A0161747_TREATER REPAIR_MAY 2006

1060-07

Canadian Natural Resources Limited
Production - Facilities Engineering
A0161747 Horizontal Treater Repair

Content Date Range: 5/8/2006 to 5/8/2006

Vessel Integrity

Repair Data

Open: 3/5/2007 Close:

Vital: Yes
Original: Yes
Confidential No

CC+2 0P P

00769080

BOILERS AND PRESSURE VESSELS
REPAIR AND ALTERATION REPORT

(A) #: 161747

OWNER EQUIP NO.: L-8-143

REPAIR ☒ and/or ALTERATION ☐ Partial ☐ Final ☐

1. **Name and Address of Organization** doing Repair/Alteration Eastend Iron Ind. Ltd.

   6215 54 Ave. Taber Alta T1G1X4 AQP No. & Expiry Date 2972 July 27, 2007

   Location of Installation 9-17-11-16w4

2. **Name of Owner** C.N.R.L

   Address

3. **Boiler/Pressure Vessel Description** Horizontal treater CRN B.5946.2

   Manufacturer's Name C.E. Natco Limited Serial No. L-8-143

4. **Design Conditions:**
   a) Vessel/Shellside/Boiler: Max Allowable Working Press. 344.5kpa Min/Max Design Temp 93/c
   b) Jacket/Tubeside: Max Allowable Working Press. Min/Max Design Temp /

5. **Description of defects** (location and types of deterioration that resulted in the repair/alteration).

   Crack were found on the firetube were the gusset had been welded. To many cracks, and pitting were found after the gusset was removed.

6. **ASME Code Edition and Addenda** used for work: ASME Sect. VIII Year 2004 Addenda

7. **Repair/Alter. Description of Work.** Step by step description of repair/alteration method, attach additional sheets as needed.

   Note 1: Repair/Alteration Procedure to be accepted by Alberta Boilers Safety Association SCO prior to start of work.

   Both legs of the firetube will be replaced. the cracks found on the flange will be ground out till sound metal is exposed. The areas will be preheated and weled with E-7018 electrodes. The two legs will have E-6010 electrode roots, and will be filled and capped with E-7018 electrodes.

8. **Material** - List any material used in repair/alteration and any base material welded on:

Item	Mat'l Spec.	Thick/Sch	Diam	Item	Mat'l Spec.	Thick/Sch	Diam
Shell/Drum				Heads/ Ends			
Tubesheet				Tubes	A-106B	.375	18"
Nozzles				Flanges/Fittings		Class	

9. **Welding Procedure** - Alberta Registration Number WP- 2178.2 WPS Numbers used: EII 2

10. **Heat Treatment:** Bake Out (Temp./Time) / hr Preheat Temp 300f Post Weld HT (Temp./Time) / hr

11. **Non Destructive Examination** (Specify type and extent).

A mag partical exam will be preformed on all welds, and repaired cracks. A 100% xray will be preformed on the 4 joints.

(A) #: 161747 **OWNER EQUIP. NO.** L-8-143

Pressure Test	Vessel/Boiler/Shellside	Tubeside/Jacket
a) Hydrostatic	NA	NA
b) Other Test	NA	NA

13. **Welded Replacement Parts:** Attached are Manufacturer's Partial Data Reports or Repair/Alteration Reports properly identified and signed by Authorized Inspectors for the following items of this report: (Welded parts supplied by others).

14. **Responsibility Owner/Client**. Identify below items that the owner/client has assumed responsibility for. **Note (2)**

a) Design Submission O b) Repair/Alteration Procedure: C c) Material Control C

d) Welding Control C e) NDE C f) Heat Treatment C g) Pressure Test C

Note 2: Owner/client must have a valid Alberta Quality Program (AQP), for the scope of work, to assume responsibility for function c, d, e, f, or g.

15. **REMARKS**: The affected areas were mag particaled, and xrayed. No rejectable indictions were noted at the time of the inspection.

16. **CERTIFICATE OF COMPLIANCE**

We certify that the statements made in this Report are correct and that all design, material, construction and workmanship on this repair/alteration conform to the requirements of the Alberta Safety Codes Act and Regulations.

a) For all items except for items identified in 14:

Eastend Iron Ind. Ltd.
(Repair/Alteration Organization Name)

AQP#2972 July 27, 07
(AQP Number & Expiry Date)

(Signature & Date) May 8, 06

W.G. Van Der Meulen
(Print Name)

b) For items identified in 14 only:

(Owner/Client Organization Name)

(AQP Number & Expiry Date)

(Signature & Date)

(Print Name)

17. DATE WORK WAS COMPLETED: May 8, 2006

18. **CERTIFICATE OF INSPECTION**

I have inspected the repairs and/or alterations described in this report. To the best of my knowledge this work has been done in accordance with the Safety Codes Act and Regulations.

a) Owner-User Inspection Certification (Field Only)
(Required when Owner-User Inspects the work under their ABSA Authorized Owner-User Quality Program).

Owner-User AQP# & Expiry Date

Owner User In-Service Inspector Signature & Date

Owner-User In-Service Inspector Name (Please Print)

Owner-User In-Service Inspector Alberta Cert #

b) ABSA Safety Codes Officer Certification
(when work is inspected by ABSA).

ABSA SCO Signature & Date

Print Name

Report Received by ABSA SCO _____ Date

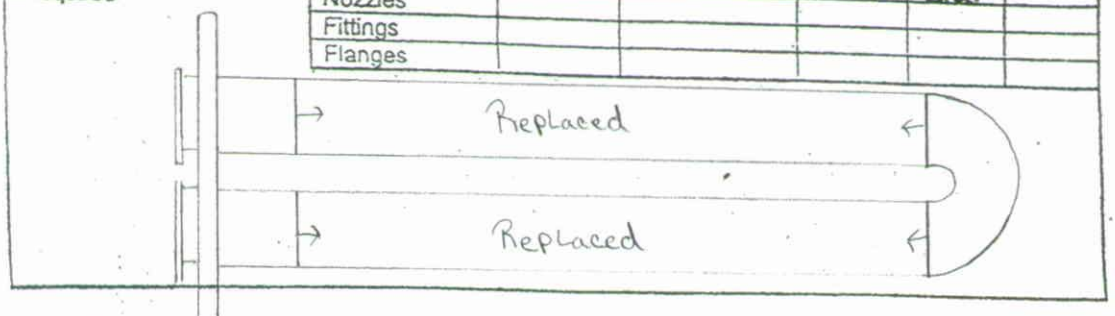
EASTEND IRON INDUSTRIES (1995) LTD.

EXAMINATION & INSPECTION REPORT
Pressure Vessel Repair or Alteration

Pressure Vessel Description	Serial Number	Alberta (A) No.
Horizontal Treater	L-8-143	161747

Delete items which are not applicable	Comments	Initial and Date QCM	ABSA Safety Codes Officer	Owner's Insp.
1) Contract Reviewed		Rw 04/10/06		
2) Repair or Alteration Procedure Accepted by ABSA Safety Codes Officer (and Owner User Program Inspector, when applicable)		Rw 04/10/06		
3) Welding Procedures Registered for Welding to be done		Rw 04/10/06		
4) Welders have valid Alberta PQ card for work to be done		Rw 04/10/06		
5) Drawings Released		Rw 04/10/06		
6) Cracks Mag Particle/Dye check after removal		Rw 04/11/06		
7) Material to be used:				
- checked against PO/Drawing		Rw 05/01/06		
- material identified with correct SA/SB Specifications		Rw 05/01/06		
- material test reports checked against Specification		Rw 05/01/06		
8) Fitup:				
- Shell Courses - Flush Patches - Heads				
- Tubesheet / Shell / Firetube		Rw 05/02/06		
- Nozzles and Fittings				
9) Radiographic Examinations		Rw 05/08/06		
10) Ultrasonic Examination/Magnetic Particle / Dye Penetrant		Rw 05/08/06		
11) Internal Visual after welding		Rw 05/03/06		
12) External Visual after welding		Rw 05/04/06		
13) Heat Treatment		Rw 05/01/06		
14) Hardness Tests				
15) Non Conformances Cleared				
16) Hydrostatic Pressure Test				
17) Alternative Test (Specify)				
18) Alberta Repair or Alteration Form AB-40 completed		Rw 05/02/06		
19) Repair or Alteration name plate attached				

OUTLINE SKETCH	MATERIAL USED IN REPAIR / ALTERATION					
(Record Welder's Symbols and Heat No.'s, Radiograph ID's). Attach separate sketch if required.	Item	Mat'l Spec.	Ht. No.'s Pl. & Heads	Thk.	Sch.	Rating
	Shell/Patches					
	Heads/End					
	Tubesheet					
	Firetube	A-106	826451	.375	Std.	
	Nozzles					
	Fittings					
	Flanges					



Hold Points are indicated by an asterisk - *

LAW INSPECTION SERVICES INC.

P.O. Box 1971 Lethbridge, AB
T1J 4K5 Ph. (403) 380-3555

Date MAY 8/06

Page 2 of 2

Magnetic Particle/Penetrant Inspection

Client CNRL Client #

Location 9-17-11-16 W4 LAW Job # AT-23

MAGNETIC PARTICLE: (Check One) LAW Procedure ☐ MT-1A ☐ MT-2A ☒ MT-3A ☐ Other

EQUIPMENT: • Yoke S/N 740 E • Make WESTERN • Cal date JAN 13/06

BLACKLIGHT: • Serial # • Make • Cal test Date

METHOD: ☐ AC ☒ DC ☐ HWDW ☐ Fluorescent ☒ Visible ☒ Continuous ☒ 12 V
☐ Residual ☒ Wet ☐ Dry

PARTICLE: ☐ Red ☒ Black ☐ Grey ☐ Green

CODE: ☒ ASME VIII DIV I APPENDIX VI ☐ Other

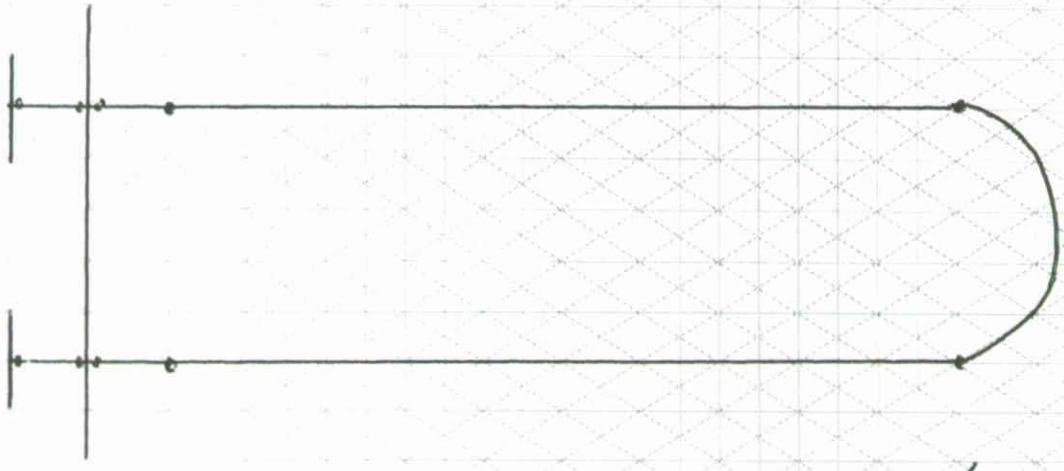
DYE PENETRANT: (Check One) LAW Procedure ☐ PT-1A ☐ PT-2A ☐ PT-3A ☐ PT-B1 ☐ PT-B2 ☐ PT-B3
(SEE REVERSE)

BLACKLIGHT: (Serial#) Make Cal. Test

PRODUCT NAME: Penetrant # Cleaner #

CODE: ☐ ASME VIII DIV I APPENDIX VIII ☐ Other

ITEM INSPECTED: ALL WELDS ON FIRETUBE.



RESULTS: ALL WELDS ARE ACCEPTABLE TO CODE.

REG	OT	KM	SUB	Est. Cost	STAMP	
					LAW INSPECTION Warren Graham CGSB RTIII, MTII, PTII, UTI ASNT RTIII, MTII, PTII, UTI #5841	Client Signature Barry Weinberger
						Client Print
						Tech. Signature

Invoice # M 2687

The WARWICK PRINTING Co. Ltd.

LAW INSPECTION SERVICES INC.

P.O. Box 1971 Lethbridge, AB
T1J - 4K5 Ph. (403) 380-3555
Fax. (403) 394-0498

Date MAY 8/06
Page 1 of 2

R - 21569

Radiographic Inspection Report

Client: CNRL Client #

Location: 9-17-11-16 W4 Code(s) UW-51

Material CARBON STEEL Source 3.5mm / Ir 192 (SIZE / TYPE) Screens 0.010"Pb F+B Film KODAK / T (BRAND / TYPE)

LAW Job # AT-23 SFD DWC. Technique(s) Refer to back

T = Technique
WS = Welder Stamp
IP = Incomplete Penetration
LF = Lack of Fusion
P = Porosity
S = Slag
BT = Burn Through
IC = Internal Concavity
LC = Low Cover
HL = High Low
CK = Crack
IUC = Internal Undercut
EUC = External Undercut
ACC = Accept
Rej = Reject
O = Other
1= Slight
2= Moderate
3= Severe

	Film #	SIZE/THK NPS/SCH	ACC	T	WS	IP	LF	P	S	BT	IC	LC	HL	CK	IUC	EUC	O	Comments	REJ
1	X-1	18"/.375"		1															
2	0-36		✓																
3	36-72		✓							2									
4	72-108		✓																
5	108→0		✓																
6																			
7	X-2	18"/.375"		1															
8	0-36		✓																
9	36-72		✓																
10	72-108		✓																
11	108-0		✓																
12																			
13	X-3	18"/.375"		1															
14	0-36		✓																
15	36-72		✓																
16	72-108		✓																
17	108-0		✓																
18																			
19	X-4	18"/.375"		1															
20	0-36		✓																
21	36-72		✓																
22	72-108		✓																
23	108-0		✓						1										
24																			

Weld or film quantity		Other (specify)
2"		16 - 4½" x 17"
3"		
4"		
6"		

Stamp
Warren Graham
CGSB RTIII, MTII, PTII, UTI
ASNT RTIII, MTII, PTII, UTI
#5841

Reg. hrs.	O.T. Hrs.	kms	Sub-days	Est. cost
3	0	0	0	

Client Signature Kerry Weinberger
Client Print
Technician Signature

White - FILM Green - CLIENT Canary - INVOICE Pink - FILE Golden Rod - OFFICE

Pamela Jones

From: Keith McIntosh

Sent: Tuesday, March 14, 2006 3:32 PM

To: Pamela Jones

Subject: Fire Tube Repair for North Taber

Pam;
The Fire tube repair for the North Taber Oil Battery is in progress. The blasting will be done at Ar-tech tomorrow March 15, with Dave Anderson doing the inspection Cellular: (403) 542-4931.
The repair will be done by EastEnd Iron, George is already aware of it and has the U1A.
Group Treater A#0161747
North Taber Oil Battery
LSD: 9-17-11-16W4
Site Contact: Gord Spears (403) 634-2461
There are two tubes in this treater, this one has been blinded and they are running.

Keith

161747

FORM U-1A MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS (A) 161747
(Alternate Form for Single Chamber, Completely Shop-Fabricated Vessels Only)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

FEB 25 1981

1. Manufactured by C.E. NATCO LIMITED 1100A-58th AVE. S.E., CALGARY, ALBERTA
2. Manufactured for SUNDANCE OIL CANADA LTD., 2400 4th AVE. S.W., CALGARY, ALBERTA
3. Location of Installation TABER, ALBERTA (9-17-11-17-W4M)
4. Type HORIZONTAL (Horiz. or Vert. Tank) L-8-143 (Mfg'r Serial No.) B.5946.2 (CRN) LA-9191 (Drawing No.) (Nat'l Brd No.) (Year Built) 80
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1 77 (Year) and Addenda to WINTER 79 (Date) and Code Case Nos. —
Special Service per UG-120(d) —
Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: —
6. Shell: Matl. SA-516-70 (Spec. No., Grade) Nom. Thk. 7.9 mm Corr. Allow. NIL mm Diam. 2438MM mm Lgth. 9144 mm
7. Seams: Long. SNGL V BUTT (Welded, Dbl, Sngl, Lap, Butt) R.T. SPOT (Spot or Full) Efficiency 85 % H.T. Temp. — Time — hr
Girth SNGL V BUTT (Welded, Dbl, Sngl, Lap, Butt) R.T. PARTIAL (Spot, Partial, or Full) No. of Courses 3
8. Heads: (a) Material SA-285-C (Spec. No., Grade) (b) Material SA-516-70 (Spec. No., Grade)

	Location (Top, Bottom, Ends)	Min. Thk.	Corr. Allow.	Crown Radius	Knuckle Radius	Ellipse Ratio	Conical Apex Angle	Hemisph. Radius	Flat Diam.	Side to Pressure (Convex or Concave)
(a)	LEFT	12.7MM	NIL	24.38MM	149MM	F&D	—	—	—	CONCAVE
(b)	RIGHT	7.9MM	NIL	2433MM	149	F&D	—	—	—	CONCAVE

If removable, bolts used (describe other fastenings) — (Material, Spec. No., Gr., Size, No.)
9. Constructed for max. allowable working pressure 344.5 Kpa at max. temp. 93 C Min. temp. (when less than −20 F) — C Hydrostatic, pneumatic, or combination test pressure 517 Kpa
10. Safety Valve Outlets: Number 1 Size 3" Location TOP OF VESSEL
11. Nozzles and Inspection Openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
SEE NOZZLE SCHEDULE								

12. Supports: Skirt — (Yes or no) Lugs — (No.) Legs — (No.) Other SADDLES (Describe) Attached BOTTOM WELDED (Where and how)
13. Remarks: —

2438 MM OD X 9144 MM LG 344.5 KPA
HORIZONAL VFH CWW ELECTROSTATIC TREATER VOL 46.2M³

CERTIFICATE OF COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.
Date July 2/80 Signed C.E. NATCO LIMITED (Manufacturer) by W.J. Mutton (Representative)
"U" Certificate of Authorization No. 1131 expires SEPT 9 1980

CERTIFICATE OF SHOP INSPECTION

Vessel made by CE. NATCO LIMITED at CALGARY
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of ALBERTA and employed by GOVERNMENT have inspected the pressure vessel described in this Manufacturers' Data Report on July 28 1980, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in the Manufacturers' Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
Signed — (Inspector) Date 80/07/28 Commissions — (Nat'l Board, State, Province and No.)

(1/78) This form (E00117) may be obtained from the Order Dept., ASME, 345 E. 47th St., New York, N.Y. 10017
S.O. 2724-V1