

Tank Visual Inspection Report

| | |
|--|---|
| Foreman: J. Grocock | Location: 01-21-038-02W5M |
| Area: Sylvan Lake Plant | Operations Rep: Dustin Conly |
| Inspector: N. Schmidt | Inspect Date: Nov 12, 2015 |
| STATIC DATA | |
| Equipment Inspected: Lean Oil Storage Tank TK-552 WO# 60008106 | |
| Process: Lean Oil | Volume: 750 BBL - 119.2 m3 |
| Manufacturer: Universal Industries Corp. | Mfr. Date: 2005 |
| Construction Code: API 650 | Roof Girder System: Internal <input type="checkbox"/> External <input type="checkbox"/> N/A <input checked="" type="checkbox"/> |
| Serial #: 05-04-06-13848 | SAP# 66096450 INV. #: 213343 |
| Double Wall: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> | Insulated: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> |
| Roof Thick: 3/16" - 4.76 mm | Material: A36 |
| Wall Thick: 1/4" - 6.35 mm | Material: A36 |
| Floor Thick: 1/4" - 6.35 mm | Material: A36 |
| Elevated: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> | Secondary Containment Type: Steel Wall with liner |
| Internal Coating: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> | Type / Brand: N/A |
| Height: 18' | Diameter: 17'3" |
| OVERALL EQUIPMENT CONDITION SUMMARY | |
| Inspect Type : Internal Visual <input checked="" type="checkbox"/> External Visual <input checked="" type="checkbox"/> UT <input checked="" type="checkbox"/> Other <input type="checkbox"/> | |
| Repair Required: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> | Post Repair Inspect Required: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> |
| Re-Inspect: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> | Recommended Inspect Interval: 10 Yr. |
| Suitable For Continued Service: Y <input checked="" type="checkbox"/> N <input type="checkbox"/> | In Accordance With Code: API 650 |
| Report Is: Partial <input type="checkbox"/> | Preliminary <input type="checkbox"/> Final <input checked="" type="checkbox"/> |
| Prepared By: N. Schmidt | Approved By: Dustin Conly |
| Review Date: Nov 18, 2015 | Next Inspection Date: 2025 |
| Comments / Recommendations: This 750 BBL Lean Oil tank is fit for continued service in it's present application. Based on this condition an inspection interval has been set at 10 years for the next thorough inspection unless the tank is moved or the service conditions change at which time an internal may be required. Continue external monthly inspection as required. | |

Norm Schmidt

IPVI #000362 / API #24957

Inspector's Signature

Site Supervisor's Signature

Tank Visual Inspection Report

| INTERNAL | | | | | |
|-----------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--|
| ITEM | SEVERITY | | | | CONDITION / COMMENTS |
| | NA | 1 | 2 | 3 | |
| ANODES | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| BOLTING / PIPING | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clean, Secure & intact |
| COATING | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| DEMISTER | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| DRAINS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| FLOOR | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Good condition |
| GAUGE CABLES | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Tight & secure- Connected to floor eyelets |
| LADDERS | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| LEVEL CONTROLS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Radar & Float plus Hi Level Trip |
| MIXERS | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| NOZZLES | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clean - no corrosion or pitting observed |
| ROOF | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Good condition as viewed from floor |
| ROOF SUPPORTS | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| SCALE / DEPOSITS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Minor overall on shell & floor sections |
| SIPHONS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| SKIMMER | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| SUMP | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| WALLS / SHELL | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clean - no warping or distortion |
| WELDMENTS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Clean smooth profile |
| EXTERNAL | | | | | |
| ANCHOR BOLTS | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Current anchors not used |
| CATHODIC PROTECTION | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| COATING / PAINT | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Good Original Condition |
| DIKES / BERM | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Steel corrugated wall with liner |
| FIREPROOFING | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| FLANGE / GASKET FACES | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| FOUNDATION | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Tank Not elevated - gravel pad |
| GASKETS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| GRATING | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| GROUND CABLE | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Visible & Intact |
| HANDRAILS / LADDERS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Secured and stable |
| INSULATION / CLADDING | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | |
| MANWAYS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 24" x 36" - Two piece |
| NAMEPLATE | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Intact & legible |
| NOZZLES / REPADS | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Good condition - Weepholes free |
| OVERPRESSURE PROT. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Thief Hatch - Gasket good |
| SUPPORTS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Inlet & outlet piping need support |
| WALLS / SHELL | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | No noticeable distortion or warping |

NA: Not Applicable 1: Requires No Attention 2: Requires Monitoring 3: Requires Repair

Consider: Pitting, erosion, corrosion, mechanical damage, distortion, scale, deposits, leaks, blisters, bulges, tight, loose, missing, spalling, plugged, weeping.

Tank Visual Inspection Report

ADDITIONAL INFORMATION:

Vertical 750 BBL tank is single wall, un-insulated & supported on gravel pad in sweet service & currently in operation. Inspection performed under WO# 60008106

External - Tank is not elevated above grade and sits on gravel base within steel wall secondary containment. Internal access is via 24" x 36" side wall 2- piece manway. External shell adequately protected with original yellow paint in good condition with no noticeable areas of damage. Tank chime area partially exposed in areas but others need gravel/soil removed. This work was requested and completed at time of inspection. Shell consists of two courses of which the lower 10' is 1/4" thick & top 8' is 3/16" thickness. Both courses appear in good condition with no significant areas of distortion or deformation. Ladder with safety cage is solid, secure & intact. External nozzle connections/flanges appear secure, however, attached piping is not adequately supported. Inlet & outlet piping supports have settled & no longer provide weight support which is putting undue stress on flex connections. Shims need to be installed on support shoes to fill gap. Underside of floor plate is not accessible, therefore, internal floor scan was performed during inspection. Roof vent intact & unobstructed. Thief hatch operational with gasket seal in place and good condition. Gage board intact, legible & appears operational. Tank has proper labeling to identify contents. Tank is not heated.

Internal - Shell, floor & roof uncoated and sufficiently cleaned for surface inspection. Majority of floor plate in good condition with accumulations of heavy scale around outer circumference. This could easily be scraped off revealing sound metal underneath with no indication of pitting. Floor lap welded seams in good condition exhibiting smooth clean profile. Streamline NDE performed MFL floor scan during inspection and results found no indication of underside corrosion or deterioration. Some areas of slight concern were proved out with UT with no issues or concerns. Composite material gageboard float displacer moves freely within guide cables anchored to floor and appears to function as designed. Shell/walls clean & in good condition. Minor scale deposits adhering in all areas of shell, however, easily scraped off and revealing sound un-corroded material below. Internal roof as viewed from floor appears in satisfactory condition with no obvious issues or structural deformation noted. Original manufacturing markings still visible on shell sections as seen in photos. Level indication provided by radar transmitter as well as local gage board and Hi-Level float trip in upper shell nozzle. Other internal nozzles, flange faces, siphons & standpipe all in good condition with no indications of corrosion or deterioration.

Tank is in overall very good condition with no signs of damage or leakage.



Overview



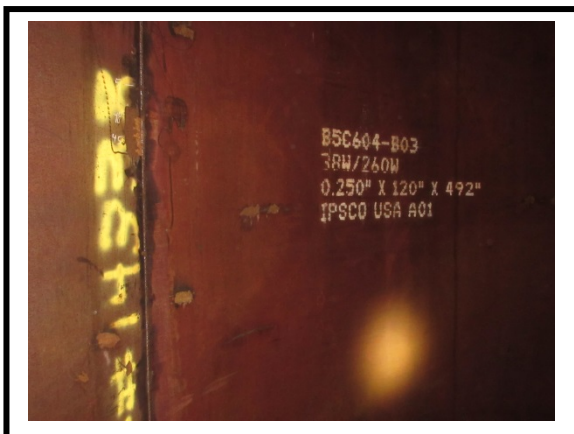
Nameplate.



Surface scale scraped away leaving smooth original plate finish.



Floor lap joint fillet weld.



Original paint & inventory markings still visible on shell.



Overall floor & internal nozzles. No pitting or corrosion found.



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Job #15-549

MFL FLOOR INSPECTION

SAP-66096450

Sylvan Lake Gas Processing Facility
01-21-38-02-W5M

Streamline Inspection Ltd.

11/12/2015

This document contains the API 653 inspection information for tank SAP-66096450, located at Sylvan Lake Gas Processing Facility (01-21-38-02-W5M). Please contact us if there are any questions or comments regarding this report. Thank you for the opportunity to be of service to Husky Energy.

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1. INTRODUCTION

TABLE 1 NAME PLATE DATA

| | | | |
|-------------------|-----------------|------------------|----------------------|
| API Edition: | 650 Mod. App. F | Tank No. | TK-552 |
| Nominal Diameter: | 17' – 3" | SAP No. | 66096450 |
| Nominal Height: | 18' – 0" | STK No. | 213343 |
| Nominal Capacity: | 750 BBL | Serial No. | 05-04-06-13848 |
| Bottom Thickness: | 1/4" | Year Built: | 2005 |
| Shell Thickness: | 1/4" – 3/16" | Design Pressure: | 10 oz. |
| Deck Thickness: | 3/16" | Manufactured By: | Universal Industries |

TABLE 2 TANK DATA

| | | | |
|---------------------------|-----------|--------------------------|-----------|
| Bottom Plate Weld Detail: | Butt Weld | Shell Plate Weld Detail: | Butt Weld |
| Bottom Plate Coating: | None | Roof Type: | Fixed |
| Bottom Plate: | Flat | External Coating: | Paint |

2. INSPECTION SCOPE

Scope of work is to be performed as described in the Husky Energy description of work. For areas of work not covered in the above specified document, the Streamline Inspection Ltd scope of work shall be followed. (Note: In areas of overlap between the Streamline scope of work and the Husky Energy scope of work, the Husky Energy scope of work shall be followed.)

2.1 Bottom Plates

A Magnetic Flux Leakage scan will be performed on the bottom plates in all accessible areas using MFL technology. Areas not accessible for MFL scanning include: areas of rough coating, under piping, floats, skimmers, water/product or surface profile.

Ultrasonic thickness testing is to be performed in areas, which were inaccessible to the MFE scanner. (i.e. Sump, under piping, critical zone, lap welded joints, areas of extensive edge settlement, etc.) In the presence of thick film fibreglass coatings ultrasonic thickness readings are only taken in areas of coating removal.

Ultrasonic / visual prove up of all MFE indications identified in the MFE scan of the bottom / annular ring plates. (Ultrasonic examinations are not able to be performed in areas with a thick film fibreglass coating present, only areas of coating removal can be examined.)

Complete bottom plate layout drawing.

2.2 Miscellaneous

Repair recommendations, remaining life, and inspection interval.

3. REMAINING LIFE ESTIMATION

Years in service: 10

Is tank internally coated? Yes ☐ No ☒

Is lined with: Epoxy ☐ Fiberglass ☐



Is internal lining effective? Yes ☐ No ☐

Is leak detection and containment present in berm? Yes ☒ No ☐

Is a berm liner present: Yes ☒ No ☐

Table 4.4—Bottom Plate Minimum Thickness

| Minimum Bottom Plate Thickness at Next Inspection (in.) | Tank Bottom/ Foundation Design |
|---|---|
| 0.10 | Tank bottom/foundation design with no means for detection and containment of a bottom leak. |
| 0.05 | Tank bottom/foundation design with means to provide detection and containment of a bottom leak. |
| 0.05 | Applied tank bottom reinforced lining, > 0.05 in. thick, in accordance with API 652. |

| | |
|---|------------|
| Nominal Plate thickness: | 0.250 inch |
| Year of tank bottom plate installation: | 2005 |
| Deepest bottom side pit remaining after repairs:  | 0.00 inch |
| Deepest product side pit remaining after repairs:  | 0.000 inch |
| Minimum remaining thickness from bottom side corrosion after repairs (RTbc): | 0.250 inch |
| Minimum remaining thickness from topside corrosion after repairs (Rtip): | 0.250 inch |
| Maximum rate of corrosion not repaired on the bottom side: | 0.000 inch |
| Maximum rate of corrosion not repaired on the topside: | 0.000 inch |
| Duration until the next scheduled out-of-service inspection: | 5 years |
| Minimum remaining thickness at the end of interval: This value must meet the requirements in API Standard 653 Table 4-4. (MRT). | 0.250 inch |
| Estimated time to reach the minimum allowable bottom plate thickness (as stated in API Standard 653 Table 4-4) | 10+ years |
| Next internal inspection: | 2020 |
| Next external inspection: | 2020 |

Note: StPr = 0 in areas with effective coatings, the expected life of the coatings must be greater than or equal to StPr.

4. INSPECTION RESULTS

4.1 Tank Bottom Evaluation

An MFL floor scan was performed on all bottom plates where accessible. As a result of the floor scan, zero (0) underside indications were observed at time of inspection.

Random UT was conducted throughout, no major thickness loss was observed as a result.

A nominal thickness of 0.250 inch was recorded.

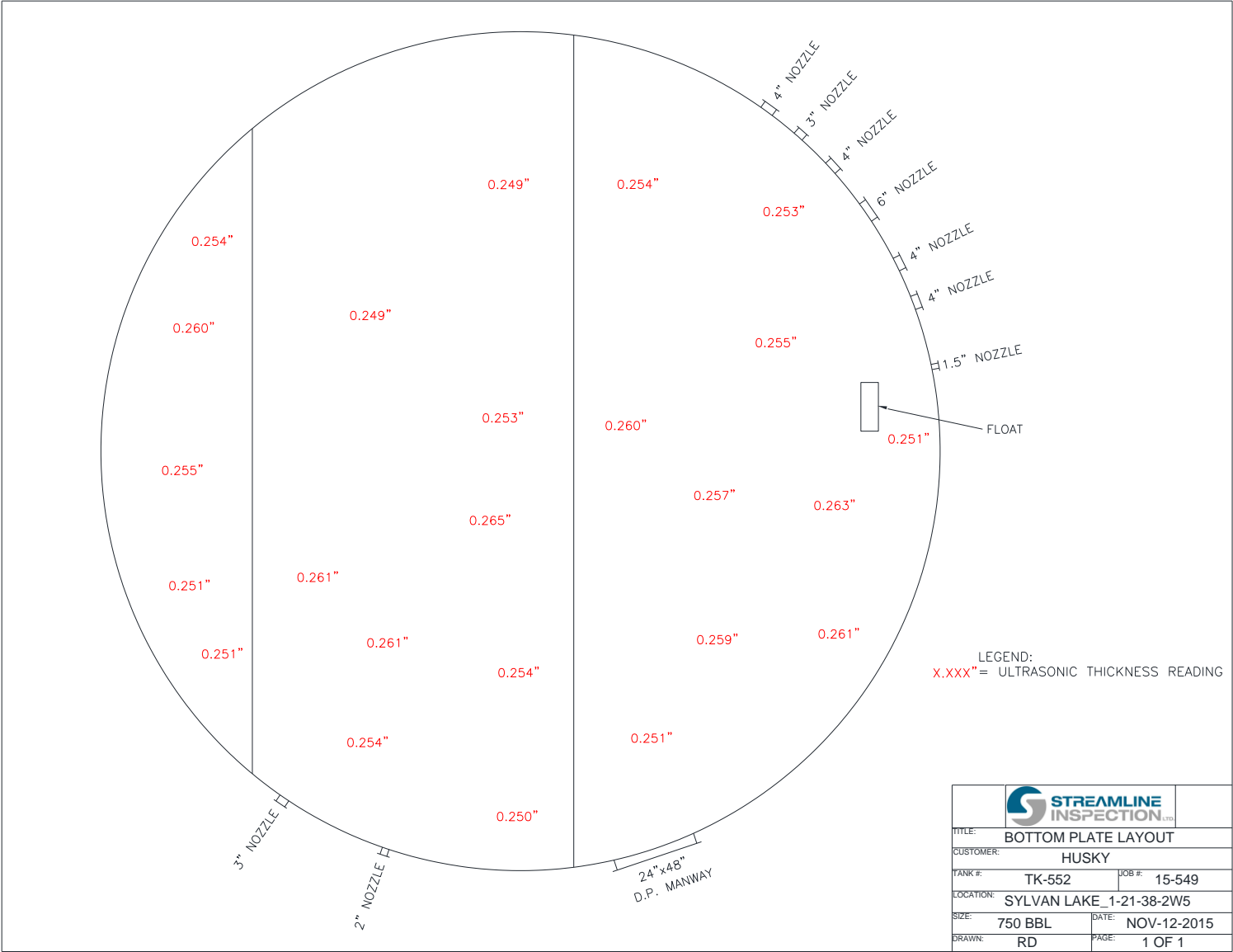


FIGURE 1 BOTTOM PLATE LAYOUT

5. CONCLUSIONS AND RECOMMENDATIONS

There are no recommendations at this time of inspection.

Husky Energy
Sylvan Lake Gas Processing Facility
Tank SAP-66096450
November 12, 2015



Prepared By

A handwritten signature in blue ink, appearing to be 'D. Robak', written over a light blue horizontal line.



Darrin Robak – NDE Technician

Reviewed By

A handwritten signature in blue ink, appearing to be 'B. Boulet', written over a light blue horizontal line.

Brian Boulet - API 653

APPENDIX A – CREW CERTIFICATIONS, PROCEDURES AND EQUIPMENT

| Name | API 653 | API 510 | NDE | UT | PT | MT | RT | CWB | NACE | SNT | MFE/ MFL | Signature |
|--------------|---------|---------|-----|-----------------|----|----|----|-----------------|-------|-----|-------------|---|
| Brian Boulet | 30213 | 28357 | | | | | | Level-2 5209 | 21726 | | 201102 |  |
| Darrin Robak | | | | CGSB-1 19641 | | | | | | | |  |

| Procedure Name | Procedure Number |
|--|----------------------|
| Streamline Visual Inspection Procedure | NDE-002 2010 Edition |
| Streamline Magnetic Flux Exclusion Procedure | NDE-001 2010 Edition |
| Ultrasonic Thickness Procedure | UT-1 |

Unit #7

| Equipment Used | Serial Number | Model Number | Last Calibration Date |
|----------------|---------------|------------------|-------------------------------|
| EPOCH 4 UT Set | 071538005 | | Dec 30, 2014 |
| MFE Mark 2 | MK2-1 | MK2 | Function Test Prior to Use |
| DMS Go | USM6013046069 | | Dec 30, 2014 |
| MT Yoke | | P2 Contour Probe | Dec 30, 2014 |