Canadian Natural

PRESSURE VESSEL VISUAL INSPECTION REPORT

Report #:	123938-DB-32
Inspect Date:	09/18/2010
Page:	1 of 10
Insp. Co. Job #:	123938

Criticality Designation: Yellow

Insp. Comp:	Matrix_Inspection	District:	St Albert	Field:	Joffre
Location:	04-10-039-26W4	Unit / Skid #:	N/A	LSD:	04-10-039-26W4
Jurisdiction #:	A3127069	Equip Tag #:	N/A	Serial #:	50612-200
CRN #:	M9934.2	Nat'l Bd #:	N/A	Year Built:	1995
Manufacturer:	NUSCO MANUFACTURING &	Equipment Description:	Other: SEPARATOR		
Status:	In Service -	Equip. Type:	Vessel: Separator	Service:	Sweet
MAWP Shell:	740 Psi @ 100 °F	Volume:	N/A	Code Stamp:	☒ Y ☐ N
MAWP Tube:	@	Height/Length:	144.00 in.	Insulated:	☐ Y ☒ N
MDMT:	-20 °F	RT: RT-2	Size/Diameter.:	48.00 in.	PWHT: ☐ Y ☒ N
Support	Skirt	Vessel on Original CNRL Inventory List:	☒ Y ☐ N	Manway:	☐ Y ☒ N
C.A.:	N/A 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-516-70N	1.125 in.	48.000 in.	OD	☐	☒
2	Top - Head	SA-516-70N	1.125 in.	48.000 in.	OD	☐	☒
3	Bottom - Head	SA-516-70N	1.125 in.	48.000 in.	OD	☐	☒
4	-					☐	☐
5	-					☐	☐

Static Data: Confirmed ☒ Changed (See Comments) ☐

Comments:
Nameplate is secure and legible.
Adequate information stated.

PSV Static Data

PSV –1 Tag #:	PSV3127069	Serial #:	SE-12507-1	CRN:	0201.2
Model #:	991107MA	Capacity:	7255 SCFM	Set Pressure:	720 psi
Manufacturer:	Crosby			Service Company:	Powercomm
Inlet Size & Type:	1.50 in. - Threaded			Last Service Date:	9/7/2005
Outlet Size & Type:	1.50 in. - Threaded			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

PSV is overdue for service.

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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	Nameplate is secure and legible.	☐	☐	☐
Foundation and Supports	☐	Accept	Foundation and supports in fair/good condition	☐	☐	☐
Anchor Bolts	☐	Accept	Anchor bolts in place and secure.	☐	☐	☐
Grounding	☐	Accept	Ground is attached, clean and secure.	☐	☐	☐
Insulation Condition	☒		Not applicable for this inspection.	☐	☐	☐
PSV	☐	Reject	PSV is overdue for service.	☐	☐	☒
Shell Heads & Nozzles	☐	Accept	Shell, Heads and Nozzles in good condition.	☐	☐	☐
Metal Surfaces (Paint)	☐	Accept	Metal surfaces and paiont in good condition.	☐	☐	☐
Aux Equipment	☒		Not applicable for this inspection.	☐	☐	☐
Cathodic Protection	☒		Not applicable for this inspection.	☐	☐	☐
Alignment	☐	Accept	Vessel alignment is good.	☐	☐	☐
Flange Connections	☐	Accept	Flange connections proper, in good condition.	☐	☐	☐
Pressure Gauge	☐	Accept	Pressure gauge appears functional.	☐	☐	☐
Temperature Gauge	☐	Accept	Temperature gauge appears functional.	☐	☐	☐
Sight Glass	☐	Accept	Sight glass is clear and in good condition.	☐	☐	☐
Ladder / Platform	☒		Not applicable for this inspection.	☐	☐	☐
Leaks	☐	No	No leaks noted at time of inspection.	☐	☐	☐
Piping from Vessel	☐	Accept	Piping well supported and in good condition.			
Previous UT Survey	☐	Yes	Evidence of previous inspection.	UT Company: Aitec		

External Visual Observations

Vessel and it's associated components in good external condition.
* PSV is overdue for service.
Nameplate is secure and legible.
Foundation and supports in fair/good condition
Anchor bolts in place and secure.
Ground is attached, clean and secure.
Shell, Heads and Nozzles in good condition.
Metal surfaces and paiont in good condition.
Vessel alignment is good.
Flange connections proper, in good condition.
Pressure gauge appears functional.
Temperature gauge appears functional.
Sight glass is clear and in good condition.
No leaks noted at time of inspection.
Piping well supported and in good condition.

Recommendations:

Service the PSV and attach a tag.

Insp. Company: Matrix_Inspection LSD: 04-10-039-26W4 Jurisdiction #: A3127069

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

Insp. Company: Matrix_Inspection LSD: 04-10-039-26W4 Jurisdiction #: A3127069

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

Insp. Company: Matrix_Inspection LSD: 04-10-039-26W4 Jurisdiction #: A3127069

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):

Vessel and it's associated components in good external condition.

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

Have PSV serviced and attach a tag. Continue to inspect at regular intervals.

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

Not applicable for this inspection.

Additional Visual Observations

Not applicable for this inspection.

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

Not applicable for this 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

Insp. Company: Matrix_Inspection LSD: 04-10-039-26W4 Jurisdiction #: A3127069

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

Insp. Company: Matrix_Inspection LSD: 04-10-039-26W4 Jurisdiction #: A3127069

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? : ***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				Yellow		

Vehicle #: 321 Kms:

Time In: 00:00 Time Out: 00:00 Hrs

Time In: 00:00 Time Out: 00:00 Hrs

Personnel: Mike Schmidt

Billing Info: :

Inspector (Name): Dennis Bowlby PESL:

Inspector (Signature): Dennis Bowlby CN = Dennis Bowlby, C = CA, O = Matrix 2010.11.08 14:27:50 -07'00' API: 34104

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)

Equipment Photographs:

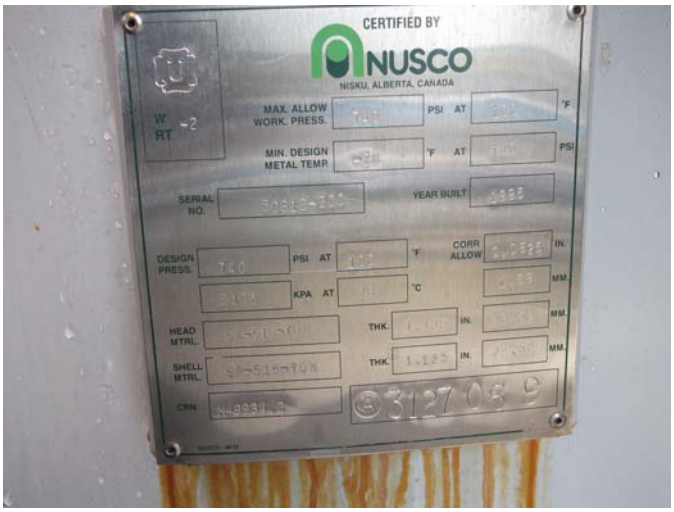

Figure_001_Nameplate

Figure_002_Overview

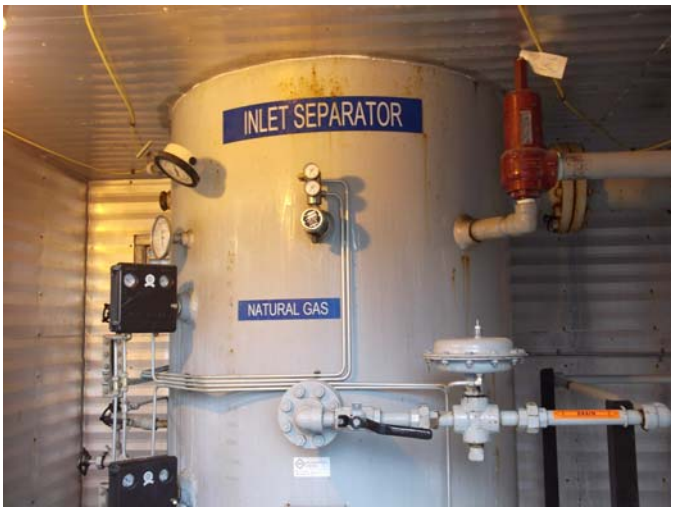

Figure_003_Overview

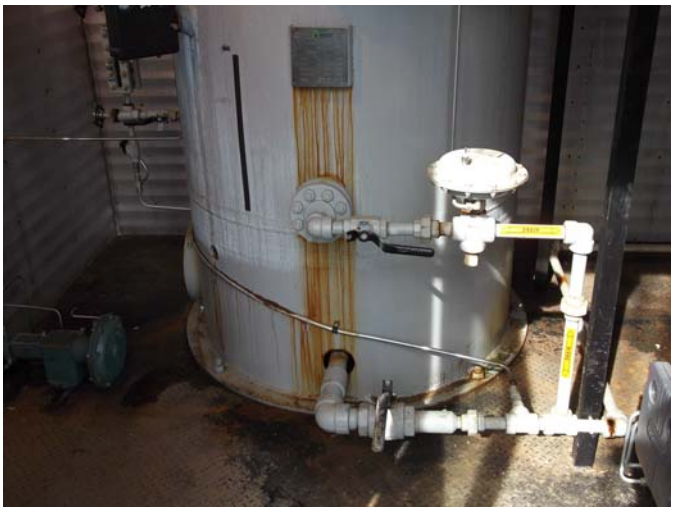

Figure_004_Shell oxidization.

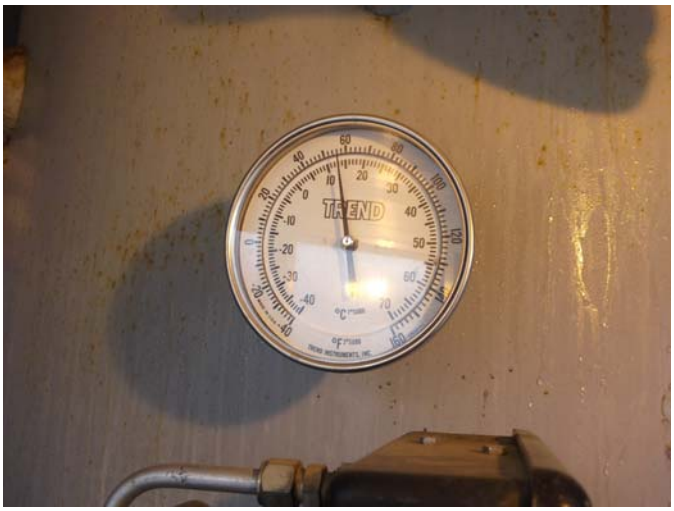

Figure_005_Temperature gauge

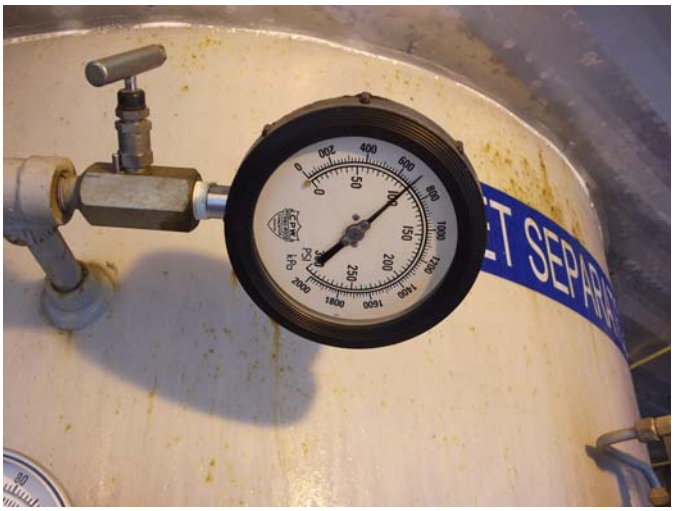

Figure_006_Pressure gauge

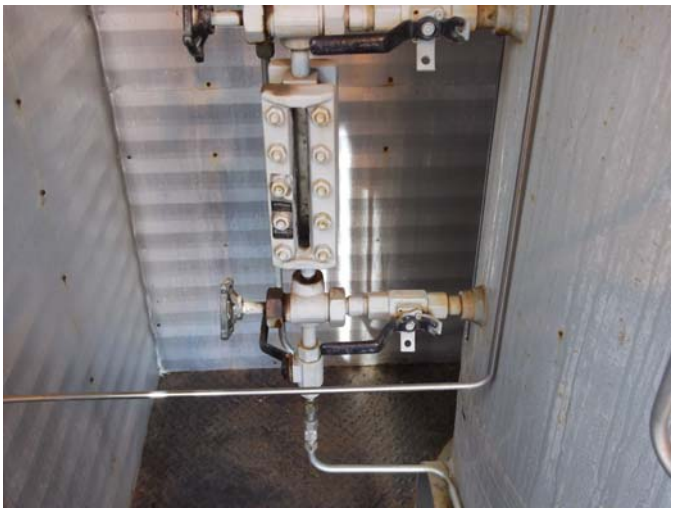

Figure_007_Liquid level

Figure_008_Anchor bolting