Pressure Vessel Survey			
Location:	Point Tupper	**EM&I Report No.:**	PT-D2105A-090429-JW-R0
Client Name:		**Client Ref No.:**	PT-11564910-002-D2105A
Client Rep.:		**Inspector Name:**	Jeremy Wolfe
WO No.:		**Inspection Date:**	April 29, 2009
SPO No.:		**System:**	Butane
Workscope No.:	PT-2009-D-2105A-INT-01	**EMI&J Job No:**	EMJ0132.43
Tag No.:	D-2105A	**Equipment Description:**	Butane Storage Vessel D-2105A
Date of Last Inspection:	NA	**Previous Records Seen:**	NA
Drawing No.:	LA-B23-F-22-8060-01-Z4, 98-CA-399735-1C-5		

Inspection Summary

Item	Condition	Comments
External Ladders, Access and Support Structure		
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.	**Fair**	See Note #1
2. If applicable, check vessel supports for signs of deterioration, settlement, deflection, and/or corrosion.	**Good**	Minor cracking in the concrete supports
3. If applicable, check coatings for signs of deterioration, rusts spots, cracks, blistering, and/or coating disbondment.	**Good**	
4. a) For horizontally mounted vessels, check for signs of trapped moisture, resulting in corrosion between cradle support and vessel shell.	**NA**	Mounts seal welded to vessel
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.	**NA**	
5. Check the grounding connection is correctly installed, with cable connections tight and ground wires in good condition.	**Good**	
6. Check all bolted connections for any signs of corrosion or mechanical damage.	**Good**	
7. If applicable, check the vessel sliding foot free to move and hold-down bolts are free.	**NA**	Vessel fixed
Vessel External Surfaces		
1. Check permanent identifying tags on vessel are legible and present the required information.	**Good**	
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.	**Good**	
3. If applicable, check bolted connections are in full contact with connected elements and connections for any signs of rust, corrosion or mechanical damage.	**Good**	
4. If applicable, check insulation support bands and clips for signs of corrosion or breakage.	**NA**	
5. Check all welded seams and connections for any signs of deterioration, corrosion, cracking, pitting or other sign of failure. Specify.	**Good**	
6) If applicable, check insulation type, condition for any insulation damage and ingress of water. Record insulation type.	**NA**	
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.	**Good**	Paint failure at ladder supports and isolated scattered locatations
8. If applicable, check weep holes in reinforcement plates are not plugged.	**NA**	No re-inforcement pads
External Piping / Instrument Attachments		
1. If applicable, check vessel trim, such as gauges, sight glasses, valves and other appurtenances, show signs of deterioration, or missing components, etc.	**Good**	
2. If applicable, check if the PSV on the vessel is in calibration. Record tag number of PSV and calibration date.	**Good**	Tags in good condition (see Photo #22)
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.	**Good**	Minor coating breakdown, ASTM D610 grade 9-S
Vessel Internal Surfaces		
1. Check for signs of corrosion, erosion, cracks, blisters, pitting, distortion, or other	**Good**	See Note #2

Inspection Summary

Item	Condition	Comments
forms of deterioration on the internal vessel surfaces. If any, specify type, location and extent.		
2. Check all welded joints for any signs of deterioration, corrosion, cracking, pitting or other sign of failure. Specify.	**Fair**	See Note #3
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.	**Fair**	See Note #3
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.	**NA**	
5. Where applicable, check vessel internal cladding for signs of bulging, buckling, cracks, holes, etc. If any, specify type, location and extent.	**NA**	
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.	**NA**	None required
7. If possible, check gasket seals on all flanges for signs of corrosion and/or mechanical damage.	**NA**	
Internal Equipment/Piping /Supports		
1. Where applicable, check supports for vessel's internal equipment and components for signs of corrosion, distortion and deterioration.	**Good**	Vortex breaker
2. If applicable, check vessel's internals for signs of corrosion, distortion and deterioration, missing components etc.	**Good**	
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.	**NA**	

Detail of Findings

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

Note #1: Ladder/platform support viberates with supstainial lateral movement when loaded (wind or climbing ladder). Paint cracking noted at the shell to re-inforcement pad weld and re-inforcement pad to pad-eye weld.

Note #2: Minor pitting noted in shell course. Pitting is situated at the centre line elevation of the shell, shallow depth and small diameter. Numerous grind marks noted throughout the shell at various locations. Generally the diameter and depth is minimal, less than 3cm and 0.5mm respectiviely.

Note #3: Linear defect noted in Nozzle N6 East side of nozzle neck. Defect is approxiately 15cm long, does not appear as a service related defect, but a manufacturing defect. Nozzles N3B, N4B, N5, M and N10 were inspected by MT (DC wet colour contrasting method) and VT all found acceptable. Shell circumferential welds C2 and C6 were inspected by MT (DC wet colour contrasting method) for a length of one meter from the shell centre line down, West side of vessel - found acceptable. Shell circumferential welds C4 and C10 were inspected by MT (DC wet colour contrasting method) for a length of one meter from the shell centre line down East side of vessel - found acceptable. Shell circumferential welds C0, C8 and C12 were inspected by MT at the bottom for a length of 3 feet centered on the bottom centerline of the vessel - found acceptable. No access to the Tee shell welds or nozzles located at the 12 O'Clock position, additionally nozzle N2 was covered by the vortex breaker and not accessible for close visual inspection.

Note #4: Numerous shallow grind marks are scattered over the shell, minimal depth noted and average diameter of each individual grind mark is 25mm.

Detail of Findings

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

Photo 1 – Grind marks on shell, max 0.5mm deep

Photo 2 – Grind marks on shell, max 0.5mm deep

Photo 3 – Material identification stamp on shell. (Low stress dye stamped)

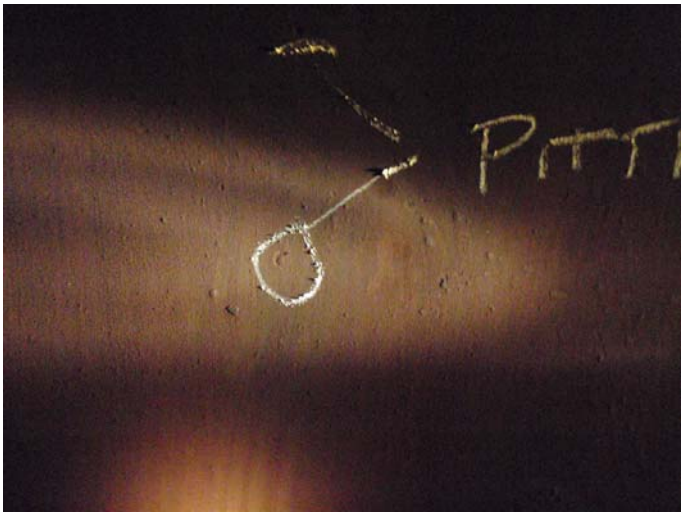

Photo 4 – Pit noted on shell at 4 O'clock position, 0.5mm deep

Detail of Findings

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

Photo 5 – Man-way

Photo 6 – Vortex breaker, good condition

Photo 7 – Nozzles at 12 O'clock position, South end

Photo 8 – Thermo well, South end

Detail of Findings

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

Photo 9 – Magnetic Particle Inspection of girth weld and nozzle N3B, North end

Photo 10 – Grind marks on shell

Photo 11 – Indication found in nozzle neck face (N6)

Photo 12 – Indication highlight by Magnetic Particle (MT)

Detail of Findings

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

Photo 13 – Pick inserted into indication. 5/16 inches deep

Photo 14 – External view of thermo well. Paint removed and inspected by UT and MT

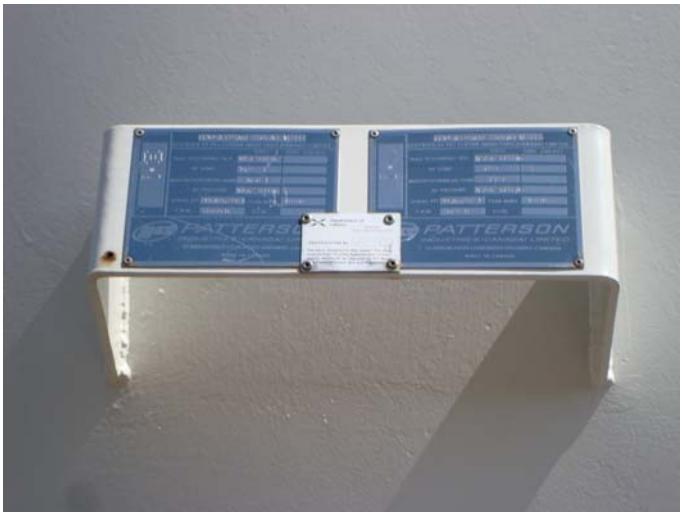

Photo 15 – Nameplate and Cal. Cert. No close visual, access platform deck 3.0m below plate.

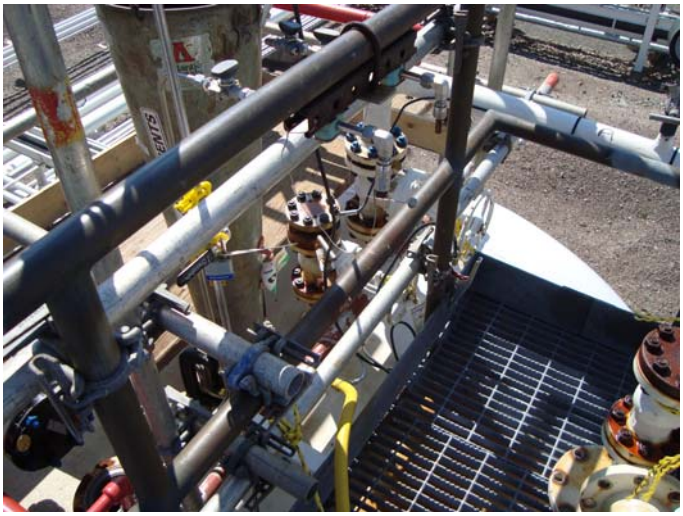

Photo 16 – Piping/Nozzle at top of tank

Detail of Findings

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

Photo 17 – N3B and N4B

Photo 18 – N2 and Pipe work, good condition

Photo 19 – Grounding cable

Photo 20 – Man-way and N5

Detail of Findings

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

Photo 21 – View looking South, down vessel

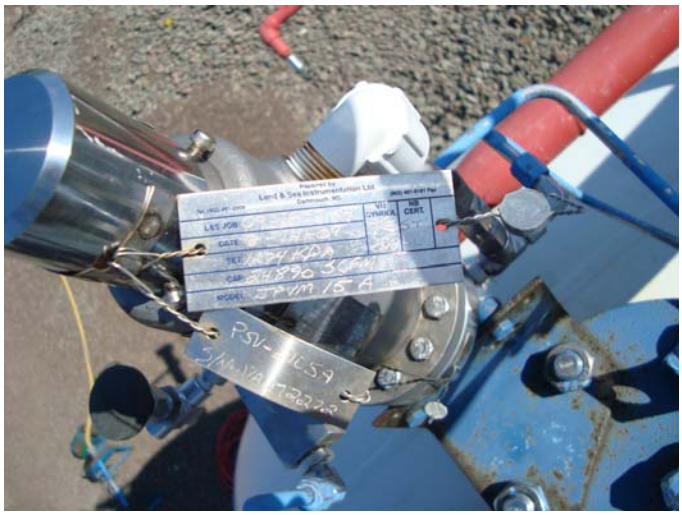

Photo 22 – PSV Tags

Photo 23 – Indication remove from Nozzle N6

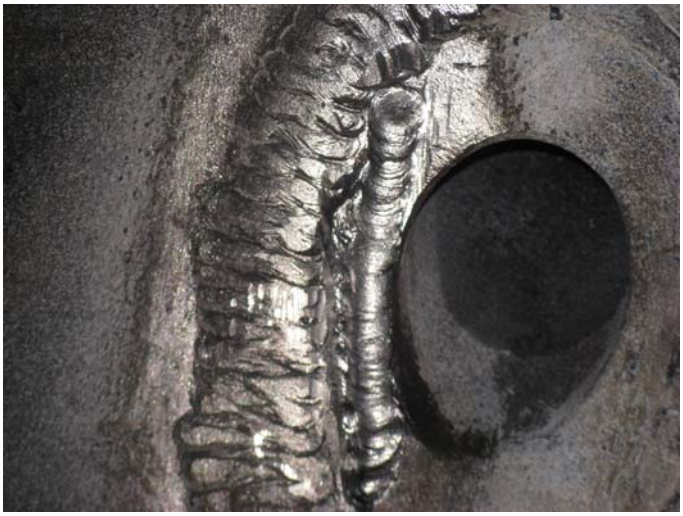

Photo 24 – Finished weld of repair completed to N6

List of Attachments

Attachment 1: Weld Repair Procedure Number AB 09-01 Rev 1

Attachment 2: PT-11564910-001-D2105A (MPI on hinges)

Attachment 3: PT-11564910-002-D2105A (MPI on shell head)

Attachment 4: PT-11564910-002-D2105A (MPI on shell head - 48 hours after)

Attachment 5: 98-CA-399735-1C-5

End of Report

AB MECHANICAL LIMITED		JOB NO.	9-108
		DATE	30-Apr-09
PROJECT	Point Tupper Frac. Plant Vessel Repair	PROJECT SPEC NO.	CSA B-51
CLIENT	AMEC Black and McDonald	APPLICABLE CODE	CSA B-51 ASME VIII-1 ASME IX
ADDRESS	Point Tupper Frac. Plant	CANADIAN REG. NO.	
PO NO.	9-108	SERIAL NO.	Tag -D-2105A
CLIENT DWG	Vendor Dwg	DWG.NO.	

Repair Procedure Number AB 09-01 - Rev 1

1.0] Scope

1.1 To determine the procedure and process to initiate repair of discontinuities as discovered.

2.0] Inspection

2.1 Discovery of any discontinuity shall be verified by the juridictional authorities.
2.2 NDT companies and their appropriate procedures/personnel shall be approved by the same Jurisdictional authorities.

3.0] Records

3.1 Before a repair is made to a discontinuity in a weld or base metal, care shall be taken to investigate its cause and determine its extent and likelihood of recurrence. A report of inspection shall be prepared by the inspection agency.

3.2 Upon concensus an NCR shall be written to identify the item(s) requiring repair and the discontinuity extent. The disposition shall be verified by the repair company and juridictional authorities prior to any remedial action taking place. The NDT and any pertinent report of inspection shall be referenced on the NCR.
3.3 All NDT and repair activities shall be recorded on report formats appropriate to the activity.(IE NDT Report, Weld record)

4.0] Repairs

4.1 Inspections shall be performed using an acceptable method of NDT for the material properties and configuration of discontinuities.
4.2 Excavation can be performed by mechanical means(IE grinding, machining, etc.) or by carbon arc air method. If carbon arc air method is used the variables in the applicable WPS shall be adhered to. (IE preheat, interpass temperature, etc). Method of preheating shall be determined at the site considering all aspects of the work. Temperature of excavation shall be monitored by non-contact thermometers.
Note: Carbon arc air shall only be used for bulk removal.
4.3 NDT shall be performed progressively on the excavated area(s) to determine the complete removal of discontinuity.
4.4 Weld repair shall be performed per the WPS and the code of construction rules pertaining to the item for repair. Verification of the qualifications of the welder shall be recorded/copied to the report dossier.
4.5 If the weld repair will be a multi layered application the finished weld surfaces at each layer shall be given an NDT inspection of the acceptable method for the materials.
4.6 Final weldments shall also be inspected using the NDT method employed previous.

5.0] Final Records

5.1 Final reports should be incorporated into the dossier for the appropriate code item and noted for inspection at the next inspection interval. All appropriate documentation per AB Mechanical Limited QA Manual Issue1 Rev 0 shall be included

6.0 References]

NDT Inspection Company		
NDT Procedure and Method		
NDT Report Number		
Jurisdictional Authority		
Repair Company/QA Manual	AB Mechanical Limited	CSA B-51 QA Manual - Issue1 - Rev 0
Repair Procedures	Written procedure	AB 09-01
	Weld Procedure	WPS GTA 1.1 LT
	Weld Record	9-108 D2105A
	NCR Form	9-108 D2105A
Other References	Welder Qualifications- Traveller- Bill of Materials- Certificates of compliance	
	Calibration Records	

04/30/09

INSPECTION REPORT

EM&I Jacques Ltd.

MPI Survey					
Location:	Point Tupper		**EM&I J Report No.:**	PT-D2105A-090426-DL-R0	
Client Name:	Exxon Mobil Sable		**Client Ref No.:**	PT-11564910-001-D2105A	
Client Rep.:	Dale Groves		**Inspector Name:**	Daniel Lewis	
WO No.:	11564910		**Inspection Date:**	April 26, 2009	
SPO No.:	4501905471		**Inspection Time:**	Various	
Workscope No.:	PT-2009-D2105A-INT-01		**System:**	Butane	
Previous Report No.	NA		**EM&I J Job No:**	EMJ0132.43	
Ref. Drawing No.:	98-CA-399735B				
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	**Batch:** 07H14K/2755	
Equipment:	**Type:** Y5	**S/N:** 1450	**Calibration Due:** 40 Lb Cal lift	**Current Type:** NA	

Inspection Summary

MPI was conducted on the man-way hinges of vessel D-2105A.

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 achieve 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

EM&I Jacques Ltd.

MPI Survey				
Location:	Point Tupper		**EM&I J Report No.:**	PT-D2105A-090501-NE-R0
Client Name:	Exxon Mobil Sable		**Client Ref No.:**	PT-11564910-002-D2105A
Client Rep.:	Dale Groves		**Inspector Name:**	Neil English
WO No.:	11564910		**Inspection Date:**	May 01, 2009
SPO No.:	4501905471		**Inspection Time:**	Various
Workscope No.:	PT-2009-D2105A-INT-01		**System:**	Butane
Previous Report No.	NA		**EM&I J Job No:**	EMJ0132.43
Ref. Drawing No.:	LA-B23-F-22-8060-01-Z4, 98-CA-399735-1C-5			
Technician Certifications:	CGSB MPI LVL 2		**Certification Expiry Date:**	December 31, 2011
Inspection Code:	ASME VIII		**Inspection Procedure:**	MT401ASME
Material:	C/S		**Surface Condition:**	Ground
Consumables:	**Contrast: White**	**Type:** WCP-2	**Manufacturer:** Magnaflux	**Batch:** 07H14K/2755
Equipment:	**Type:** Y6	**S/N:** 12764	**Calibration Due:** 10 Lb Cal lift	**Current Type:** AC

Inspection Summary

Comments:

MPI was conducted on a repair of the shell head in the vicinity of N6. It was an internal repair of the butane storage vessel D-2105A.

MPI was conducted at the completion of each pass after the weld had been cooled to ambient temperature.

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.

Neil English
CGSB: #11752

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

End of Report

INSPECTION REPORT

EM&I Jacques Ltd.

MPI Survey					
Location:	Point Tupper		**EM&I J Report No.:**	PT-D2105A-090504-NE-R0	
Client Name:	Exxon Mobil Sable		**Client Ref No.:**	PT-11564910-002-D2105A	
Client Rep.:	Dale Groves		**Inspector Name:**	Neil English	
WO No.:	11564910		**Inspection Date:**	May 04, 2009	
SPO No.:	4501905471		**Inspection Time:**	Various	
Workscope No.:	PT-2009-D2105A-INT-01		**System:**	Butane	
Previous Report No.	NA		**EM&I J Job No:**	EMJ0132.43	
Ref. Drawing No.:	LA-B23-F-22-8060-01-Z4, 98-CA-399735-1C-5				
Technician Certifications:	CGSB MPI LVL 2		**Certification Expiry Date:**	December 31, 2011	
Inspection Code:	ASME VIII		**Inspection Procedure:**	MT401ASME	
Material:	C/S		**Surface Condition:**	Ground	
Consumables:	**Contrast: White**	**Type:** WCP-2	**Manufacturer:** Magnaflux	**Batch:** 07H14K/2755	
Equipment:	**Type:** Y6	**S/N:** 12764	**Calibration Due:** 10 Lb Cal lift	**Current Type:** AC	

Inspection Summary

Comments:

MPI was conducted on a repair of the shell head in the vicinity of N6. It was an internal repair of the butane storage vessel D-2105A. This inspection was conducted 48 hours after the completion of the repair.

MPI was conducted at the completion of each pass after the weld had been cooled to ambient temperature.

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.

Neil English
CGSB: #11752

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

End of Report

Photo 16

Photo 21

Photo 22 - PSV

Photo 15

Photo 23,24

Photo 14

Photo 17

Photo 10 (east side)

Photo 18

Photo 19

Photo 20

MT(west side)

Photo 6

Photo 7

MT(west side)

East side

Photo 3

ALL WEST SIDE

MT

All long seams at 1:30 and 10:30 O'clock positions, No CVI

MT(west side)

Photo 8

MT No Access

MT (east side)

Bottom

MT

Photo 4, Pitting

Photo 2

Photo 1

Photo 5

Photo 9

MT 4 ft

Photo 11,12,13 (N6)

Some internal structures painted

Areas inspected by magnetic particle (3')