
- The PSV is in good condition with the carseal intact. The PSV is overdue for servicing.
- The paint is deteriorating on isolated areas of the shell and throughout the piping with light corrosion and scale present on the piping and flanges.
- The skirt is secure and level.
- External UT was performed with no significant wall losses noted. UT was carried out with GE DMS 2 SN: 0221JR.
- Refer to the attached photos, UT data and drawing for details.

**Recommendations:**

- Install the ground wire into the ground at the required depth.
- Service the PSV.
- Clean and paint the vessel to assist surface condition.



**PRESSURE VESSEL  
VISUAL INSPECTION  
REPORT**

Report #: **FIS002-WF-37**  
 Inspect Date: 04/11/2010  
 Page: 3 of 9  
 Insp. Co. Job #: FIS002

Insp. Company: Fusion Inspection LSD: D03-30-048-23W3 Jurisdiction #: A3008898

**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 #: **FIS002-WF-37**  
 Inspect Date: 04/11/2010  
 Page: 4 of 9  
 Insp. Co. Job #: FIS002

Insp. Company: Fusion Inspection LSD: D03-30-048-23W3 Jurisdiction #: A3008898

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



PRESSURE VESSEL  
VISUAL INSPECTION  
REPORT

Report #: **FIS002-WF-37**  
Inspect Date: 04/11/2010  
Page: 5 of 9  
Insp. Co. Job #: FIS002

Insp. Company: Fusion Inspection LSD: D03-30-048-23W3 Jurisdiction #: A3008898

**Vessel NDE and Final Summary:**

UT  Report#: FIS002-UT-WF-37 ET  Report#: \_\_\_\_\_  
NDE Performed: MT  Report#: \_\_\_\_\_ RT  Report#: \_\_\_\_\_  
PT  Report#: \_\_\_\_\_ Other  Report#: \_\_\_\_\_

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

- The ground wire from the skid for the vessel is present; however it has not been installed into the ground.
- The PSV is in good condition with the carseal intact. The PSV is overdue for servicing.

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

- Install the ground wire into the ground at the required depth.
- Service the PSV.
- Clean and paint the vessel to assist surface condition.

**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...)**



**PRESSURE VESSEL  
VISUAL INSPECTION  
REPORT**

Report #: **FIS002-WF-37**  
 Inspect Date: 04/11/2010  
 Page: 6 of 9  
 Insp. Co. Job #: FIS002

Insp. Company: Fusion Inspection LSD: D03-30-048-23W3 Jurisdiction #: A3008898

**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



PRESSURE VESSEL  
VISUAL INSPECTION  
REPORT

Report #: **FIS002-WF-37**  
Inspect Date: 04/11/2010  
Page: 7 of 9  
Insp. Co. Job #: FIS002

Insp. Company: Fusion Inspection LSD: D03-30-048-23W3 Jurisdiction #: A3008898

**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? **No**

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



PRESSURE VESSEL VISUAL INSPECTION REPORT

Report #: FIS002-WF-37
Inspect Date: 04/11/2010
Page: 8 of 9
Insp. Co. Job #: FIS002

Insp. Company: Fusion Inspection LSD: D03-30-048-23W3 Jurisdiction #: A3008898

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? : No
2. Was the measured thickness less than the calculated minimum required thickness (T-min) for any component?: No
3. Were MT indications found?: No
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.

Criticality Designation



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

Inspector (Name): Wes Farquhar PESL: 462
Inspector (Signature): [Signature] Digitally signed by Wes Farquhar Date: 2010.11.25 14:32:54 -07'00' API: 29669
CNRL Coordinator (Name): Carson Petersen
CNRL Chief Inspector (Signature): (I am in full agreement with report contents)



**Equipment Photographs:**



**Figure 001\_Nameplate**



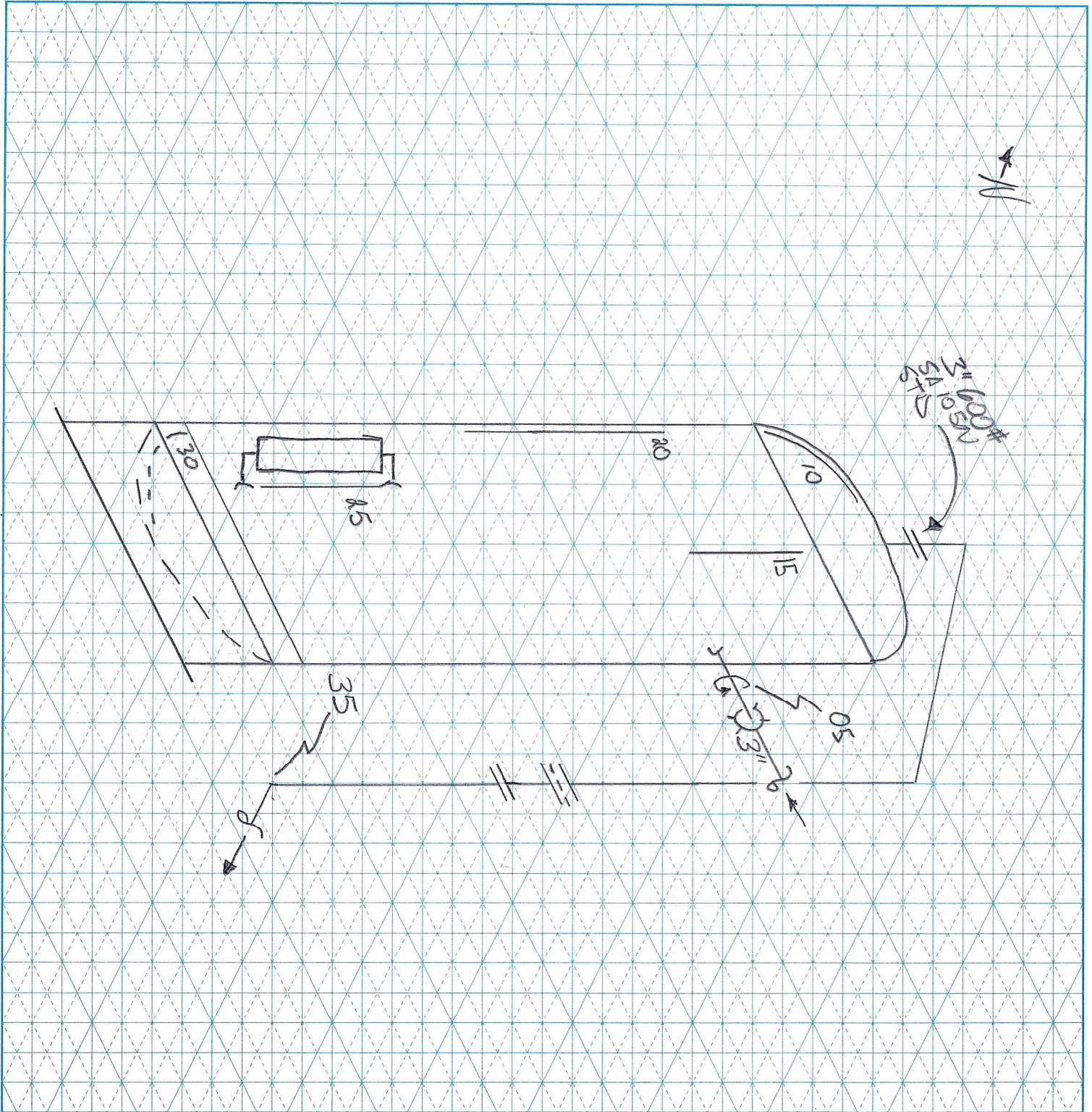
**Figure 002\_Vertical Separator**



**Figure 003\_Corrosion on Piping Flanges**



**Figure 004\_Ground Wire Present-Grounding Post Required**



REG. NO. A3009898    EQP. NO. S 27227    S/N V-2124-1    EQP. DESC. VERTICAL SEPARATOR  
 CODE/STAMP U    CRN M4500.23    DIA. (ID/OD) 24"    YEAR BUILT 1994    SERVICE SWEET  
 MANUFACTURER OPSCO    HEIGHT/LENGTH 5'    RT RT-2    J.E. \_\_\_\_\_

HEAD		SHELL		CHANNEL HEAD	
Top/N/S/E/W Mat _____	Nom <u>1.070"</u>	Mat _____	Nom (top) <u>1.125"</u>	Shell Mat _____	Nom _____
Btm/N/S/E/W Mat _____	Nom <u>1.070"</u>	Corr. All. <u>0.0625</u>	Nom (btm) _____	Head Mat _____	Nom _____
MAWP Shell Side <u>1475 PSI</u>	@ MAWT <u>100°F</u>	PWHT <u>U</u>	MDMT <u>-20</u>	MAWP Tube Side _____	@ MAWT _____



### **Row 1 Legend**

TML=Thickness measurement location (Scanned Bands)

PNT 1=Minimum thickness recorded in band (Red = Thickness is below nominal minus C.A.)

PNT 2=Maximum thickness recorded in band

PNT 3=Average thickness recorded in band

SOD=Scanning orientation & direction

LOM=Location of minimum thickness relative to the start of band

#### **SOD Column Legend -1st Entry (Scan Orientation)**

H=Horizontal band

V=Vertical band

C=Circumferential band

#### **SOD Column Legend -2nd & 3rd Entry (Scan Direction)**

T=Top

B=Bottom

N=North

S=South

E=East

W=West

#### **LOM Column Legend**

SOB=Start of band

EOB=End of Band

Knuckle=Within the knuckle of a pressure vessel head