



the pressure equipment safety authority

BOILERS AND PRESSURE VESSELS
REPAIR OR ALTERATION REPORT

AB-40 (Side A) 2012-09

(A) #: 210398

OWNER EQUIP. NO: Natco Colt

REPAIR ORG. JOB NO:

REPAIR [X] and/or ALTERATION [ ] Partial [ ] Final [X]

1. Name of Organization doing Repair/Alteration Exact Offield Developing Ltd.

Address 1412 Tamarack Road N.E. Slave Lake AB AQP No. & Expiry Date 2172 April 17 / 2018

2. Name of Owner Canadian Natural Resources Ltd.

Address 2500-855 2 St. SW Calgary AB T2P 4J8

Location of Installation 12-0-81-22 W4 Central Cleaning Plant

3. Boiler/Pressure Vessel Description Tractor (Firetube) CRN E-8139.2

Manufacturer's Name CE Natco LTD. Year 1983 Serial No. L-10-191

4. Original Design Conditions:

a) Vessel/Shellside/Boiler: Max Allowable Working Press. 75 psi Min/Max Design Temp 283 F

b) Jacket/Tubeside: Max Allowable Working Press. Min/Max Design Temp /

5. New Design Conditions:

a) Vessel/Shellside/Boiler: Max Allowable Working Press. Min/Max Design Temp /

b) Jacket/Tubeside: Max Allowable Working Press. Min/Max Design Temp /

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

A portion of the hot side on firetube # NC129-02 is collapsed.

7. Original Code Edition and Addenda ASME Sect. VIII-I Year 1980 Addenda 1982

8. Code Edition and Addenda used for performing the work ASME Sect. VIII-I Year 2015 Addenda

9. Description of Work performed. (Step by step description of repair/alteration method used. Attach additional pages as required, and reference any additional documents used to provide the required information; such as repair or alteration procedures, drawings, and specifications)

Remove & Replace 3' of pipe for tube # NC129-02

All work to follow CNFG, Repair / Alteration Procedure

10. Heat Treatment: Preheat Temp 178 F Post Weld HT (Temp./Time) 1150 F / 1 hr. Other Bake Out 600F/1hr.

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

MPI prep ends. MPI root weld.

100% RT on butt welds

MPI completed welds before PWHT & 12 hr. after completion of work.

12. Pressure Test Vessel/Shellside/Boiler Tubeside/Jacket

a) Hydrostatic

b) Other Test

(A) #: 575050

OWNER EQUIP. NO. Treater E

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

Item	Material Specifications	Thickness / Schedule	Diameter	Item	Material Specifications	Thickness / Schedule	Diameter
Sheet/Drums				Heads/ Ends			
Tubesheet				Tubes	SA106 B	.500"	24"
Nozzles				Flanges/Fittings		Class	

14. Welding Procedures - Alberta Registration Number WP- 1093.2

WPS Numbers used: EOD-2-2

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

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

- a) Alteration Design Submission \_\_\_\_\_ b) Repair/Alteration Procedure: yes c) Material Control \_\_\_\_\_  
 d) Welding Control \_\_\_\_\_ e) NDE \_\_\_\_\_ f) Heat Treatment \_\_\_\_\_ g) Pressure Test \_\_\_\_\_

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

17. REMARKS: \_\_\_\_\_

**CERTIFICATE OF COMPLIANCE**

18. 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 and the AB-513.

a) For all items except for items identified in 16:  
Exact Oilfield Developing Ltd.

b) For items identified in 16 only:  
Canadian Natural Resources Ltd.

(Repair/Alteration Organization Name)  
2172 April 17 / 2018

(Owner/Client Organization Name)  
8039 June 30 / 2018

(AQP Number & Expiry Date)  
[Signature] Oct. 27 / 2015

(AQP Number & Expiry Date)

(Signature & Date)  
Len Hayne

(Signature & Date)

(Print Name)

(Print Name)

19. DATE WORK WAS COMPLETED: Oct. 27 / 2015

**CERTIFICATE OF INSPECTION**

20. 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 and the requirements established in AB-513.

a) In-service Inspector (ISI) Certification  
(When the repair is inspected by an ISI per the requirements established in AB-513)

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

Canadian Natural Resources 8039  
Owner-User/Inspection Company Name ACPS

ABSA SCO Signature & Date

In-Service Inspector Signature & Date

Print Name

Timothy Christopher Auld

In-Service Inspector Name (Please Print)

IBPV 206

In-Service Inspector Alberta Cert #

FORM U-1A MAI MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS  
 (Alternate Form for Single Chamber, Completely Shop-Fabricated Vessels Only)  
 as required by the provisions of the ASME Code rules, Section VIII, Division 1

AR10398  
 Sept 21/83  
 [Signature]

1. Manufactured and certified by CE Natco Limited 9423 Shepard Road S.E. Calgary, Alberta  
(Name and address of manufacturer)

2. Manufactured for Gulf Canada Resources Ltd. 401 9th Avenue S.W. Calgary Alberta  
(Name and address of purchaser)

3. Location of installation B-81-22-K4  
(Name and address)

4. Type: Horizontal L-10-191 E-8139.2 LA-9922-03 1983  
(Type or part name) (Mfg's serial no.) (CRN) (Drawing no.) (Part no. no.) (Year built)

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 Code, Section VIII, Division 1. 1980  
(Year)

Winox 02  
(Reference design) (Guide Code no.) (Refer to section 10 of UG-100)

6. Shell: SA-516-70 12.7mm/.500" 3.2mm/.125" 3048mm/10'-0" 12192mm/40'-0"  
(Mat'l spec. no., grades) (Nom thickness min) (Wall thickness max) (Dia. ID or O.D.) (Length overall ft & in)

7. Seams: Dbl-V-Butt spot 85 Dbl-V-Butt part spot  
(Type, welded, etc., segt loc, built) (RT spot or full) (RT temp. °F) (Reference) (Segt loc, built) (RT spot, full or NPS) (Segt loc, built)

8. Heads: (a) SA-516-70 (b) SA-516-70  
(Mat'l spec. no., grades)

Location (top, bottom, ends)	Welding Process	Corrosion Allowance	Crown Radius	Ribcote Radius	Original Ratio	Concave Outer Edge	Hemispherical Head	Flat Diameter	Side to Pressure (plan or contour)
(a) End	15.2mm	3.2mm	2896mm	184mm					Concave
(b) end	"	"	"	"					"

11. If removable, bolts used (describe other fastenings): 517 kPa  
(Year, size, no. of bolts) 776 kPa

9. MAWP: 75 at max. temp. 145 °C / 293 Min. temp. Hydro. press. or comb. test pressure 113  
(psia) (°F) (When less than -20°F) (psia)

10. Nozzles, inspection and safety valve openings

Purpose (relief, outlet, drain, etc.)	Size	Dia. or Size	Type	Mat'l	Nom. Thickness	Reinforcement Mat'l	How Attached	Location
relief	N6B	3"	RFWN	SA-106-B	.437"		welded	shell
relief	N6A	1.5"	"	"	"		welded	"
manway	M1	24"	FAB	"	.375"		"	"
manway	M4-M5	18"	RFWN	"	.500"		"	"

11. Supports: Skin No Lig None Leg None Other None Attached None Bolt Welded None  
(Type or size) (Material) (Height)

12. Remarks: Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:

3048mm X 12192mm @ 517 kPa WP  
(Name of cert. item number, etc. name and drawing title)

horizontal performax treater Vol. 94m<sup>3</sup>

ALBERTA L.P.C.  
 SEP 30 1983

CERTIFICATE OF SHOP 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. "U" Certificate of Authorization No. 311 Expires 6/30/86  
 Date Sept 21/83 Name CE Natco Limited Signed [Signature]  
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

Vessel constructed 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 the state or province of Alberta and employed by Government of Alberta have inspected the component described in this Manufacturers' Data Report on Sept 21, 1983 and state that to the best of my knowledge and belief, the manufacturer has constructed this pressure vessel in accordance with the 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 loss of any kind arising from or connected with this inspection.  
 Date Sept 21 1983 Signed [Signature] Commissioned [Signature]  
(Inspected Inspector) (Name) (Date) (State and No.)

POOR QUALITY





**Firetube Repair**  
In-Process Examination

1 Client: CNRL Central Cleaning Plant 12-9-81-22 W4

2 Tube ID: NC129-02 Natco Colt A# 210398

3 Required Repairs: Replace Damaged Pipe On Burner Side

4 Welder(s): Jeff White / Kim Lummerding WPS No: EOD-2-2

5 Bake Out Required? Yes X No         

Method: Stress Relieving Truck

6 PWHT Required? Yes X No         

Method: Stress Relieving Truck

**7 Joint Preparation, Fit Up & Inspection:**

Step	Activity	Initial	Date
1	Visual and MT Inspection of beveled ends	<i>JW</i>	15/10/20
2a	Joint Clearance <u>1/8</u>	<i>JW</i>	"
2b	External Alignment average high/low <u>0</u>	<i>JW</i>	"
2c	Internal Alignment average high/low <u>0</u>	<i>JW</i>	"

**8 Root Pass:**

Step	Activity	Initial	Date
1	Preheat <u>180F</u>	<i>JW</i>	15/10/21
2	Rods Used Type: <u>E6010</u> Size: <u>1/8</u>	<i>JW</i>	"
3	Visual Inspection of root pass (external)	<i>JW</i>	"
4	Visual Inspection of root pass (internal)	<i>JW</i>	"
5	MT Inspection of root pass	<i>JW</i>	"
6	Noted repairs completed		

**9 Fill & Cap:**

Step	Activity	Initial	Date
1	Preheat <u>182F</u> Interpass Temp: <u>272F</u>	<i>JW</i>	15/10/21
2	Rods Used Type: <u>E7018</u> Size: <u>5/32</u>	<i>JW</i>	"
3	Slag removal & weld condition between passes	<i>JW</i>	"
4	Visual and RT inspection of completed weld.	<i>JW</i>	"
5	Noted repairs completed		
6	12 hour post weld MT Inspection	<i>JW</i>	15/10/21



## Vessel Firetube Repair – Replacement of Damaged Sections

### Static Data Form

<b>Date:</b>	Oct. 19 / 2015	<b>CNRL Facility:</b>	Central Cleaning Plant
<b>Facility LSD:</b>	12-9-81-22 W4	<b>Vessel Description:</b>	Natco Colt
<b>A #:</b>	210398	<b>CRN:</b>	E-8139.2
<b>Vessel Serial #:</b>	L-10-191	<b>Firetube Material:</b>	SA 106 B
<b>Vessel MAWP:</b>	75 psi	<b>Firetube Thickness:</b>	.500 ( 24" ) Tube# NC129-02
<b>Owners Inspector:</b>	IRIS NDT	<b>Repair Organization:</b>	Exact Oilfield Developing Ltd.

**Scope of Work:**

Inspect and repair damaged section on the firetube by replacing 3' of the tube. Ensure firetube checklist is complete and correct before job completion. Ensure QC package is complete and sent to Ian Scully.

# Travel Sheet – Vessel Firetube Repair Tube# NC129-02

A#:	210398	Date:	Oct. 19 / 2015				
Vessel LSD:	12-9-81-22 W4	Facility:	Central Cleaning Plant				
Step #	Description of Step	CNRL Asset Integrity		Contractor		Owners Inspector	
		Action	Initial & Date	Action	Initial & Date	Action	Initial & Date
<b>Scope Sign-Off</b>							
		H					
<b>Vendor Qualification</b>							
Step 1	Ensure Vendor is Qualified	H			15/10/19		APD. Oct. 20/15
Step 2	Jurisdiction Notification	H			15/10/21		APD Oct. 20/15
<b>Cut-Out</b>							
Step 3	Mark Area				15/10/19		APD Oct. 20/15
Step 4	Perform UT						
Step 5	Move Area if Defects Found						
Step 6	Owners Inspector Approval				15/10/19		APD. Oct. 20/15
Step 7	Ensure Removal of LEL				"		APD. Oct. 20/15
Step 8	Perform Cut				"		APD. Oct. 20/15
<b>Weld Preparation</b>							
Step 9	Joint Prep as per WPS				15/10/20		APD. Oct. 21/15
Step 10	Surface Prep				"		APD. Oct. 21/15
Step 11	Weld Area MPI for Discontinuities				"		APD. Oct. 21/15
<b>Hydrogen Bake Out</b>							
Step 12	Perform Bake-Out (If Required)				15/10/19		APD. Oct. 21/15
Step 13	Heating Method for Bake-Out S.R. Truck				"		APD. Oct. 21/15
Step 14	Substitution of Induction Coils						
<b>Welding</b>							
Step 15	Pre-Heat				15/10/20, 21		APD. Oct. 21/15
Step 16	New Electrodes				"		APD. Oct. 21/15
Step 17	Owners Acceptance of Fit-Up				15/10/20		APD. Oct. 21/15
Step 18	Approved WPS	H			15/10/20		APD. Oct. 21/15
Step 19	Inspect Root Weld				15/10/21		APD. Oct. 21/15
Step 20	Completion of Weld				"		APD. Oct. 21/15
Step 21	MT of final weld				"		APD. Oct. 21/15
Step 22	PWHT				15/10/26		APD. Oct. 22/15
Step 23	Slow Cool				"		APD. Oct. 22/15
<b>Post-Weld Non-Destructive Examination (NDE)</b>							
Step 24	Completion of Radiography				15/10/21		APD. Oct. 21/15
Step 25	12 Hour MT				15/10/27		APD. Oct. 28/15
Step 26	No Hydrotest						
<b>Documentation</b>							
Step 27	Completion of Contractor Documentation				15/10/27	H	(A Oct 31/15)
Step 28	Owners Inspector Signs Jurisdictional Docs				"	H	(A Oct 31/15)
Step 29	File final QC Package and update Maxtrak	H					

Action Required: H = Hold Point, W = Witness Point, R = Review Point

<b>Final Sign-Off</b>	
Contractor:	Owners Inspector:



# Canadian Natural

Procedure Number: TC-OVR-PRO-INT-000014

## Owner User Program – Pressure Vessel Repair Procedure Vessel Firetube Repair - Replacement of Damaged Sections

### Contents

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### Revision History

Date	Revision	By	Chk	Approver
August 14, 2014	1	IS	AM	AM
Nov 24, 2014	0	AM	KM	AM



## Scope

Installation of replacement section of severely pitted, corroded or collapsed firetube from ASME Section VIII Division I pressure vessel constructed of P-I Group 1 or 2 materials. Note that due to the high likelihood of repeat failure, all repairs on vessel firetubes must be post-weld heat treated (PWHT) regardless of whether the firetube was PWHT at time of manufacture.

Materials shall be of the same specification, grade, and dimensions as defined in the manufacturer's original registered design.

Note that due to the high likelihood of repeat failure, repairs on firetubes are typically post-weld heat treated (PWHT) regardless of whether the firetube was PWHT at time of manufacture. There are some exemptions to this rule (south-east Saskatchewan) - the failure mode of firetubes is internal corrosion due to the use of sour natural gas in the burners and not cracking due to stresses. Confirm with the area Asset Integrity Lead if in doubt as to the requirement to perform PWHT.

## Procedure

### Vendor Qualification

1. CNRL Owner's Inspector must review Contractor's Quality Control Program, welding procedures, and welder qualifications prior to the start of the repair. Any concerns must be brought the attention of the CNRL Integrity group.

### Jurisdiction Notification

2. The applicable Jurisdictional Authority (ABSA, BCSA, TSASK) is to be notified prior to beginning repair activities.

### Cut-Out

3. Define the area to be removed.
4. Perform UT of the cut area to determine if any laminations or discontinuities exist.
5. If laminations or discontinuities are identified, move the cut out area to attempt to avoid these defects.
6. Owner's Inspector shall approve the layout of the area to be removed prior to the initial cut being made.
7. Make sure the firetube has been sanitized and there are no explosive environments present.
8. Perform the cut.

### Weld Preparation

9. The joint preparation shall be in accordance with the contractor's registered WPS.
10. The surface shall be cleaned to white metal for a distance of 10 mm beyond the expected weld area.
11. The weld area shall be MPI (where practical Wet Fluorescent MPI) examined for laminations and surface discontinuities. If laminations or surface discontinuities are identified they shall be brought to the attention of the Asset Integrity representative.

### Hydrogen Bake Out and Sulfur Removal

**Note:** Indicate "NA" on the Travel Sheet if not required – usually because the vessel has not been in sour service

12. Vessels that have been exposed to sour or sulfur bearing process streams shall required the weld attachment area to undergo a "Bake Out" procedure. This procedure shall consist of heating the weld attachment area and 10 cm on each side to 315°C (600°F) for and holding that temperature for a minimum of 60 minutes. Bake out should be done prior to cutting out, if cutout is done thermally. Stipulate controls methods.
13. Bake Out is performed by either induction coil (use thermocouples as control instrumentation) or propane torch (use temperature-sensitive crayons – upper and lower temperature to be controlled). Oxyacetylene torches are not acceptable.

14. If induction coils are used, a 250°C (482°F) four-hour heat treatment may be substituted for the normal 450°C (842°F) one-hour heat treatment.

## Welding

15. Minimum pre-heat shall be 80°C (176°F) for a 100 mm band on both sides of the weld attachment area.
16. The CNRL Inspector shall witness seal on the box being broken and ensure that once the box has been opened the electrodes are stored in an oven.
17. The CNRL Inspector shall approve the alignment and fit-up of the replacement section with only the tack welds in place.
18. Welding shall be in accordance with the contractor's registered WPS utilizing new E 7018-1 electrodes. The WPS is to be approved by CNRL prior to use.
19. Inspect root weld using dry powder MT.
20. Complete the butt welds. No down hand welding shall be used.
21. Perform dry powder or black on white MT of the final weld.
22. Perform post weld heat treatment (PWHT). If firetube was PWHT at time of manufacture, perform PWHT as per U1A. If firetube was not PWHT at time of manufacture, perform PWHT by heating to 620°C (1150°F) and holding for 1 hour. PWHT may be performed by either oven or stress-relief truck. Heating rates shall be as per ASME Section VIII Division 1. Refer to the comments in the "Scope" for further information.
23. After PWHT, the weld area shall be wrapped with an insulating blanket and allowed to slow cool to 100°C (212°F). The cooling rate shall not exceed 260°C (500°F) / hour.

## Post Weld Non-Destructive Examination (NDE)

24. Perform MT of the final weld 12 hours after completion if the weld does not require post weld heat treatment (PWHT). If PWHT is required, perform MT after the weld has cooled prior to PWHT and repeat the MT 12 hours after PWHT is completed.
25. Complete 100% RT of butt weld joints.
26. No hydro-test is required.

## Documentation

**Note:** The travel sheet included within this Procedure will be used to document the repair activities. Mandatory "hold" points have been provided, others will be identified depending on the job scope.

27. The CNRL Inspector must make sure that Contractor has completed required QC documentation and jurisdictional documents. The Contractor performing the work may use their own Travel Sheet as per their Quality Control program but the process is to meet all CNRL requirements as per this Procedure.
28. The Travel Sheet provides for the identification of Hold, Witness and Review points to be assigned by CNRL Asset Integrity, the Contractor performing the work and the CNRL Inspector.

**Hold Point:** work does not proceed beyond this unless approved by the party assigning the action.

**Witness Point:** work may proceed but at some time during the process will be "witnessed" by the party assigning the action.

**Review Point:** work may proceed - identifies the need to review documents such as inspection reports, test reports, mill test reports, etc..

**NA:** identifies a step in a generic procedure that is not applicable to the work being performed.

29. Typically the process for assigning actions (done prior to the start of work) is as follows:
  - Contractor identifies their action items – typically all steps are considered to be "Hold Points" for the Contractor/Fabricator.
  - CNRL Asset Integrity representative identifies action items.
  - CNRL Inspector identifies action items per discussion and agreement with the CNRL Asset Integrity representative.

There is no set rule in regards to the action items that are assigned by the CNRL Asset Integrity representative or the CNRL Inspector but sufficient actions are to be assigned to ensure a quality product is produced by the Contractor. A developed level of trust based on familiarity of the Contractor's work may influence the level of involvement by Asset Integrity and the CNRL Inspector.

30. The CNRL Inspector must sign off the jurisdictional documents and make sure one copy is submitted to the jurisdictional authority and one is included in the QC package.
31. CNRL Asset Integrity is to update the equipment database (Maxitrak) to reflect repair activities. The final QC package may be retained (hard copy or electronic) at the regional business office or off-site storage facilities. Records are to be kept for the life of the equipment.

**Note:** "CNRL Inspector" refers to a pressure equipment Inspector (staff or contract) that has the required Jurisdictional certifications to perform the required inspections and to certify the applicable Jurisdictional documents.

**Alberta:** Inspectors who inspect and certify repairs to boilers and pressure vessels must hold an Alberta In-service Inspector certification. API510 certified Inspectors may assist (but not certify) as per the CNRL OUP.

**British Columbia:** Inspection and certification shall be made by an Inspector holding the appropriate commission issued by the National Board and employed by an Authorized Inspection Agency (BCSA).

**Saskatchewan:** Inspectors who inspect and certify repairs to boilers and pressure vessels must hold a Saskatchewan Pressure Equipment Inspector's License Class 1 (boilers and pressure vessels) or Class 2 (pressure vessels only). API510 certified Inspectors may assist (but not certify) as per the CNRL OUP.

**Procedure:** 5.0      **Rev. 0**  
**Technique:** MT-1V Red Dry Magnetic Particle  
**Code:** ASME B31.3 - Chp 6 - Sect 341.3.2(a) 344.6.2  
**Other:**

**Client:** CNRL - EXACT OILFIELD      **Date:** 21-Oct-15  
**IRISNDT #:** EDM1508512      **Other:** CC80029549.6050.  
**Location:** Slave Lake Fab. Shop      **AFE #:** TBA  
**Item Inspected:** Piping Repair/Replace of FireTube # NC129-02

**Surface Condition:** Painted  Sandblasted  Machined  As Cast  As Forged  Weldment  Other

**Material:** Carbon Steel      **Thickness:** N/A      **Heat Treatment:** N/A

**Magnetizing Equipment:** Yoke  Coil  Permanent  IRISNDT #: 40197      **Mfg:** 936      **Calibration Date:** 21-Sep-15

**Method of Magnetization:** AC  DC  Continuous

**Blacklight:** Y  N/A  IRISNDT #:      **Blacklight Meter:** IRISNDT #:  
 Verification per ASME V Art 7 T.777.2      Calibration Date: - -

**Whitelight:** Y  N/A  Verification per ASME V Art 7 T.777.1      **Lighting Equipment:** Yoke Light (10W)

**Magnetic Particles:** Dry  Wet  Red  Grey  Black  Fluorescent   
 Batch #: 1178-58      **Mfg:** Magnaflux      **Type:** 8A

**Background:**  Batch #:      **Mfg:**      **Type:**

**Inspection Scope:**

To perform a Dry Red Visible MPI on 2 – root pass and its bevel preps of Fire Tube # NC129-02.

**Detail:**

Equipment No. FireTube #  
Weld Type: BW

Weld No.	Welder ID
1	2, K
2	2, K

**Inspection Result:**

No apparent indication found at the time of inspection



Overview of FireTube # NC129-02

**Inspection Limitation(s):**

Unit#: 491      Kilometers: _____ In: _____ Out: _____ Hrs: _____ In: _____ Out: _____ Hrs: _____ Personnel: AMD	Consumables: _____	Interpretation by: Armando M. Delumen      SNT-TC-1A: 2 (Print)      (Level) _____      C.G.S.B. #: 11782 (Signature)      Client Representative: <b>LEN HAYNE ( Exact )</b> (Print) I am in full agreement with report contents      (Sign) _____
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# IRISNDT

## MAGNETIC PARTICLE INSPECTION REPORT

CA0172-MT-9  
Page 1 of 1

**Procedure:** 5.0 Rev. 0  
**Technique:** MT-1V Red Dry Magnetic Particle  
**Code:** ASME B31.3 - Chp 6 - Sect 341.3.2(a) 344.6.2  
**Other:**

**Client:** CNRL - EXACT OILFIELD  
**IRISNDT #:** EDM1508512  
**Location:** Slave Lake Fab. Shop  
**Item Inspected:** Piping Repair/Replace of FireTube # NC129-02

**Date:** 21-Oct-15  
**Other:** CC80029549.6050.  
**AFE #:** TBA

**Surface Condition:** Painted  Sandblasted  Machined  As Cast  As Forged  Weldment  Other

**Material:** Carbon Steel Thickness: N/A Heat Treatment: N/A

**Magnetizing Equipment:** Yoke  Coil  Permanent  IRISNDT #: 40197 Mfg: 936 Calibration Date: 21-Sep-15

**Method of Magnetization:** AC  DC  Continuous

**Blacklight:** Y  N/A  IRISNDT #: Verification per ASME V Art 7 T.777.2  
**Blacklight Meter:** IRISNDT #: Calibration Date: - -

**Whitelight:** Y  N/A  Verification per ASME V Art 7 T.777.1  
**Lighting Equipment:** Yoke Light (10W)

**Magnetic Particles:** Dry  Wet  Red  Grey  Black  Fluorescent   
 Batch #: 1178-58 Mfg: Magnaflux Type: 8A

**Background:**  Batch #: Mfg: Type:

**Inspection Scope:**

To perform a Dry Red Visible MPI on 2 – final weld cap of Fire Tube # NC129-02.

**Detail:**

Equipment No. FireTube # NC129-02  
Weld Type: BW

Weld No.	Welder ID
1	2, K
2	2, K

**Inspection Result:**

No apparent indication found at the time of inspection



Overview of FireTube # NC129-02



View of 2-butt weld

**Inspection Limitation(s):**

Unit#: 491 Kilometers: _____ In: _____ Out: _____ Hrs: _____ In: _____ Out: _____ Hrs: _____ Personnel: AMD	Consumables: _____	Interpretation by: Armando M. Delumen SNT-TC-1A: 2 (Print) C.G.S.B.: 2 (Level) C.G.S.B. #: 11782 (Signature) Client Representative: <b>LEN HAYNE ( Exact )</b> (Print) I am in full agreement with report contents (Sign)
---	--------------------	--

5311-86 Steet, Edmonton, Alberta T6E 5T8 Phone: (780) 437-2022 fax: (780) 436-4873

Calgary (403) 279-6121	Cold Lake (780) 826-6105
Lloydminster (780) 875-6455	Fort McMurray (780) 743-1536
Barrhead (780) 674-3018	Red Deer (403) 347-1742
Nisku (780) 955-7616	

www.irisndt.com

Engineering, Calgary (403) 217-9684  
 Engineering, Edmonton (780) 437-2022  
 Rope Access Services (780) 437-2022  
 Offices also located in USA and UK

<b>Procedure:</b> 5.0	Rev. 0	<b>Client:</b> CNRL - EXACT OILFIELD	<b>Date:</b> 21-Oct-15
<b>Technique:</b> MT-2V Wet Visible Magnetic Particle		<b>IRISNDT #:</b> EDM1508512	<b>Other:</b> CC80029549.6050
<b>Code:</b> Client Inforation		<b>Location:</b> Slave Lake Fab. Shop	<b>AFE #:</b> TBA
<b>Other:</b>		<b>Item Inspected:</b> Piping Repair of FireTube # NC129-02	

<b>Surface Condition:</b>	Painted <input type="checkbox"/>	Sandblasted <input type="checkbox"/>	Machined <input type="checkbox"/>	As Cast <input type="checkbox"/>	As Forged <input type="checkbox"/>	Weldment <input checked="" type="checkbox"/>	Other <input type="checkbox"/>
<b>Material:</b> Carbon Steel				<b>Thickness:</b> N/A	<b>Heat Treatment:</b> Yes		
<b>Magnetizing Equipment:</b>	Yoke <input checked="" type="checkbox"/>	Coil <input type="checkbox"/>	Permanent <input type="checkbox"/>	IRISNDT #: 40197	Mfg: 936	Calibration Date: 21-Sep-15	
<b>Method of Magnetization:</b>	AC <input checked="" type="checkbox"/> DC <input type="checkbox"/> Continuous <input checked="" type="checkbox"/>						
<b>Blacklight:</b> Y <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	IRISNDT #:	<b>Blacklight Meter:</b>			IRISNDT #:	Calibration Date: - -	
Verification per ASME V Art 7 T.777.2							
<b>Whitelight:</b> Y <input checked="" type="checkbox"/> N/A <input type="checkbox"/>	Verification per ASME V Art 7 T.777.1	<b>Lighting Equipment:</b> Yoke Light (10W)					
<b>Magnetic Particles:</b>	Dry <input type="checkbox"/> Wet <input checked="" type="checkbox"/>	Red <input type="checkbox"/>	Grey <input type="checkbox"/>	Black <input checked="" type="checkbox"/>	Fluorescent <input type="checkbox"/>		
	Batch #: 1331-525	Mfg: Ardrex	Type: 7C				
<b>Background:</b> <input checked="" type="checkbox"/>	Batch #: 1425	Mfg: Ardrex	Type: 8901W				

**Inspection Scope:**

To perform a Wet Visible MPI on all existing welds of Fire Tube #NC129-02

**Details:**

Equipment No. FireTube # NC129-02  
Weld Type: BW and Fillet on tubesheet

**Inspection Result:**

No crack or crack like indication were found at the time of inspection



Overview of Fire Tube # NC129-02

**Inspection Limitation(s):**

Unit#: 491	Kilometers: _____	Consumables:	Interpretation by:
In: _____ Out: _____ Hrs: _____			Armando M. Delumen SNT-TC-1A: 2
In: _____ Out: _____ Hrs: _____			(Print)
Personnel:			C.G.S.B.: 2
AMD			(Level)
			C.G.S.B. #: 11782
			(Signature) <i>Armando M. Delumen</i>
			Client Representative: (Print) <b>LEN HAYNE (Exact)</b>
			I am in full agreement with report contents (Sign) <i>Len Hayne</i>

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Barrhead (780) 674-3018	Red Deer (403) 347-1742	Rope Access Services (780) 437-2022
Nisku (780) 955-7616		Offices also located in USA and UK

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**Procedure:** 5.0 Rev. 0  
**Technique:** MT-2V Wet Visible Magnetic Particle  
**Code:** ASME B31.3 - Chp 6 - Sect 341.3.2(a) 344.6.2  
**Other:**

**Client:** CNRL - EXACT OILFIELD  
**IRISNDT #:** EDM1508512  
**Location:** Slave Lake Fab. Shop  
**Item Inspected:** Piping Repair of FireTube # NC129-02

**Date:** 27-Oct-15  
**Job #:** TBA  
**AFE #:** CC80029549.6050.10

**Surface Condition:** Painted  Sandblasted  Machined  As Cast  As Forged  Weldment  Other

**Material:** Carbon Steel Thickness: N/A Heat Treatment: Yes

**Magnetizing Equipment:** Yoke  Coil  Permanent  IRISNDT #: 40197 Mfg: 936 Calibration Date: 21-Sep-15

**Method of Magnetization:** AC  DC  Continuous

**Blacklight:** Y  N/A  IRISNDT #: Verification per ASME V Art 7 T.777.2  
**Blacklight Meter:** IRISNDT #: Calibration Date: - -

**Whitelight:** Y  N/A  Verification per ASME V Art 7 T.777.1  
**Lighting Equipment:** Yoke Light (10W)

**Magnetic Particles:** Dry  Wet  Red  Grey  Black  Fluorescent   
 Batch #: 1331-525 Mfg: Ardrex Type: 7C

**Background:**  Batch #: 1425 Mfg: Ardrex Type: 8901W

**Inspection Scope:**

To perform a Wet Visible MPI on 2 – Final weld caps of repaired FireTube # NC129-02 after PWHT

**Details:**

Equipment No. FireTube # NC129-02  
Weld Type: BW

Weld No.	Welder ID
1	2, K
2	2, K

**Inspection Result:**

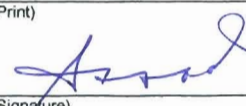

No apparent indication found at the time of inspection

**Note:** Post 12 hours.



Overview of FireTube # NC129-02

**Inspection Limitation(s):**

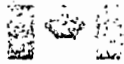
Unit#: 491 Kilometers: _____ In: _____ Out: _____ Hrs: _____ In: _____ Out: _____ Hrs: _____ Personnel: AMD	Consumables: _____	Interpretation by: Armando M. Delumen SNT-TC-1A: 2 (Print)  (Signature) Client Representative: LENO HAYNE ( Exact ) (Print) I am in full agreement with report contents (Sign) 
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Natural Resources  
Canada

Ressources naturelles  
Canada



Name/ **Blaine S. Gullion**  
Nom  
Reg. No./ **7233**  
No. matricule  
Issue Date/ **2012/12/10**  
Date d'émission

This card does not identify the stated individual to be an employee or representative of Natural Resources Canada, Government of Canada.  
Cette carte n'identifie pas l'individu d'être un employé ou un représentant de Ressources naturelles Canada, Gouvernement du Canada

Corrective lenses for | | near | | far vision.  
Verres correctifs pour la vision de | | près | | distance.

Signature | 



Natural Resources  
Canada

Ressources naturelles  
Canada

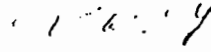
Certified to/ Certifié selon : CAN : CGSB-48.97.12

7233

Method Méthode	Level Niveau	Sector Secteur	Cert. Date Date cert.	Date recert. Date recert.	Expires Expiration
MT	2	EMC	2004/06/01		2015/12/31
PT	2	EMC	2011/08/12		2015/12/31
RT	2	EMC	1998/08/20		2015/12/31

For verification of certification status, policies and definitions, visit website:  
<http://ndt.nrcan.gc.ca/> Pour la vérification de la certification, les politiques, et les définitions,  
visitez le site-web: <http://ndt.nrcan.gc.ca/>

Manager, Certifying Agency  
Gestionnaire, Organisme de certification





**VISION ACUITY RECORD**

Name: Blaine Gullion Employee #: 665389

**Vision Acuity Results**

**Near Vision Requirements**  
Required for All Personnel

	<u>Left Eye</u>	<u>Right Eye</u>
Uncorrected	J - 1 @ 12"	J - 1 @ 12"
Corrected	J - @ " "	J - @ " "

Check one of the following:

Satisfactory Near Vision **Without** Corrective Lenses (J-1 minimum required in at least one eye).

Satisfactory Near Vision **With** Corrective Lenses (J-1 minimum required in at least one eye).

Unsatisfactory Near Vision

---

Check if applies:

Reading card has been verified IAW 8.1.2.1 of 33.G.103-S8 for personnel certifying to 33.G.103-S4 (CP-189/ASME XI)

**Distance Vision Requirements**  
Branch is Required to Determine Applicability

	<u>Left Eye</u>	<u>Right Eye</u>
Uncorrected	20/ Snellen	20/ Snellen
Corrected	20/ Snellen	20/ Snellen

Check one of the following:

Satisfactory Distance Vision **Without** Corrective Lenses (20/30 Snellen minimum required in at least one eye).

Satisfactory Distance Vision **With** Corrective Lenses (20/30 Snellen requirement in at least one eye).

Unsatisfactory Distance Vision

N/A (Branch determined non-applicable by Code or contractual agreements)

**Color Vision Requirements**  
Required for All Personnel (Use Form 103.10a "Color Vision Examination Charts")

Satisfactory - Can differentiate between colors or shades of gray used in method(s)

Unsatisfactory - Cannot differentiate between colors or shades of gray used in method(s)

Deficiencies/Limitations: None

Limitations reviewed and approved by Responsible Level 3 for NAS410 personnel.

Responsible Level 3 Signature \_\_\_\_\_

**Brightness Discrimination Requirements**  
Branch is Required to Determine Applicability

Check all that apply:

N/A     Satisfactory     Unsatisfactory     Corrective Lenses Required

Remarks/Restrictions:

<u>Administered By:</u>		<u>Reviewed &amp; Approved By:</u>	
Signature: _____	<input checked="" type="checkbox"/> NDT Level III Signature: _____	Signature: _____	<input checked="" type="checkbox"/> NDT Level III Name: _____
Name: <u>Stan Banner</u>		Name: <u>Stan Banner</u>	
Location: <u>Edmonton</u>	Date: _____	Date: <u>3-Nov-14</u>	
Date: <u>3-Nov-14</u>	Next Examination Date: _____	Next Examination Date: <u>3-Nov-15</u>	

# Welder's Log

Exact Oilfield Developing Ltd.

"B" Pressure Welder's Log Control

Welder's Name Welder's Symbol	Ticket #	File #	P Number	F Number	Process	WPS Qualified To	Positions Qualified To	Thickness Range Qualified To	Minimum Pipe Diameter Qualified To	Expiry Date Of Ticket
Uphill	# 22503	W-10793	P-1 - P-15F	F-3 F-4	SMAW	EOD-1-3	All	.250" - .622"	1" OD	Aug. 20/2017
Kim Lummerding "K"	# 22504	W-10793	P-1 - P-15F	F-3	SMAW	EOD-CSA-2	All	0.436"	1" OD	Aug. 20/2017
"3"	# 19850	W-10234	P-1 - P-15F	F-3 F-4	SMAW	EOD-CSA-2	All	.250" - .186"	1" OD	Nov. 13/2015
David Edwards Uphill	# 19849	W-10234	P-1 - P-15F	F-3 F-4	SMAW	EOD-1-3	All	.104" - Max	1" OD	Nov. 13/2015
Uphill	# 22755	W-19732	P-1 - P-15F	F-3 F-4	SMAW	EOD-1-3	All	.104 - Max	1" OD	Oct. 26/2017
Carmen Conrad "J"	# 22753	W-19732	P-1 - P-15F	F-3 F-4	SMAW	EOD-CSA-2	All	.188" - .250"	1" OD	Oct. 26/2017
Uphill	# 20140	W-21515	P-1 - P-15F	F-6 F-4	GTAW/SMAW	EOD-8	All	.250 - .438	1" OD	Jan. 22/2016
	# 21651	W-21515	P-1 - P-15F	F-6 F-5	GTAW/SMAW	EOD-3-1	All	.250" - .438"	1" OD	Jan. 29/2017
	# 21649	W-21515	P-1 - P-15F	F-3 F-4	SMAW	EOD-1-3	All	.104" - Max	1" OD	Jan. 29/2017
	Robin Edwards "R"	# 21989	W-21515	P-1 - P-15F	F-3 F-4	SMAW	EOD-CSA-2	All	.188" - .500"	1" OD
Uphill	# 21317	W-21857	P-1 - P-15F	F-3 F-4	SMAW	EOD-1-3	All	.250" - Max	1" OD	Oct. 28/2016
Jeff White "2"	# 21318	W-21857	P-1	F-3	SMAW	EOD-CSA-2	FV/O	0.864	2.875"	Oct. 28/2016
Uphill	# 19844	W-17894	P-1 - P-15F	F-6 F-5	GTAW/SMAW	EOD-9	All	.250" - .438"	1" OD	Nov. 12/2015
	# 19843	W-17894	P-1 - P-15F	F-6 F-4	GTAW/SMAW	EOD-8	All	.250" - .622"	1" OD	Nov. 12/2015
	Brent Ghostkeeper "G"	# 19842	W-17894	P-1 - P-15F	F-3 F-4	SMAW	EOD-1-3	All	.104" - Max	1" OD
Tricia McNab "T"	# 21255	W-27452	P-1 - P-15F	F-3 F-4	SMAW	EOD-1-3	All	.104" - Max	1" OD	Oct. 8/2016
Ryan Field "F"		W-33200	P-1 To P-1	F3 F4	SMAW	EOD-1-3	All	6mm - 16mm	2.5" OD	Aug. 6/2017

GRB Enterprises Ltd  
Edmonton Alberta

AOQP 7107(C)

WELDER PERFORMANCE QUALIFICATION CARD

Name Jeff White W-21857  
ABSA File Number

This card is issued pursuant to the Safety Codes Act and the Pressure Welders Regulation. The performance qualification is in accordance with Section IX of the ASME BPV Code and subject to the limitations on the reverse side.

Date of Test 28 Oct 2014  
Welder Signature [Signature]  
GRB Card No. 21317  
Welding Examiner (Print/Type) Steve Jones

Performance Qualification GRB Card No. 21317

Process(es) SMAW SMAW Materials (P.No.) P1 thru P15F  
Filler Metal (F.No) F3 F4 Min. Outside Pipe Diameter 1" CA  
Max Deposited Weld Metal .250" MAX 1/16" Position(s) Qualified ALL  
Backing without/with With Backing Gas NA  
Progression Uphill Uphill #E00 339  
P.Q. Expiry Date 28 Oct 2016 Welding Examiner Signature [Signature]

GRB Enterprises Ltd  
Edmonton Alberta

AOQP 7107(C)

WELDER PERFORMANCE QUALIFICATION CARD

Name Jeff White W-21857  
ABSA File Number

This card is issued pursuant to the Safety Codes Act and the Pressure Welders Regulation. The performance qualification is in accordance with Section IX of the ASME BPV Code and subject to the limitations on the reverse side.

Date of Test 28 Oct 2014  
Welder Signature [Signature]  
GRB Card No. 21318  
Welding Examiner (Print/Type) Steve Jones

Performance Qualification GRB Card No. 21318

Process(es) SMAW - Materials (P.No.) P1  
Filler Metal (F.No) F3 - Min. Outside Pipe Diameter 2 7/8"  
Max Deposited Weld Metal .864" - Position(s) Qualified F.V.O  
Backing without/with - Backing Gas NA  
Progression Downhill - #E00 339  
P.Q. Expiry Date 28 Oct 2016 Welding Examiner Signature [Signature]

**Performance Qualification GRB Card No. 22504**

Process(es) SMAW - Materials (P.No.) P1 thru P15F

Filler Metal (F.No) F3 - Min. Outside Pipe Diameter 1" OD

Max Deposited Weld Metal 436" - Position(s) Qualified ALL

Backing without / with - Backing Gas NA

Progression Downhill - #E00 339  
Examiner File No.

20 Aug 2017 SJA  
P.Q. Expiry Date Welding Examiner Signature

**Performance Qualification GRB Card No. 22503**

Process(es) SMAW SMAW Materials (P.No.) P1 thru P15F

Filler Metal (F.No) F3 F4 Min. Outside Pipe Diameter 1" OD

Max Deposited Weld Metal 250" 622" Position(s) Qualified ALL

Backing without / with with Backing Gas NA

Progression Downhill Uphill #E00 339  
Examiner File No.

20 Aug 2017 SJA  
P.Q. Expiry Date Welding Examiner Signature

**GRB Enterprises Ltd**  
**Edmonton Alberta** AOQP 7107(C)  
**WELDER PERFORMANCE QUALIFICATION CARD**

Name KIM LUMMERding W-10793  
ABSQA File Number

Name Steve Jones  
Welding Examiner (Print/Type)

This card is issued pursuant to the Safety Codes Act and the Pressure Welders Regulation. The performance qualification is in accordance with Section IX of the ASME BPV Code and subject to the limitations on the reverse side.

20 Aug 2015  
Date of Test

[Signature]  
Welder Signature

22504  
GRB Card No

**GRB Enterprises Ltd**  
**Edmonton Alberta** AOQP 7107(C)  
**WELDER PERFORMANCE QUALIFICATION CARD**

Name KIM LUMMERding W-10793  
ABSQA File Number

Name Steve Jones  
Welding Examiner (Print/Type)

This card is issued pursuant to the Safety Codes Act and the Pressure Welders Regulation. The performance qualification is in accordance with Section IX of the ASME BPV Code and subject to the limitations on the reverse side.

20 Aug 2015  
Date of Test

[Signature]  
Welder Signature

22503  
GRB Card No

### Mill Test Certificate

Product: Seamless Carbon Steel Pipe      Product Heat Number: **BSM-0829**      Product Size: **NPS 24 XS**      Production Date: **April 10, 2013**  
 Production Method: Hot Expansion      Product Heat Treatment: As-rolled  
 Product Standards: ASME B36.10-2004, API 5L-44th Ed. Grade B PSL1, ASTM/ASME A/SA106-2011 Grade B NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010

Product Markings: .BRI-STEEL MFG <API> 5L-0898 API 5L GR B PSL1 ASTM/ASME A/SA106 GR B A/SA53 GR B NPS 24 XS 0.5 InchWT HEAT BSM-0829 (PIPE # LENGTH MASS) 125.5lb/ft NDE 970 PSI SMLS NACE MR0175 2013/04 MADE IN CANADA.

Product Details						Non-Destructive Testing									
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Geiger $\mu$ R/hr	Res.Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 970 psi/5s	End Condition	
BSM-0829	Heat	NPS 24 XS 0.5 in.WT	17	DRL	125.50	<5	<20	Pass	Pass	Pass	Pass	Pass	Pass	37.5° Bevel	

Chemical Analysis (wt%)																		
Heat	Steelmaking Method	Analysis	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE (IIW)	CE (CSA)	
BSM-0829	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.19	0.88	0.013	0.010	0.25	0.05	0.06	0.02	-	-	-	-	0.0003	-	-	
		Product	0.20	0.88	0.015	0.013	0.25	0.05	0.06	0.02	0.03	0.002	0.001	0.001	0.0002	0.37	0.38	

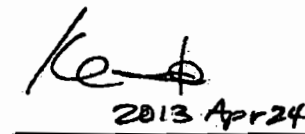
Mechanical Properties										
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
					50mm GL	Longitudinal; 38.1mm x WT				
BSM-0829	Heat	Ferrite & Pearlite	77	Pass		Longitudinal; 38.1mm x WT	49,200	69,500	0.71	46

Heat	Test Standard	Impact Test Sample Details	Temp $^{\circ}$ C	Impact Energy				% Shear				Lateral Expansion					
				J	J	J	AVG	%	%	%	AVG	mm	mm	mm	AVG		
BSM-0829	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Additional Details:**

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-44th Ed., ASTM/ASME A/SA106-2011, A/SA53-2012, and the purchase order requirements, and that the results meet the corresponding requirements.
- ✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3: Sour Service, and NACE MR0103-2010 Section 2.1.
- ✓ No weld repairs have been performed on this product.
- ✓ This product has not come into contact with mercury during the Bri-Steel Manufacturing processes.
- ✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Mill Test Certificate approved by:



Kenton Dechant, P.Eng.  
 Manager of Quality and R&D



R&R Stress Relieving Service Ltd.  
2103 - 6th Street  
Nisku AB T9E 7X8

DATE: 19 OCTOBER 2015

CHART / JOB NO: 01/

CLIENT: EXACT

LOCATION: EXACT, SLAVE LAKE, AB

PROJECT: CNRL CENTRAL CLEANING PLANT  
LSD: 12-9-81-23W4



# R&R Stress Relieving Service Ltd.

2103 – 6<sup>th</sup> Street, Nisku AB T9E 7X8

780-955-7559 \* [www.rrstress.com](http://www.rrstress.com)

## CERTIFICATE OF CALIBRATION AND CONFORMANCE

CERTIFIED BY:	R&R Stress Relieving Service
TEST NUMBER:	RR064B
DATE:	September 1, 2015
DATE DUE:	December 1, 2015
MANUFACTURER:	Chino
MODEL NO.	AH-3745 N00
SERIAL NO.	AH-082Q163
RECORDER NUMBER	IR-188

**This instrument has been calibrated and is within the manufacturers specifications.**

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### REFERENCE STANDARDS

**DIGIMITE 311600; SERIAL NO. 48430-5522; CERTIFICATION DATE: December 11, 2014**

**GORDON 5060 CALIBRATOR; SERIAL NO. 028-8427113; CERTIFICATION DATE: December 11, 2014**

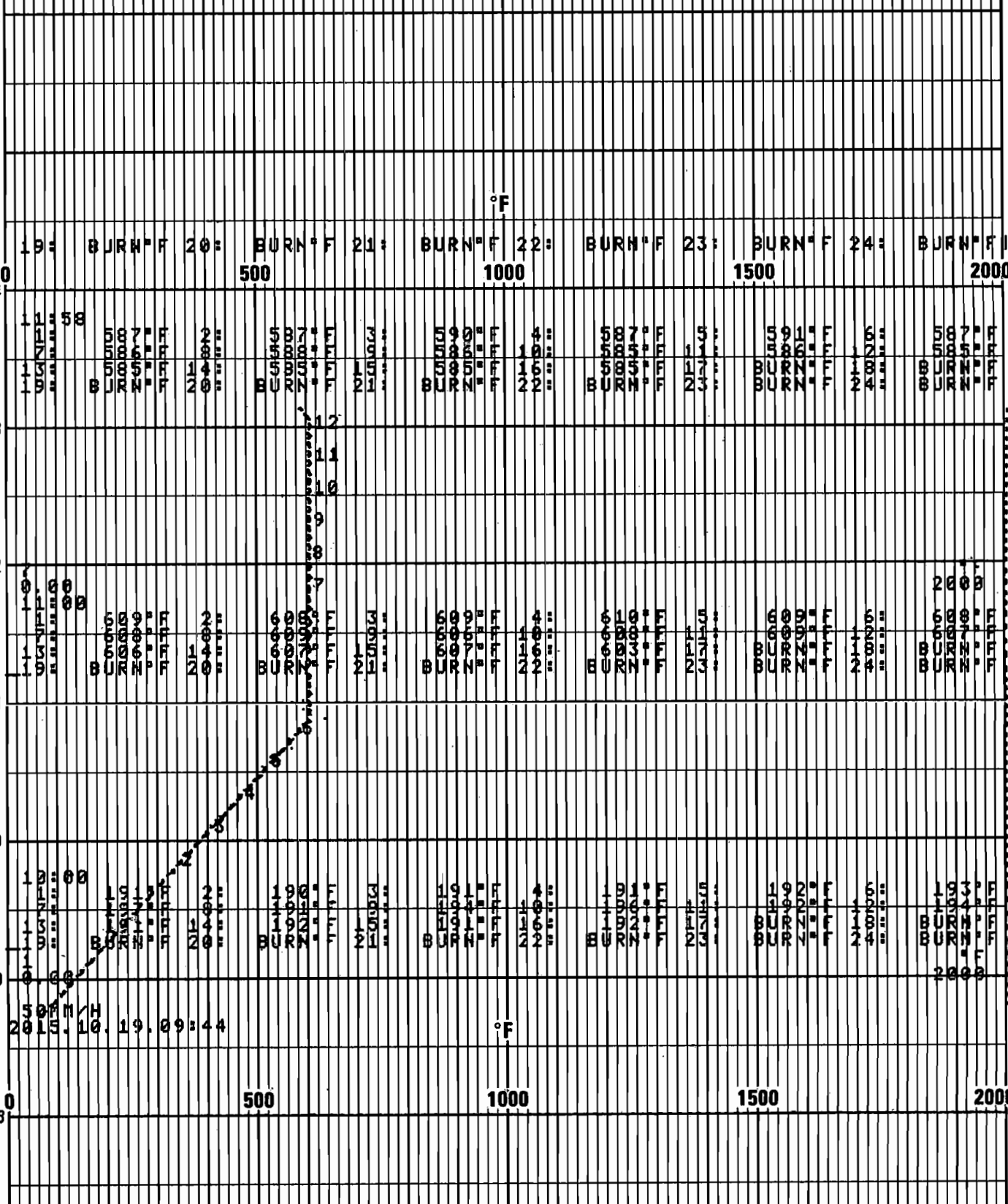
R&R Stress Relieving Service Ltd. certifies that the above listed instrument meets or exceeds all specification as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to the NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration complies with NIL-STD-45662A and ANSI/NCSL Z540.3-2006.



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Steve Pierson





 <b>R&amp;R Stress Relieving Service Ltd</b>		<b>Technician: FLORENCIO VENTURA</b> Signature: <i>[Signature]</i>		<b>Customer: EXACT</b>			
<b>Date: 10 Oct. 2015</b>		<b>Job No. RR 441</b>		<b>Site: EXACT, SLAVE LAKE, AR</b>			
<b>Recorder No. IR-188</b>		<b>Chart Speed: 50 mm/hr</b>		<b>Chart # 01 Set# 01</b>			
Weld#	Weld Dia.	TC#	Weld Description	Weld#	Weld Dia.	TC#	Weld Description
A	24"	1-4	BAKE OUT				
B	24"	5-8					
TUBE # NC 129-01							
C	24"	9-12	BAKE OUT	WHERE:			
D	24"	13-16					
TUBE # NC 129-02							
NATCO COLT CNRL CENTRAL CLEANING PLANT LSD: 12-9-81-23 W4							



# Stress Relieving Service Ltd.

DAILY TIME TICKET

# 21159

CERTIFICATE OF HEAT TREATMENT

Specifications to be agreed and signed for on behalf of client prior to commencing heat treatment

DATE: 19 OCTOBER 2015  
 CLIENT: EXACT  
 CONTACT: LEN HAYNE  
 PHONE NUMBER: 1(780) 849-2211  
 PROJECT REF: GNRL-CENTRAL CLEANING PLANT  
 LOCATION: EXACT, SLAVE LAKE, AB  
 R & R STRESS JOB No: 441  
 CLIENT P.O. No: \_\_\_\_\_

AMBIENT TO: \_\_\_\_\_ (°F) (°C) AT MODERATE RATE  
 HEAT TO 600 (°F) (°C) AT \_\_\_\_\_ (°F) (°C) / HR. MAX  
 SOAK FOR 1 HRS. - \_\_\_\_\_ MINS ± 25 (°F) (°C)  
 COOL TO \_\_\_\_\_ (°F) (°C) AT \_\_\_\_\_ (°F) (°C) / HR  
 RECORDER NO. 1R-188 CHART SPEED 50MM/HR  
 CLIENT APPROVAL:

MU- 114 / TOTAL DAILY KM , PU- \_\_\_\_\_ / TOTAL DAILY KM \_\_\_\_\_

EMPLOYEE	HOURS ON SITE			ST	OT	STANDBY TIME			TRAVEL TIME			
	IN	OUT	TOTAL			FROM	TO	TOTAL	FROM	TO	TOTAL	
FLORENCIO VENTURA	0830	1230	4	4								
SIMEON MINA	0830	1230	4	4								N/A

CHART NO: 01 - SET 01

CHART NO: \_\_\_\_\_

WELD LINE I.D. NUMBER	WELD SIZE	SCHED	S/R NUMBER	RECORD NUMBER	TOTAL WELDS	COMMENTS	WELD LINE I.D. NUMBER	WELD SIZE	SCHED	S/R NUMBER	RECORD NUMBER	TOTAL WELDS	COMMENTS
A	24" x 1"	-	1-4	-		BAKE OUT							
B	24" x 1"	-	5-8	-		BAKE OUT							
TUBE # NC129-01													
C	24" x 1"	-	9-12	-		BAKE OUT							
D	24" x 1"	-	13-16	-		BAKE OUT							
TUBE # NC129-02							WHERE: X F T.C. LOCATIONS						
NATCO COLT													
GNRL CENTRAL CLEANING PLANT													
LSD 12-9-81-23W4													

Comments: USED 1 1/2 BOX OF INSULATION. STAYED IN THE HOTEL.

11748

WORK & CHART Accepted by

Overtime Authorized by

Clients Representative (Signature)

\_\_\_\_\_  
Clients Representative (Signature)

BRANCH OFFICES:  
 Calgary (403) 236-8986  
 Blackfalds (403) 885-2280  
 Fort McMurray (780) 743-0079

TELEPHONE:  
 HEAD OFFICE:  
 (780) 955-7559  
 1-800-499-HEAT

MAILING ADDRESS:  
 2103 - 6 Street  
 Nisku, AB T9E 7X8



R&R Stress Relieving Service Ltd.  
2103 - 6th Street  
Nisku AB T9E 7X8

DATE: 26 OCTOBER 2015

CHART / JOB NO: 02/

CLIENT: EXACT

LOCATION: EXACT, SLAVE LAKE, AB

PROJECT: CNRY CENTRAL CLEANING PLANT  
LSD, 12-0-81-22W4

# EXACT OILFIELD DEVELOPING LIMITED

## Quality System Manual

### Heat Treatment Instructions

Client:	CNRL Central Cleaning Plant 12-9-81-22 W4	Date:	Oct. 26 / 2015
Reference	Natco Colt A# 210398	Job No:	
Materials:			
Code:	ASME VIII Div. 1		

### Component Description

Tube No.	Outside Diameter	Wall Thickness	Material	Length	Weight
NC129-02	24" ( 2 welds )	.500	SA106 B		

### Type of Heat Treatment



**Instructions:**

1. Temperature is to be raised from **800F(426C)** to **1150F(620C)** at a maximum rate of **400F(200C)** per hour. The rate must not exceed **400F(222C)** per hour. (Calculated rate of 400F/H divided by the governing thickness.
2. Final temperature of **1150F(620C)** (plus/minus **25F(14C)** ) to be held for **60** minutes.
3. The temperature shall be lowered from the final temperature to **800F(425C)** at a rate of **500F(278C)** per hour. This rate must not exceed **500F(278C)** per hour.

**Note:** The temperature values shown are guidelines only and the Client may have specific requirements.

**Additional Requirements:**

1. The job number and description are to be shown on the chart.
2. Calibration reports for the furnace thermocouples shall be provided as part of "the end of job package".
3. Sufficient thermocouples will be provided to control and maintain a uniform temperature at all times.
4. No welding to be performed on the component(s) after the stress relieving is complete.

Operator Signature	Signature 	Print FLORENCIO VENTURA	Date	10/26/15
Machine Number	MU-114			
QCI/QCM Signature	Signature 	Print Len Hayne	Date	10/26/15



# R&R Stress Relieving Service Ltd.

2103 – 6<sup>th</sup> Street, Nisku AB T9E 7X8

780-955-7559 \* [www.rrstress.com](http://www.rrstress.com)

## CERTIFICATE OF CALIBRATION AND CONFORMANCE

CERTIFIED BY:	R&R Stress Relieving Service
TEST NUMBER:	RR064B
DATE:	September 1, 2015
DATE DUE:	December 1, 2015
MANUFACTURER:	Chino
MODEL NO.	AH-3745 N00
SERIAL NO.	AH-082Q163
RECORDER NUMBER	IR-188

**This instrument has been calibrated and is within the manufacturers specifications.**

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### REFERENCE STANDARDS

**DIGIMITE 311600; SERIAL NO. 48430-5522; CERTIFICATION DATE: December 11, 2014**

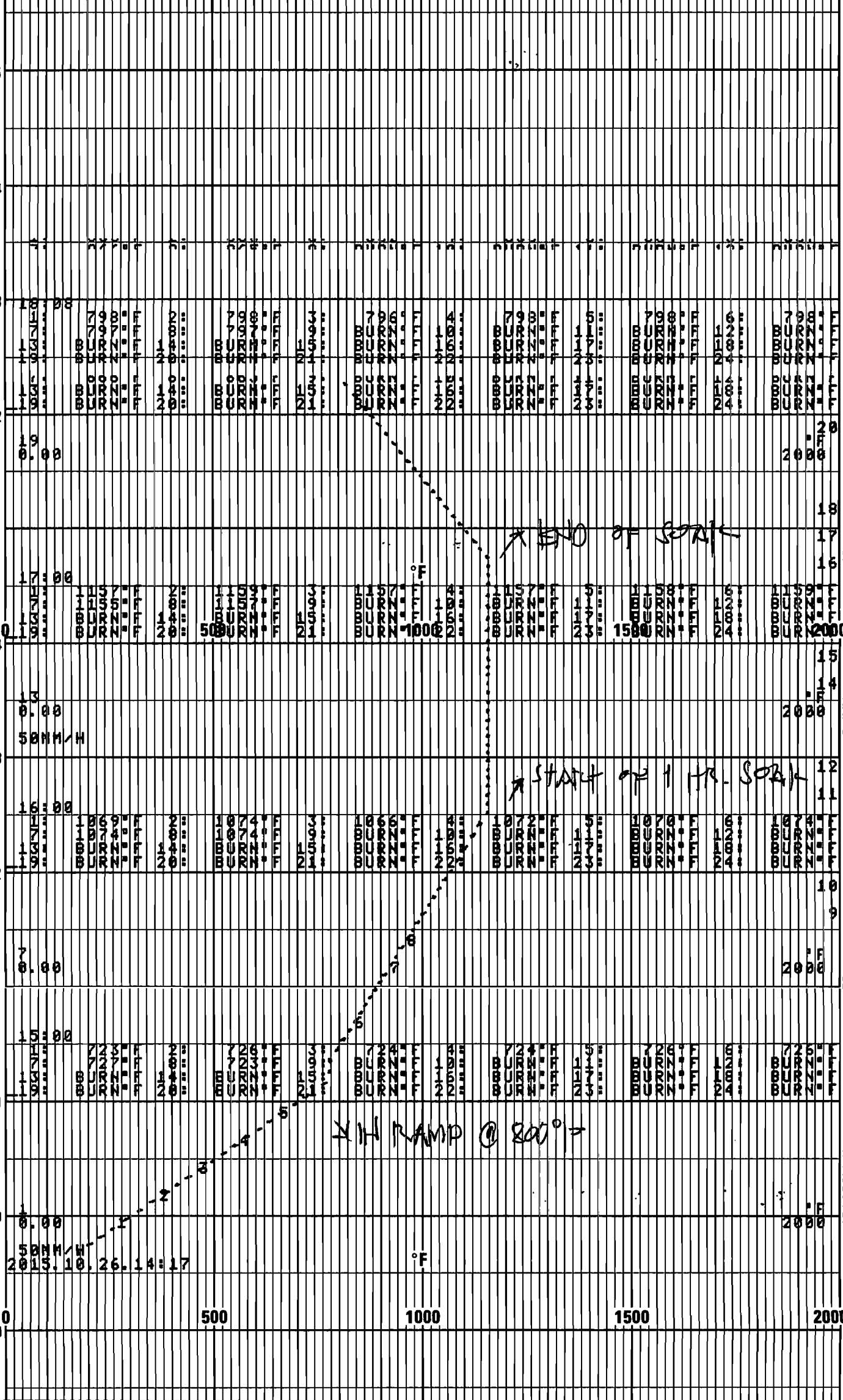
**GORDON 5060 CALIBRATOR; SERIAL NO. 028-8427113; CERTIFICATION DATE: December 11, 2014**

R&R Stress Relieving Service Ltd. certifies that the above listed instrument meets or exceeds all specification as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to the NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration complies with NIL-STD-45662A and ANSI/NCSL Z540.3-2006.

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Steve Pierson



		Technician: <u>FLORENCIO VENTURA</u> Signature: _____		Customer: <u>EXACT</u>			
Date: <u>26 OCT. 2015</u>		Job No. <u>441 KER</u>		Site: <u>EXACT, SLAVE LAKE, AB</u>			
Recorder No. <u>1R-188</u>		Chart Speed: <u>50 mm/hr</u>		Chart # <u>02</u> Set# <u>SET 02</u>			
Weld#	Weld Dia.	TC#	Weld Description	Weld#	Weld Dia.	TC#	Weld Description
X1	24"	1-4	BK				
X2	24"	5-8	BK				
TUBE # NC129-02 REF # NATCO COLT A#210308 CHIN CENTRAL CLEANING PLANT LSD: 12-9-81-22W4							
WHERE: X = T.C. LOCATIONS							



# Stress Relieving Service Ltd.

DAILY TIME TICKET  
# 21168

CERTIFICATE OF HEAT TREATMENT

Specifications to be agreed and signed for on behalf of client prior to commencing heat treatment

DATE: 26-27 OCTOBER 2015  
 CLIENT: EXACT  
 CONTACT: LEN HAYNE  
 PHONE NUMBER: 1(780)849 2211  
 PROJECT REF: CNNL CENTRAL CLEANING PLANT  
 LOCATION: EXACT, SLAVE LAKE, AB  
 R & R STRESS JOB No: 449  
 CLIENT P.O. No: \_\_\_\_\_

AMBIENT TO: 800 (°F) (°C) AT MODERATE RATE  
 HEAT TO 1150 (°F) (°C) AT 400 (°F) (°C) / HR. MAX  
 SOAK FOR 1 HRS. - 25 MINS ± (°F) (°C)  
 COOL TO 800 (°F) (°C) AT 500 (°F) (°C) / HR  
 RECORDER NO. RR-188 CHART SPEED 50MM/HR  
 CLIENT APPROVAL: [Signature]

MU- 114 / TOTAL DAILY KM 280 , PU- - / TOTAL DAILY KM -

EMPLOYEE	HOURS ON SITE			ST	OT	STANDBY TIME			TRAVEL TIME			
	IN	OUT	TOTAL			FROM	TO	TOTAL	FROM	TO	TOTAL	
FLORENCIO VENTURA	1430	1930	5	2	3			/				
SIMEON MINA	1430	1930	5	2	3			N/A				06000930 3 1/2

CHART NO: O2 - SET 2

CHART NO: -

WELD LINE I.D. NUMBER	WELD SIZE	SCHED	S/R NUMBER	RECORD NUMBER	TOTAL WELDS	COMMENTS	WELD LINE I.D. NUMBER	WELD SIZE	SCHED	S/R NUMBER	RECORD NUMBER	TOTAL WELDS	COMMENTS
X1	24" K1"	1	1-4	1	1	BW							
X2	24" K1"	2	5-8	1	1	BW							
TUBE # <u>NC129-02</u>													
REF # <u>NATCO COLT A# 210398</u>													
CNR <u>CENTRAL CLEANING PLANT</u>													
LSD <u>12-9-81-22W4</u>													
WHERE!													
X = T.C. LOCATIONS													

Comments: USED 3/4 BOX OF INSULATION.

WORK & CHART Accepted by

[Signature]  
Clients Representative (Signature)

Overtime Authorized by

[Signature]  
Clients Representative (Signature)

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