

INSPECTION REPORT



Pressure Vessel Survey			
Location:	Point Tupper	EM&I Report No.:	PT-D2006-090512-DM-R0
Client Name:		Client Ref No.:	PT-11564905-002-D2006
Client Rep.:		Inspector Name:	Doug MacDonald
WO No.:		Inspection Date:	May 12, 2009
SPO No.:		System:	Propane + Liquids
Workscope No.:	PT-2009-D2006-INT-01	EM&I Job No:	EMJ0132.43
Tag No.:	D2006	Equipment Description:	Off-Spec Storage Vessel D-2006
Date of Last Inspection:	NA	Previous Records Seen:	NA
Drawing No.:	LA-B22-F-22-8006-01-Z4, 98-CA-399735-1D-5		

Inspection Summary					
Item	Condition				Comments
	Good	Fair	Poor	NA	
External Ladders, Access and Support Structure					Internal Only
1. If applicable, check ladders, stairways, platforms and walkways that are connected to, or bearing on the vessel for signs of corrosion, missing components, or deterioration.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. If applicable, check vessel supports for signs of deterioration, settlement, deflection, and/or corrosion.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. If applicable, check coatings for signs of deterioration, rusts spots, cracks, blistering, and/or coating disbondment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. a) For horizontally mounted vessels, check for signs of trapped moisture, resulting in corrosion between cradle support and vessel shell.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) For vertically mounted vessels on skirt support or support legs, check for condensation, resulting in corrosion on the bottom cap/ inside skirt support surface or area of attachment of the support legs to the bottom cap.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Check the grounding connection is correctly installed, with cable connections tight and ground wires in good condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6. Check all bolted connections for any signs of corrosion or mechanical damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7. If applicable, check the vessel sliding foot free to move and hold-down bolts are free.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Vessel External Surfaces	Good	Fair	Poor	NA	
1. Check permanent identifying tags on vessel are legible and present the required information.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See Photo 2 and Note 1
2. If applicable, check that all bolts/studs extend fully through their nuts, having a protrusion beyond the nut of not less than one thread; flange bolts have bolt heads all on the side of the joint.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. If applicable, check bolted connections are in full contact with connected elements and connections for any signs of rust, corrosion or mechanical damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. If applicable, check insulation support bands and clips for signs of corrosion or breakage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Check all welded seams and connections for any signs of deterioration, corrosion, cracking, pitting or other sign of failure. Specify.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6) If applicable, check insulation type, condition for any insulation damage and ingress of water. Record insulation type.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7. Carry out visual inspection of the exterior surface of the vessel, including coatings for any signs of leaks, cracks, deformation, distortion, pitting, corrosion or other forms of deterioration. If so, specify type, location and extent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8. If applicable, check weep holes in reinforcement plates are not plugged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
External Piping / Instrument Attachments	Good	Fair	Poor	NA	
1. If applicable, check vessel trim, such as gauges, sight glasses, valves and other appurtenances, show signs of deterioration, or missing components, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. If applicable, check if the PSV on the vessel is in calibration. Record tag number of PSV and calibration date.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Inspect fittings, nozzles and other connections, including the surrounding vessel shell / head for any signs of distortion or cracks, wall loss, leakage, deterioration of coatings, etc. Specify extent and location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

INSPECTION REPORT



Inspection Summary					
Item	Condition				Comments
	Good	Fair	Poor	NA	
Vessel Internal Surfaces					
1. Check for signs of corrosion, erosion, cracks, blisters, pitting, distortion, or other forms of deterioration on the internal vessel surfaces. If any, specify type, location and extent.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Overall vessel interior good condition. See Note 2 and Photos 3-5.
2. Check all welded joints for any signs of deterioration, corrosion, cracking, pitting or other sign of failure. Specify.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Weld seams in good condition based on CVI. MPI used to check weld seams as well. One discontinuity found in circ. weld seam. See Note 3 and attached MPI report. See also Photos 10-12.
3. Check all man-ways, nozzles and connections for distortion, cracks, corrosion, wall loss and other type of defects or failures. If any defects are noted, specify type, extent and location.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nozzles in bottom of vessels inspected via CVI. MPI also used to verify good condition and absence of discontinuity. See Photos 13-16
4. If applicable, compare the results of performed wall thickness survey with previous reports for areas of wall thickness loss. Identify areas on inspection report.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	UT survey done for external inspection report
5. Where applicable, check vessel internal cladding for signs of bulging, buckling, cracks, holes, etc. If any, specify type, location and extent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No internal cladding.
6. Where applicable, check the vessel internal coating for signs of deterioration, such as: rust spots, blisters, coating disbandment, etc. If any, specify type, location and extent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No internal coating
7. If possible, check gasket seals on all flanges for signs of corrosion and/or mechanical damage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Internal Equipment/Piping /Supports					
1. Where applicable, check supports for vessel's internal equipment and components for signs of corrosion, distortion and deterioration.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Vortex breaker good condition.
2. If applicable, check vessel's internals for signs of corrosion, distortion and deterioration, missing components etc.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Vortex breaker good condition.
3. If applicable, check if bolted connections are in full contact with connected elements and connections are free from rust or other deleterious material that may prohibit full contact.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No internal bolted connections.

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings

INSPECTION REPORT



Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings

Note 1:

Designed and Engineered by
Patterson Industries Canada Limited
Scarborough (Toronto) Ontario Canada
Made in Canada
Serial No. 986A9735D

Certified by Trenergy Inc.
Max Allowable W.P. : 1724/-62 KPag (250/-9 PSIG)
at Temp 65 C (149 F)
Min Design Metal Temp: -27 C (-16.6 F)
at Pressure: 1724/-62 KPag (250/-9 PSIG)
Serial No. 065
CRN: 9096.8
Year Built: 1999
D-2006 Offspec Storage Vessel
Department of Labour Identification No. 007981

Note 2:

Internal surfaces of vessel generally in good condition exhibiting just light surface corrosion and mill scale. Some minor pitting was discovered in the bottom of the vessel between the 4 and 7 o'clock positions and between the 1st and 3rd circumferential weld seams north of the vortex breaker (see details in photos 7-9). All pitting was less than the specified shell corrosion allowance of 1.6 mm.

Note 3:

Every second circumferential weld seam was checked for discontinuities using MPI. The full seam from 3 through 9 o'clock positions was tested. Just one discontinuity was noted at the 3rd weld seam from the south head at approximately the 4 o'clock position (see Photo10). Blend grinding was subsequently used to feather out the edge of the weld and remove the discontinuity. A subsequent MPI test verified the removal of the discontinuity (see Photo 11). A UT measurement indicated the grinding did not remove more than 1mm of material, hence the wall thickness remains within the corrosion allowance. See also attached MPI report.

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings



Photo 1 – Overall view of vessel D2006 – North end with manway.



Photo 2 – Name plate manufacturer.



Photo 3 – Vessel internal south head above nozzle N2



Photo 4 – Vessel internal north head adjacent to manway.

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings



Photo 5 – Overall view internal vessel from north end manway looking south.



Photo 6 – Overall view internal vessel from north end manway looking south.

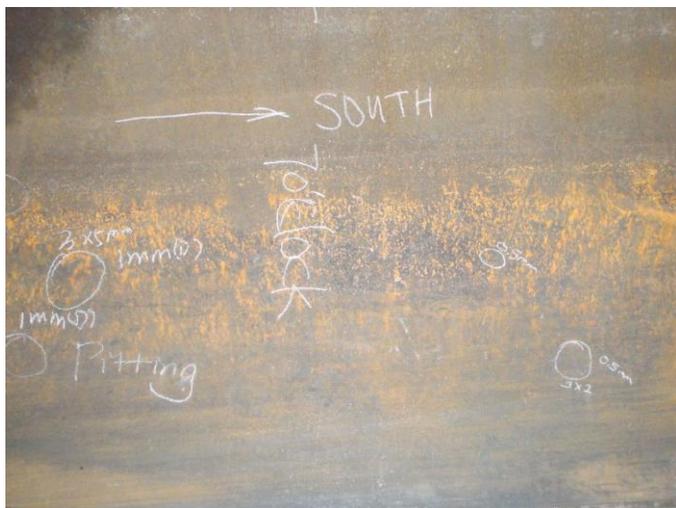


Photo 7 – Overall view of scatter pits. - 6-7 o'clock. 3x5 mm and 0.5 to 1.0mm deep.

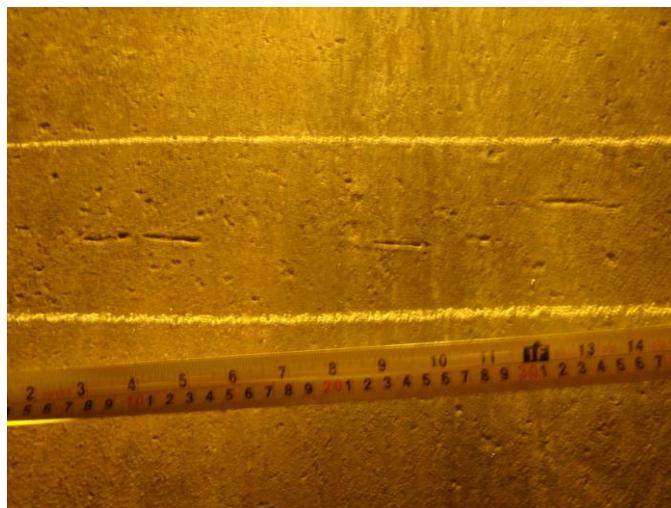


Photo 8 – Overall view of pitting at 6 o'clock with circumferential orientation.

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings



Photo 9 – Isolated pitting at 6 o'clock.



Photo 10 – Typical weld seam. Tee intersection of longitudinal and circumferential welds.

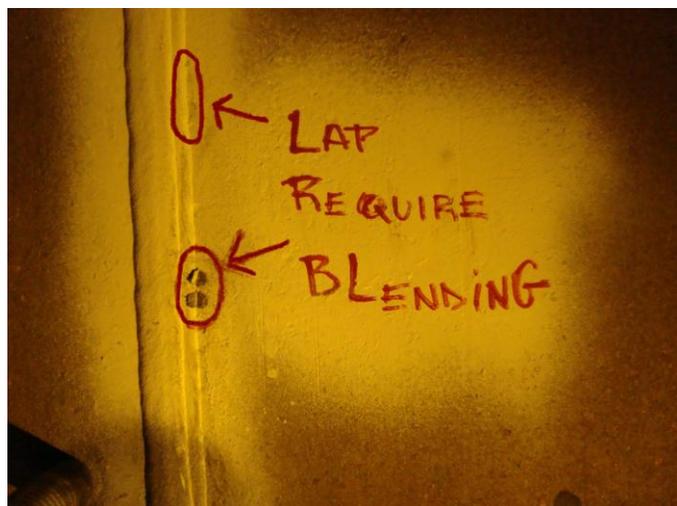


Photo 11 – Circumferential weld seam exhibiting discontinuity.



Photo 12 – Grinding was used to remove discontinuity. MPI subsequently verified soundness of weld seam.

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings



Photo 13 – Nozzle N6 – Thermowell south end.

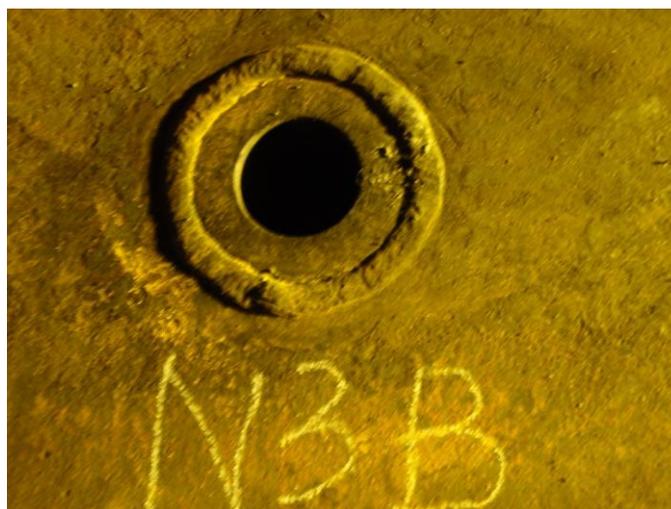


Photo 14 – Nozzle N3B (3" Level control).



Photo 15 – Nozzle N4B (2" Level Indication).



Photo 16 – Nozzle N11 (3" Purge C/W Blind).

List of Attachments

Attachment 1: PT-D2006-090503-DL-MPI

Attachment 2: PT-D2006-090512-NK-MPI

Attachment 3: 98-CA-399735-1D-5

End of Report.

INSPECTION REPORT



MPI Survey

Location:	Point Tupper	EM&I J Report No.:	PT-D2006-090503-DL-MPI
Client Name:	Exxon Mobil Sable	Client Ref No.:	PT-11564905-001-D2006
Client Rep.:	Dale Groves	Inspector Name:	Daniel Lewis
WO No.:	11564905	Inspection Date:	May 03, 2009
SPO No.:	4501905471	Inspection Time:	Various
Workscope No.:	PT-2009-D2006-INT-01	System:	Propane + Liquids
Previous Report No.	NA	EM&I J Job No:	EMJ0132.43
Ref. Drawing No.:	LA-B22-F-22-8006-01-Z4, 98-CA-399735-1D-5, 98-CA-399735-4B		
Technician Certifications:	PCN MPI LVL 2	Certification Expiry Date:	May 05, 2012
Inspection Code:	ASME VIII	Inspection Procedure:	MT401ASME
Material:	C/S	Surface Condition:	Needle gun
Consumables:	Contrast: White	Type: WCP-2	Manufacturer: Magnaflux
Equipment:	Type: Y5	S/N: 1450	Batch: 07H14K/2755
		Calibration Due: 40 Lb Cal lift	Current Type: N/A

Inspection Summary

Comments:

MPI was conducted on the man-way hinges of vessel D-2006.

Restricted access to hinge welds. 50% of weld not able to be inspected due to geometry of hinge.

Foil strip Type 1 indicator (Brass finish) used to test sensitivity. Sensitivity achieved on areas of inspection.

No abnormalities were found in area of inspection.

Daniel Lewis
PCN #302198

Ink

Manufacturer: Magnaflux
Type: 7HF
Solution: Prepared bath
Batch: 07G07K/3679

End of Report

INSPECTION REPORT



Magnetic Particle Inspection

Location:	Point Tupper	EM&I Report No.:	PT-D2006-090512-NK-MPI	
Client Name:	Exxon Mobil Sable	Client Ref No.:	PT-11564905-002-D2006	
Client Rep.:	Dale Groves	Inspector Name:	Neil Keeping	
WO No.:	11564905	Inspection Date:	May 12, 2009	
SPO No.:	4501905471	Inspection Time:	Various	
Workscope No.:	PT-2009-D2006-INT-01	System:	Propane + Liquids	
Previous Report No.	NA	EM&I Job No:	EMJ0132.43	
Ref. Drawing No.:	98-CA-399735-1D	Item Inspected:	Cir Seams/ Nozzle Welds	
Technician Certifications:	CGSB Leve II	Certification Expiry Date:	December 31, 2009	
Inspection Code:	NA	Inspection Procedure:	As per EM&I	
Material:	Carbon Steel	Surface Condition:	Bare Metal	
Consumables:	Contrast: WCP-2	Type: 7HF	Manufacturer: Magnaflux	Expires: N/A
Equipment:	Type: Permanet Magnet	S/N: N/A	Calibration Due: N/A	Current Type: Direct Induction

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings

Inspection Summary:

Black on White Contrast MPI was completd on Pressure Vessel D-2006.

Circular Seams: A total of 7 circular seams were inspected (every second seam). Due to the large diameter of the vessel only the 3 o'clock to 9 o'clock sections of each seam could be accessed for inspection. (See Drawing for locations)

Nozzles: A total of 5 nozzles and 1 manway was inspected. Limited access prevented inspection of the nozzle located on the top vessel.

Details of Findings:

Two 1" indications were located on the 3rd seam from the south header of the vessel in about the 4 o'clock position when facing north. The two indications were located at the edge of the weld head. They appeared to be a "surface non-fusion" discontinuity related to either a cold lap or a bit of weld metal spatter. These indications were repaired by blending with a grinder as an inspection of these areas post grinding revealed no such indications. This repaired did not exceed the corrosion allowance. A measurement of this area confirmed a wall loss of 1mm.

INSPECTION REPORT

Detail of Findings

Instructions: With the aid of Drawing(s), Sketch(es) and Photo(s) describe findings



Photo 1 – Two indications circled in red (pre-repair).

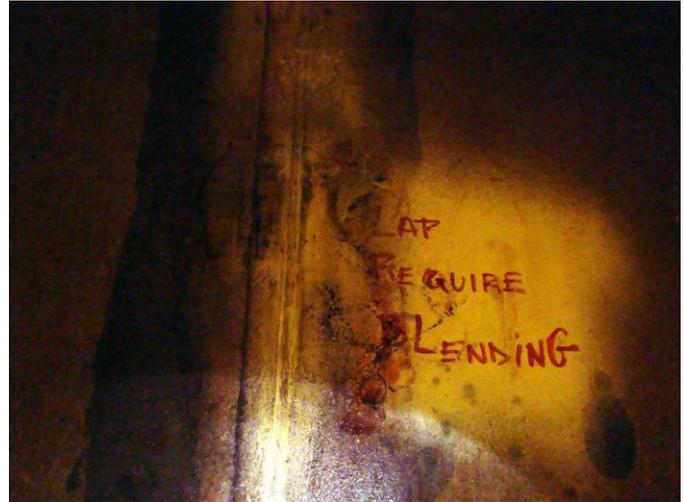
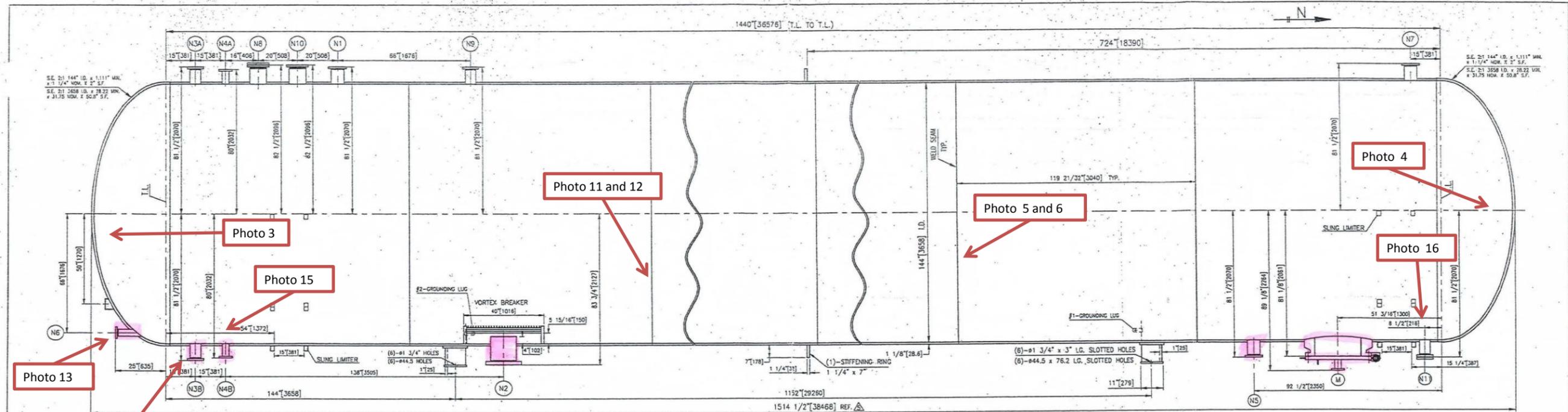


Photo 2 – No indications post-repair.

End of Report



NOZZLE SCHEDULE

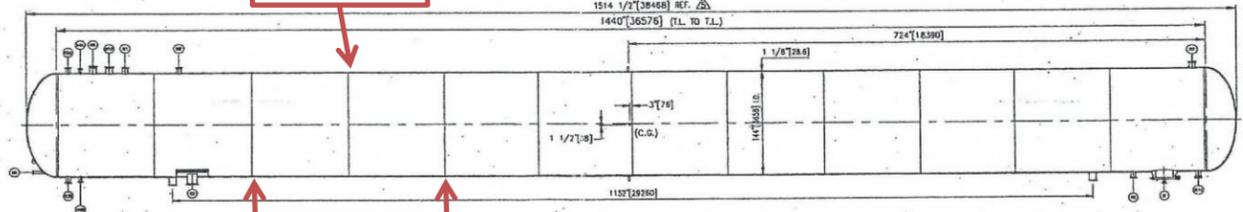
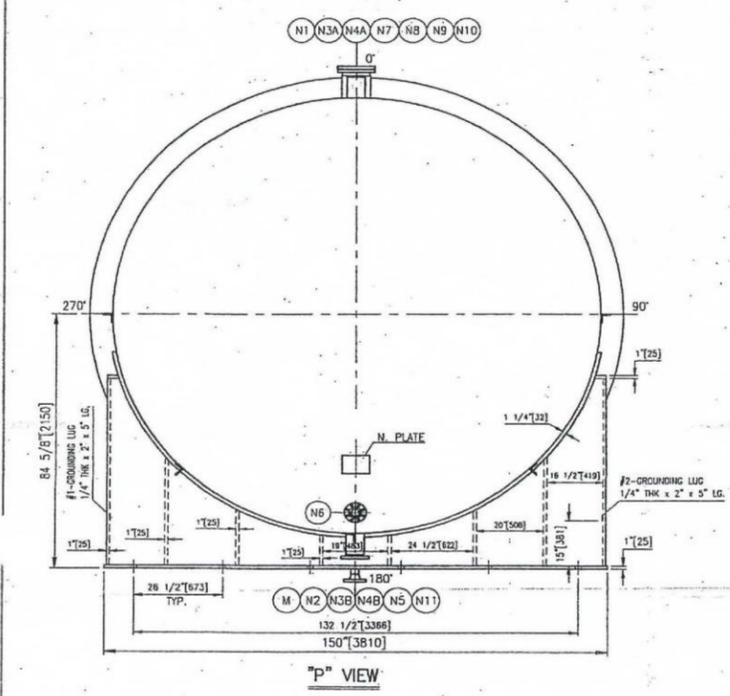
MARK	QUN	SIZE	RATING	TYPE	LA	SDV/THK	STRENGTH VAL. PELLETS	MIN. DIST. BETWEEN	REMARKS
N1	1	4"	150#	INTEGRAL	3.828	1.305	6.945	1.117	OFF-SPEC. PRODUCT INLET
N2	1	10"	300#	INTEGRAL	9.562	1.625	8.258	1.436	LIQUID OUTLET
N3A, N3B	2	3"	300#	INTEGRAL	2.90	1.2375	6.758	1.05	LEVEL CONTROL
N4A, N4B	2	2"	300#	RFLWNF	2	0.6563	6.00	0.6563	LEVEL INDICATION/TRIP
N5	1	4"	150#	INTEGRAL	3.828	1.305	6.945	1.117	TRANSFER
N6	1	2"	300#	INTEGRAL	1.938	1.00	5.477	0.812	THERMOWELL
N7	1	4"	150#	INTEGRAL	3.828	1.305	6.945	1.117	RELIEF
N8	1	6"	150#	INTEGRAL	5.761	1.3695	7.303	1.057	VENT C/W FLUID WITH 2" NPT
N9	1	3"	300#	INTEGRAL	2.90	1.2375	6.758	1.05	PRESSURE VENT TO FLARE
N10	1	6"	150#	INTEGRAL	5.761	1.3695	7.303	1.057	PURGE C/W BLIND
N11	1	3"	300#	INTEGRAL	2.90	1.2375	6.758	1.05	MANWAY C/W BLIND & HINGE
M	1	24"	150#	INTEGRAL	23	3	3.037	1.937	& 2"-300# RFLWNF

CODE: ASME SECT VIII DIV I 1995 & A96
 PARA: UW12(a)
 DESIGN PRESSURE: 250 & -9 PSIG/1724 & -62 kPag
 DESIGN TEMPERATURE: 149° F/65° C
 MIN DESIGN METAL TEMP: -16.6° F/-27° C
 AT PRESSURE: 250 & -9 PSIG/1724 & -62 kPag
 HYDRO TEST PRESSURE: 375 PSIG/2586 kPag
 CORROSION ALLOWANCE: 0.063/1.6 MM
 RADIOGRAPHY: FULL

MATERIAL:
 SHELL: SA516-70N
 HEADS: SA516-70N
 FLANGES: SA105N, SA350-LF2, SA516-70N
 NOZZLES: SA105N, SA350-LF2
 SADDLE: SA516-70
 GASKET: 316 S.S. SPIRAL WOUND GRAFOIL FILLED
 STUDS & NUTS: SA193-B7, TEFLON COATED, SA194-2H TEFLON COATED
 INTERNALS: SA516-70N

WEIGHT EMPTY: 240000 LB WEIGHT FULL OF WATER: 1114000 LB
 SERIAL NO.: 98CA9735D OPERATING WEIGHT: 822000 LB
 REGISTRATION BY: PROVINCE OF NOVA SCOTIA
 INSPECTION BY: TSSA ONTARIO, PATTERSON INDUSTRIES

FINISH:
 INTERNAL--PLATES WITH MILL FINISH,
 WELDS WITH FLUX AND SPATTER REMOVED.
 EXTERNAL--PLATES WITH MILL FINISH,
 WELDS WITH FLUX AND SPATTER REMOVED.



D2006 OFF-SPEC STORAGE VESSEL

CERTIFIED BY PATTERSON INDUSTRIES (CANADA) LIMITED.

SHELL TUBE/SACKET

MAX ALLOWABLE W.P. 250 & -9 PSIG

AT TEMP. 149° F

MIN DESIGN METAL TEMP -16.6° F

AT PRESSURE 250 & -9 PSIG

SERIAL NO. 98CA9735D YEAR BUILT 1998

C.R.N. 9096.8 O.I.N. -

PATTERSON INDUSTRIES (CANADA) LIMITED
 SCARBOROUGH (TORONTO) ONTARIO, CANADA
 MADE IN CANADA

D2006 OFF-SPEC STORAGE VESSEL

CERTIFIED BY PATTERSON INDUSTRIES (CANADA) LIMITED.

SHELL TUBE/SACKET

MAX ALLOWABLE W.P. 1724 & -62 kPag

AT TEMP. 65° C

MIN DESIGN METAL TEMP -27° C

AT PRESSURE 1724 & -62 kPag

SERIAL NO. 98CA9735D YEAR BUILT 1998

C.R.N. 9096.8 O.I.N. -

PATTERSON INDUSTRIES (CANADA) LIMITED
 SCARBOROUGH (TORONTO) ONTARIO, CANADA
 MADE IN CANADA

SCALE: 1"=100"

SURF. PREP. & PAINTING:
 PER SPEC. XA-ADD-Y-15-0005 TABLE 1

- DESIGN LIQUID LEVEL: FULL
- LIQUID S.G. (DESIGN): 0.666
- PWHT: NO
- IMPACT TESTING: NOT REQUIRED PER UCS-66
- INSULATION: NO

NOTE: 1) HYDROSTATIC TEST PRESSURE TO BE HELD FOR ONE HOUR.
 2) ALL WELDS TO BE FULL PENETRATION.

REV. CUSTOMER'S CHANGES
 REV. 2: C.C. 02/00 M.L. JUN 27/98
 REV. 3: CUSTOMER'S CHANGES
 REV. 4: CUSTOMER'S CHANGES
 REV. 5: AS MARKED NOV 13/98

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PATTERSON INDUSTRIES (CANADA) LIMITED
 SCARBOROUGH (TORONTO) ONTARIO, CANADA

OFF-SPEC STORAGE VESSEL

GENERAL ARRANGEMENT

ITEM NO.: D2006

DRAWN M.L. MAR 27/98
 CHECKED S.L. NOV 13/98
 APPROVED S.L. NOV 13/98
 SCALE 1"=24"

REV. 5 98-CA-399735-10 5