

A3114502 - LINE HEATER INSPECTION - MAY 2005

1060-04

Canadian Natural Resources Limited
Production - Facilities Engineering
A3114502 Line Heater Inspection Report

Content Date Range: 5/2/2005 to 5/2/2005
Vessel Integrity
Inspection Data

Open: 4/4/2007 Close:

CC+2 0P P

Vital: Yes
Original: Yes
Confidential: No



00782780

**PRESSURE EQUIPMENT INTEGRITY
MANAGEMENT PROGRAM**

**Internal Inspection Checklist
Exhibit #300**

CLK ✓

P.O. Box 2595, Stn. M
425 - 1st St. SW
CALGARY, Alberta
T2P 4V4
Phone: (403) 231-0111 Fax: (403) 231-0526

| | |
|-------------|----------|
| Report No.: | |
| Date: | May 2/03 |
| File No.: | |

| GENERAL PRESSURE VESSEL INFORMATION | |
|---|--|
| Area: <i>Grande Prairie</i> | Location (LSD): <i>Industrial Fabrication Corp.</i> |
| Facility: | Date: <i>May 2/03</i> |
| Vessel Name: <i>Line heater Package</i> | |
| Internally coated: yes <input type="checkbox"/> no <input checked="" type="checkbox"/> | |
| Orientation: horizontal <input checked="" type="checkbox"/> vertical <input type="checkbox"/> | |
| Facility Vessel Identification #: | |
| Separator type (if applicable): 2-phase <input type="checkbox"/> 3-phase <input type="checkbox"/> <i>N/A</i> | |
| Direct fired vessel: yes <input checked="" type="checkbox"/> no <input type="checkbox"/> | Last flame arrestor test date: |
| Status: operating <input type="checkbox"/> shut in <input type="checkbox"/> surplus <input type="checkbox"/> junk <input type="checkbox"/> <i>disassembled for inspection</i> | |
| Thermal insulation: yes <input checked="" type="checkbox"/> no <input type="checkbox"/> | Asbestos: yes <input type="checkbox"/> no <input type="checkbox"/> |

| PRESSURE VESSEL NAMEPLATE DATA | | | |
|--|---|--|-------------|
| "A" number: <i>coil @ 3114502</i> | | CRN number: <i>M5492.2</i> | |
| "S" Number (Sask.): | | B.C. Registration #: | |
| Vessel serial number: <i>1663.H401-3</i> | | Size (i.d. x length): <i>shell 6.4mm x 1312mm x 6198mm</i> | |
| Drawing #: | | Capacity (volume): <i>7.25m³</i> | |
| Shell thickness: | | Shell material: | |
| Head thickness: | | Head material: | |
| Tube wall thickness: <i>Pre 88.9 x 11.09 3</i> | | Tube material: <i>SA106B</i> | |
| Tube size (i.d.): <i>88.9 x 7.62</i> | | RE: <i>SA106B</i> | |
| Channel thickness: | | Channel material: | |
| Design pressure | Shell Side: | Operating pressure | Shell Side: |
| | Tube Side: <i>PRE 21057 kPa RE 9308</i> | | Tube Side: |
| Design temperature | Shell Side: | Operating temperature | Shell Side: |
| | Tube Side: | | Tube Side: |
| X-ray: <i>100%</i> | Heat treatment: <input checked="" type="checkbox"/> <i>yes</i> | | |
| Code parameters: | Joint efficiency (j.e.): | | |
| Manufacturer: <i>Plains Oil</i> | Year built: <i>1995</i> | | |
| Corrosion allowance: | Manway? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | | |

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PSV DATA

LOCATION (Reference Pressure Vessel A# that the valve is attached to or protecting. Where the valve is not protecting a vessel describe the piping system location. i.e. Inlet Header or Compressor Discharge):

| | Set Pressure | CRN # | Manufacturer / Model / Tag # / Serial # | Capacity (Scfm) | Size | Set Date |
|------------|--------------|-------|---|-----------------|------|----------|
| Shell Side | | | | | | |
| Tube Side | | | | | | |

SERVICE CONDITIONS

| | | | |
|--|-----------------------------------|---------------------------------------|--|
| Steam <input type="checkbox"/> | Air <input type="checkbox"/> | Sweet Oil <input type="checkbox"/> | Sour Oil <input checked="" type="checkbox"/> |
| Sour Condensate <input checked="" type="checkbox"/> | LPG <input type="checkbox"/> | Sweet Gas <input type="checkbox"/> | Sour Gas <input type="checkbox"/> |
| Sweet Condensate <input checked="" type="checkbox"/> | Nitrogen <input type="checkbox"/> | Amine <input type="checkbox"/> | Salt Water <input type="checkbox"/> |
| Chlorine <input type="checkbox"/> | Ammonia <input type="checkbox"/> | Sweet Glycol <input type="checkbox"/> | Sour Glycol <input type="checkbox"/> |
| Sulphur <input type="checkbox"/> | Other | | |

GENERAL INSPECTION CHECKLIST

Pressure Gauge Condition: *PI 102 & 103 require calibration*

Foundation Condition:

Shells / Heads / Piping

External Condition:

Internal Condition: (address pitting, general metal loss, hydrogen blistering, scale buildup)

Nozzles / Flange Condition: *so new*

Internal Piping / Bolting / Pipe support Condition: *no corrosion or wear*

Firetube Condition: *acceptable - no blister seen cracks or wall loss*

Demister Pad Condition:

Anode Condition:

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Exchangers

Exchanger Type (Kettle, Shell and Tube):

Channel Head / Bonnet Condition:

Stays and Tube Support Condition:

Tubesheet Condition:

External Tube Bundle Condition:

Internal Tube Bundle Condition:

Shell Side Fouling:

Tube Side Fouling:

Coating Inspection

Type and Manufacturer of Coating:

Location:

Coating Condition:

NDE Inspection

Type of Testing: *UT*

Location of Test: *return bends, fire tube, various bends on pipe*

Contractors Name: *ATEC - G.P.*

Contractors Qualifications:

Test Results: *acceptable*

| Vessel Status | YES | NO |
|------------------------------|-------------------------------------|--------------------------|
| Suitable for Further Service | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Repairs Required | <input type="checkbox"/> | <input type="checkbox"/> |
| Repairs Completed | <input type="checkbox"/> | <input type="checkbox"/> |

Repairs completed by: *[Signature]* Date: _____

Owners Representative: *[Signature]* Date: *May 2/05*

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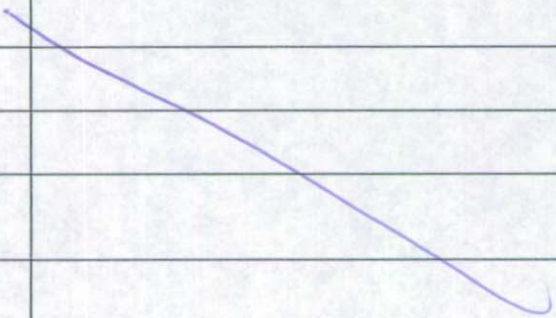
Tower Summary

| Location: | | Vessel Name: | | Vessel A #: | |
|-----------------|----------------|--------------|-----------------|-------------|--|
| Tray Level | Tray Condition | | Shell Condition | | |
| Top Head/ Shell | | | | | |
| Tray 1 | | | | | |
| Tray 2 | | | | | |
| Tray 3 | | | | | |
| Tray 4 | | | | | |
| Tray 5 | | | | | |
| Tray 6 | | | | | |
| Tray 7 | | | | | |
| Tray 8 | | | | | |
| Tray 9 | | | | | |
| Tray 10 | | | | | |
| Tray 11 | | | | | |
| Tray 12 | | | | | |
| Tray 13 | | | | | |
| Tray 14 | | | | | |
| Tray 15 | | | | | |
| Tray 16 | | | | | |
| Tray 17 | | | | | |
| Tray 18 | | | | | |
| Tray 19 | | | | | |

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Tower Summary

| | | | | | |
|-----------------------|---|--------------|-----------------|-------------|--|
| Location: | | Vessel Name: | | Vessel A #: | |
| Tray Level | Tray Condition | | Shell Condition | | |
| Tray 20 |  | | | | |
| Tray 21 | | | | | |
| Tray 22 | | | | | |
| Tray 23 | | | | | |
| Bottom Head and Shell | | | | | |

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Recommendations:

Excellent condition. Suitable for service
Flame arrester test after return to service
Instrumentation checks - low level shutoff

| Name (PRINTED) | Signature | Date |
|---|-------------------------------------|-----------------|
| VISUAL INSERVICE INSPECTOR: | | |
| QA ADMINISTRATOR: | | |
| QA COORDINATOR: Terry McConnell MARK COPITHORNE | <i>Terry McConnell</i> <i>MC</i> | <i>May 2/05</i> |
| ABSA SAFETY CODES OFFICER: | | |



ULTRASONIC EXAMINATION REPORT

UT - 5210

CLIENT: AMADARRO CANADA
 INVOICE ADDRESS: P.O. Box 39, GORDONDALE AB T0H 1V0
 WORK LOCATION: LFL Yard, Industrial Park, Grande Prairie
 STANDARD / AITEC PROCEDURE: ASTM E-797, UT-1
 ACCEPTANCE STANDARD: ASME B 31.3
 EXAMINATION OF: LINE HEATER COIL, FIRE TUBE AND SHELL, A# 3114502
 SURFACE: As Ground Machined Shot Blasted Base Metal Painted As Welded

JOB NO.: 700-01-2195
 DEPT. CODE: 700
 DATE: April 28/05
 P.O. NO.:
 W.O. NO.: Job # 16002-625
 PAGE 1 OF 2

ULTRASONIC EQUIPMENT:

Instrument: PANAMETRICS Model: EPIC III Serial No.: 99219506 Cal. Date: MARCH 31ST, 2005
 Cal. Blks: .100" step #18 Couplant: UT-X Transfer Value: _____ (dB)
 Scanning Limitation: _____

| TRANSDUCER ANGLE | FREQUENCY | CRYSTAL SIZE | PRIMARY REFERENCE RESPONSE (dB) (%) | SCANNING SENSITIVITY (dB) | RANGE CALIBRATION (mm) |
|------------------|---------------|--------------|-------------------------------------|---------------------------|------------------------|
| <u>0°</u> | <u>7.5MHz</u> | <u>.25"</u> | <u>80% FSH</u> | <u>As Req'd</u> | <u>1.00"</u> |
| | | | | | |
| | | | | | |

A ZERO DEGREE ULTRASONIC EXAMINATION WAS CONDUCTED ON LINEHEATER COIL, FIRE TUBE & SHELL, A# 3114502, AS REQUESTED BY CLIENT.
 RESULTS: PLEASE REFER TO PAGE 2 FOR DESCRIPTION OF AREAS EXAMINED AND LOW $\frac{1}{2}$ AVE. THICKNESS MEASUREMENTS.
 VISUAL INSPECTION REVEALED NO CORROSION OR PITTING ON ANY LINEHEATER COMPONENTS. ALL INTERNAL CONNECTIONS AND WELDING IN LIKE-NEW CONDITION. API STD #26089

| A.M. | | P.M. | | TOTAL HOURS | KILOMETERS | SUBSISTENCE | | CONSUMABLES |
|---------|----------|---------|----------|-------------------------------|------------|-----------------------|------------|-------------|
| TIME IN | TIME OUT | TIME IN | TIME OUT | | | MAN DAY | OT / MEALS | |
| | | | | <u>S.T. 3 hrs.</u> | <u>30</u> | <u>1 TIME Summary</u> | | |
| | | | | <u>O.T. hrs.</u> | | | | |

TECHNICIAN(S)
 Interpretation is in accordance with the above mentioned standards, to the best of my professional ability.
 Print: Clean Allan CGSB / ASNT Level: II UT/MT/PT Reg. No.: 9738 Sign: [Signature]
 Ass't: Lance Beelow CGSB / ASNT Level: _____ Reg. No.: _____ Sign: _____
 The above representation is a professional opinion, final interpretation is the responsibility of the client. I have reviewed and am in full agreement with the contents of this report.
 Client Representative: (Print) BRIAN BULLIEN Sign: [Signature] Date: April 28/05

EXAMINATION CONTINUATION REPORT

CLIENT: ANADARCO CANADA CORP.
 WORK LOCATION: IFC YARD, IND. PARK GRANGE PRairie
 EXAMINATION OF: LINE HEATER A# 3114502

REPAIR # UT-5210
 JOB NO.: 700-01-219
 DATE: April 28th 2005
 PAGE: 2 OF 2

A# 3114502 CRN M5492.2 BUT 1995

COIL #1 (PREHEAT)
 3" SCH 160 180° BENDS
 Nom. - .437"
 MAWP - 21057 Kpa

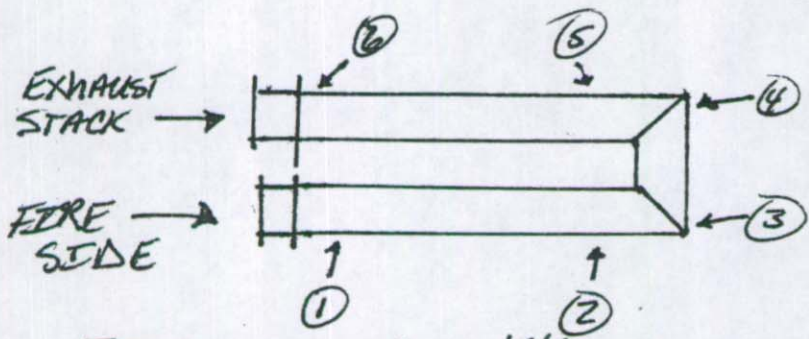
COIL #2 (RE-HEAT)
 3" SCH XS
 Nom - 0.300"
 MAWP - 9308 Kpa

AREA LOW AVE

| | | |
|---|-------|-------|
| 1 | .395" | .405" |
| 2 | .390" | .405" |
| 3 | .380" | .390" |
| 4 | .385" | .400" |
| 5 | .375" | .385" |

AREA LOW AVE

| | | |
|----|-------|-------|
| 6 | .230" | .260" |
| 7 | .240" | .260" |
| 8 | .250" | .270" |
| 9 | .265" | .280" |
| 10 | .235" | .260" |
| 11 | .265" | .280" |
| 12 | .260" | .280" |



FIRETUBE OD - 14"
 NOMINAL - 0.375"

| AREA | Low | Ave |
|------|------|------|
| 1 | .365 | .375 |
| 2 | .350 | .375 |
| 3 | .365 | .375 |
| 4 | .355 | .375 |
| 5 | .360 | .375 |
| 6 | .375 | .375 |

COIL, FIRETUBE AND L/H INTERNAL SHELL
 IN LIKE-NEW CONDITION. NO SCALE, CORROSION
 OR OTHER VISUAL DEFECTS NOTED. INITIAL FABRICATION MARKINGS
 STILL VISIBLE (API STD CERT # 26089)

