

Issuing Authority: Marvin J. (Ty) DeBelser		Quality Control
Date of Issue: March 13, 2008		QCFO Final Inspection Release Certificate R00

FINAL INSPECTION RELEASE CERTIFICATE

CUSTOMER:	MURPHY OIL COMPANY	SALES ORDER#: N/A
PRODUCT:	COIL, 3" 2500 RTJ x 3" 600 RF for 1MM BTU 42" X 16' LINEHEATER, MURPHY SPEC	WO#: 08118-003
		DATE: Nov. 26, 2011

FINAL INSPECTION DOCUMENTATION

REVIEWED BY:	ACCEPTED:	REJECTED:
STANDARD DOCUMENTATION REQUIREMENTS: (SEE DOCUMENT REQUIREMENT LIST)		
ADDITIONAL DOCUMENT REQUIREMENTS: (TO BE RECORDED HERE IF APPLICABLE I.E. DOCUMENT PACKAGE REQUIRED BY CUSTOMER ETC.)		

Q.C. FILE CLOSURE BY: <i>Kasha Fox</i>	DATE: Nov 28 2011
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LOOSE COMPONENTS REQUIRED / PREPARED

ITEMS REQUIRED:	NO. OF BOXES OR PKGS. _____
Coil, for a 1mm BTU Lineheater	
ADDITIONAL HARDWARE OR FASTENERS REQUIRED	YES ☒ NO ☐

PREPARATION FOR SHIPMENT / STORAGE

PREPARATION NEEDED / COMPLETED

S/N #	NWP-08118-003
PART #	Replacement Coil

INVENTORY TAGS ATTACHED	YES ☒ NO ☐
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SHIPPING INSTRUCTIONS

CUSTOMER P.O. REVIEWED	YES ☐ N/A ☒
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CONTACT PERSON AUTHORIZED TO RELEASE PRODUCT:	_____
PHONE:	FAX:

RELEASED TO INVENTORY:	DATE:
RELEASED TO CUSTOMER: <i>[Signature]</i>	DATE: Nov. 26, 2011

NWP Industries Inc.

12
AUG 04 2011

INDIRECT FIRED HEATER COIL EXAMINATION AND INSPECTION REPORT

DO NOT START CONSTRUCTION WITHOUT AI REVIEW					EXAMINATION AND INSPECTION REPORT				
REVISION NO.: 012									
AI REVIEW: <i>[Signature]</i>			REVIEW DATE: AUG 05 2011						
SERIAL NO. NWP-08118-003 JOB NO.: 08118-003			COIL TYPE: 3" 2500 RTS x 3" 600 RF						
DRAWING NO.: 08118 DWG. REVISION NO.: 01			EXAMINATION AND INSPECTION REPORT						
INITIATION BY: <i>[Signature]</i>									
Seq.	Item	Comments	Q.C.I.	Date	A.I. Hold Points	A.I.	Date	Owner	Date
1.	Calculations in File		<i>RMP/R</i>	AUG 03/11	*	<i>[Signature]</i>	AUG 05 2011		
2.	Release of App'd Dwg.		<i>RMP/R</i>	AUG 03/11	*	<i>[Signature]</i>	AUG 05 2011		
3.	Heat Numbers Recorded		<i>RMP/R</i>	NOV 31/11	*	<i>[Signature]</i>	11-25-11		
4.	MTRs Checked		<i>RMP/R</i>	NOV 31/11	*	<i>[Signature]</i>	11-25-11		
5.	Materials Checked Against Drawings and Specs	HOLD	<i>RMP/R</i>	NOV 10/11					
6.	W.P.S. Checked		<i>RMP/R</i>	NOV 10/11					
7.	Welders Qualified	HOLD	<i>RMP/R</i>	NOV 10/11					
8.	Thicknesses Recorded		<i>RMP/R</i>	NOV 22/11					
9.	Fit-up Examination(s)		<i>RMP/R</i>	NOV 21/11					
10.	Impact Tests	NA							
11.	Welds Examined		<i>RMP/R</i>	NOV 21/11	*	<i>[Signature]</i>	11-25-11		
12.	Welder I.D. Checked		<i>RMP/R</i>	NOV 21/11	*	<i>[Signature]</i>	11-25-11		
13.	Final External Inspection		<i>RMP/R</i>	NOV 21/11	*	<i>[Signature]</i>	11-25-11		
14.	Radiography	HOLD	<i>RMP/R</i>	NOV 21/11	*	<i>[Signature]</i>	11-25-11		
15.	Other N.D.E.	HOLD N/A							
16.	Final Ext. Prior to P.W.H.T.	HOLD	<i>RMP/R</i>	NOV 24/11	*				
17.	PWHT Chart Checked	HOLD	<i>RMP/R</i>	NOV 24/11	*	<i>[Signature]</i>	11-25-11		
18.	Hydrostatic Test	Coil No. 1 Gauge # <i>HOLD</i> Coil No. 2 Gauge #	<i>RMP/R</i>	NOV 25/11	**	<i>[Signature]</i>	11-25-11		
19.	CRN Drawing	CRN# P9407.213 P9403.213	<i>RMP/R</i>	AUG 03/11	*	<i>[Signature]</i>	AUG 05 2011		
20.	N.C.R. #								
21.	Nameplate Stamping		<i>RMP/R</i>	NOV 22/11	* *	<i>[Signature]</i>	11-25-11		
22.	Data Report (AB-28) completed		<i>RMP/R</i>	NOV 25/11	**	<i>[Signature]</i>	11-25-11		
23.	Nameplate Installation								

The Authorized Inspector shall be presented with the Examination and Inspection Report prior to construction so that he can designate additional inspection points and/or Hold Points. Any revisions shall be marked with a delta symbol with revision number and described at the bottom of this page.

* Denotes an A.I. Inspection Point ** Denotes an A.I. Hold Point



the pressure equipment safety authority

MANUFACTURER'S DATA REPORT FOR INDIRECT FIRED HEATER COILS

AB-28 2006-02

PARTIAL ☐

A# 605345

Manufactured By: NWP Industries Inc. 4017 60th Ave, Innisfail AB, T4G-1S9

Manufactured For: Murphy Oil Corporation, Ltd. 1700-555-4th Avenue S.W. Calgary, Alberta T2P 3E7

Ultimate Owner: Murphy Oil Corporation, Ltd. 1700-555-4th Avenue S.W. Calgary, Alberta T2P 3E7

Location of Installation: Murphy Oil Corporation, Ltd. 1700-555-4th Avenue S.W. Calgary, Alberta T2P 3E7

Manufacturer's Serial No.	Construction Drawing No.	CODE: ASME B31.3		Year Built
NWP-08118-003	08118 Rev 1	Edition	2008 Addenda	2011

CONSTRUCTION

	Coil ID/Purpose	Design Pressure	Design Temp	Design Minimum Temp	Corrosion Allowance	Registered Drawing No.	CRN
a	PREHEAT COIL A	5031 PSIG	200F	-20F	1/8"	BDD-300A REV 2	P9403.213
b	PREHEAT COIL B	1350 PSIG	200 F	-20F	1/8"	BDD-300 REV 10	P9407.213
c	PREHEAT COIL C	1350 PSIG	200F	-20F	1/8"	BDD-300 REV 10	P9407.213
d	PREHEAT COIL D	5031 PSIG	200F	-20F	1/8"	BDD-300A REV 2	P9403.213
e							

COIL

	Tubes			End Closures				Openings		
	Mat'l Spec.	Diameter	Thickness	Return Bend Mat'l Spec.	Thickness	Flanges Mat'l Spec.	Rating	Mat'l Spec.	Size/Type	Rating
a	SA-333-6	3" NPS	SCH XXH	SA-420-WPL6	SCH XXH	SA-350-LF2 CL 1	CL 2500	NA	NA	NA
b	SA-333-6	3" NPS	SCH 80	SA-420-WPL6	SCH XH/80	SA350-LF2-CL1	CL 600	NA	NA	NA
c	SA-333-6	3" NPS	SCH 80	SA-420-WPL6	SCH XH/80	SA-350-LF2 CL 1	CL 600	NA	NA	NA
d	SA-333-6	3" NPS	SCH XXH	SA-420-WPL6	SCH XXH	SA-350-LF2 CL 1	CL 2500	NA	NA	NA
e										

HEADERS/MANIFOLDS

	Purpose	Size	Shell	Thickness	Ends		Openings			
			Mat'l Spec.		Mat'l Spec.	Thickness	No	Mat'l Spec	Size/Type	Rating
i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
g	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TEST PRESSURE, NDE, POSTWELD HEAT TREATMENT AND SIZE

	Hydrostatic Test Pressure	Radiography (100% or % Random)	Other NDE (MT) (PT) (UT)	Postweld Heat Treatment		Overall Length	Heating Surface	Volume
				Temp.	Time			
a	7547 PSIG	100%		1160F	1 hour	196 3/8"	83.8 sq.ft.	2.64 cu.ft
b	2025 PSIG	100%		1160F	1 hour	210 1/8"	31.9 sq.ft.	1.59 cu.ft.
c	2025 PSIG	100%		1160F	1 hour	210 1/8"	31.9 sq.ft.	1.59 cu.ft.
d	7547 PSIG	100%		1160F	1 Hour	196 3/8"	83.8 sq.ft.	2.64 cu.ft
e								
f								
g								

IMPACT TESTING: Exempt per table 323.2.2 column A

REMARKS: JO# 08118

CERTIFICATE OF COMPLIANCE

We certify that the statements in this report are correct and that all details of design, material, construction, and workmanship of this coil bundle are in accordance with the above Provincial Registered Design.

Date Nov 25/11

Signed R.M. Spence:

(Representative)

For NWP Industries Inc.

(Manufacturer)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, a duly authorized Safety Codes Officer employed by ABSA has inspected the above Heater Coils and state that, to the best of my knowledge and belief, the construction is in accordance with the Alberta Safety Codes Act and Regulations.

Date Nov 25/11

Signed Joe Tworek

NA 11995 AB

AB 261

W
RT 100%
HT

CERTIFIED BY



MADE IN CANADA

SERIAL NO. NWP- 08118-003

COIL A 3" CL 2500 PREHEAT

MAWP 5031 PSI AT 200 °F

MDMT -20 °F AT 5031 PSI

CRN P 9403.213 YEAR BUILT 2011

COIL B 3" CL 600 REHEAT

MAWP 1350 PSI AT 200 °F

MDMT -20 °F AT 1350 PSI

CRN P 9407.213

COIL C 3" CL 600 REHEAT

MAWP 1350 PSI AT 200 °F

MDMT -20 °F AT 1350 PSI

CRN P 9407.213

COIL D 3" CL 2500 PREHEAT

MAWP 5031 PSI AT 200 °F

MDMT -20 °F AT 5031 PSI

CRN P 9403.213



HYDROSTATIC TEST AFFIDAVIT

CUSTOMER:	MURPHY OIL CORP	W.O. #	08118-003
PROJECT:	3" REPLACEMENT COIL	PROJECT #	
TEST PRESSURE:	7547 PSI & 2025 PSI	HOLD TIME:	1 HR
CODE REQUIREMENTS:	ASME B31.3 NPS 2010 EDITION	DATE:	NOV 25/11
ALL PERSONNEL ADVISED OF TEST	☒		
ALL SIGNS & FLAGGING POSTED	☒		
PRIOR TO FILLING - FITTINGS / HOSES & COMPONENT MEET REQUIRED TEST PRESSURE			
SIGN-OFF	SUPERVISOR	TESTER	

PRODUCT DESCRIPTION

① PREHEAT COILS R4D = 7547 PSI

② REHEAT COILS B4C = 2025 PSI

50% TEST PRESSURE LEAK / SYSTEMS CHECK COMPLETED



① 50% = 3774 PSI *AMP*

② 50% = 1013 PSI *AMP*

EQUIPMENT DRAINED & FLUSHED TO PREVENT FREEZING

YES

☐ NO☐

START TIME:

9:00 AM

FINISH TIME:

2:50 PM

TEST GAUGE IDENT.	PRESSURE RANGE	CALIBRATION DATE
① NWPG-20000-4	0-20000 PSI	15/07/2012
NWPG-20000-5	0-20000 PSI	28/09/2012
② NWPG-5000-22	0-5000 PSI	24/08/2012
NWPG-5000-24	0-5000 PSI	21/11/2012
TEST BY: Rob Band		DATE: NOV-25/11
APPROVED BY: <i>[Signature]</i>		DATE: NOV 25/11



R & R Stress Relieving Service Ltd.

Nisku: 2103 - 6th Street, T9E 7X8 Tel: (780) 955-7559 Fax: (780) 955-2903
Blackfalds: #13 Burbank Industrial Park Tel: (403) 885-2280 Fax: (403) 885-0177
Toll Free: 1-800-499-HEAT(4328)

CERTIFICATE OF CONFORMANCE OF RECORDING INSTRUMENTS

CERTIFIED BY:	<u>R & R Stress Relieving Service Ltd.</u>
TEST NUMBER:	<u>RR1011</u>
DATE:	<u>October 7, 2011</u>
DATE DUE:	<u>January 7, 2012</u>
INSTRUMENT MFG:	<u>Chino</u>
MODEL NUMBER:	<u>AH-3725 N00</u>
SERIAL NUMBER:	<u>AH-02XA233</u>
RECORDER NUMBER:	<u>IR-164</u>

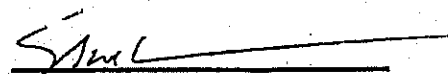
This instrument has been calibrated and it is within the manufacturers specifications.

REFERENCE STANDARDS

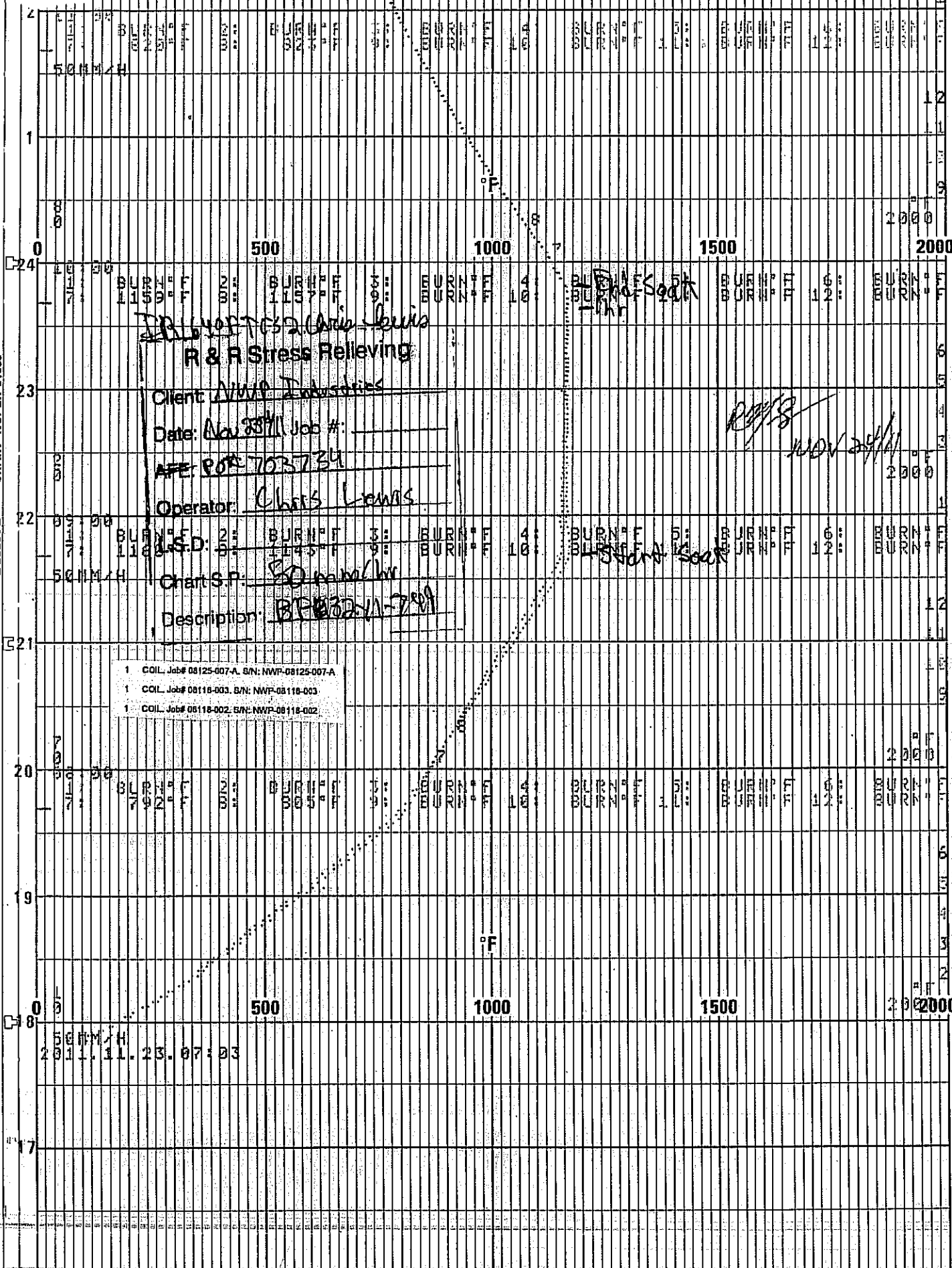
DIGI MITE 311600 S/N48430-5522

CERT DATE Nov 1/10

The calibration of all standards and measuring instruments used in the calibration are traceable to the National Research Council of Canada in Ottawa or to the National Bureau of Standards in Washington, D.C.


Shane Stimson

OIL AND GAS ★ PETROCHEMICAL ★ POWER ★ PULP AND PAPER
INNOVATION ★ QUALITY ★ EXPERIENCE



220cm

30cm

240cm



HEAT TREATMENT REQUIREMENTS

Serial # NWP-08118-002

PO# 703734

JOB NO.: 08118-002

CUSTOMER: Murphy Oil

DATE: November 23 2011

COMPONENT DESCRIPTION:

48" OD X16' LG Lineheater Replacement Coil

DWG. NO. AND LINE NO.	DIAMETER	THICKNESS	MATERIAL	LENGTH	WEIGHT
08118 Rev 0	3"NPS	SCH 80	SA-333-GR6	187 3/8"	Unknown
	3" NPS	XXH	SA-333-6	178 3/8"	Unknown

TYPE OF HEAT TREATMENT:

PRESSURE VESSEL or Process Piping STRESS RELIEVE P1 and Materials

HEATING

Temperature to be raised from 800°F (427°C) to 1150°F (594°C) at a maximum rate of 400 °F

(_____ °C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 400°F (222°C) PER HOUR.

[Calculated rate = 400 degrees F/hr. (222 degrees C/hr) Divided by the maximum metal thickness of the shell or head plate in inches]

HOLDING

Temperature to be held in range of 1150F to 1175F for 60 minutes.

[Holding time to be determined by Table UCS-56 for Nominal Thickness as specified in UW-40(f)]

COOLING

Temperature to be lowered from 1150°F (594°C) to 800°F (427°C) at a maximum rate of 500 °F

(_____ °C) per hour. NOTE: THIS VALUE MUST NEVER EXCEED 400°F (278°C) PER HOUR.

[Calculated rate = 400 degrees F/hr. (278 degrees C/hr.) Divided by the maximum metal thickness of the shell or head plate in inches]

From 800°F (427°C) HOLD EQUIPMENT IN OVEN UNTIL TEMPERATURE REACHES 300F

Additional Requirements:

- ☐ Job number and description required on heat treatment charts along with the operator's signature & date.
- ☐ Reporting of thermocouple attachment method and location, and verification of furnace thermocouple calibration is required.
- ☐ A sufficient number of thermocouples shall be located to control and maintain uniform distribution of temperature on all vessels and parts. Thermocouples shall be directly attached to the item or provision shall be made for thermocouple placement at bottom, centre and top of the furnace charge in accordance with the ASME Code.
- ☐ During the heating period, there shall not be a greater variation in temperature throughout the portion of the vessel being heated than 250° F (139° C) within any 15 ft. (4.6 m) interval of length. An adequate number of thermocouples must be used to ensure this Code requirement is met.
- ☐ During the holding period, there shall not be a greater difference than 150° F (83° C) between the highest and lowest temperature throughout the portion of the vessel being heat treated, except where the range is further limited by these instructions.
- ☐ If Capacitor Discharge welding is used to attach thermocouples an ASME Code Section IX Welding Procedure Specification is required (WPS qualification is not required), and the energy output must be limited to 125 Watt-Seconds.
- ☐ No other welding is permitted on vessels or parts. [0.5 x Capacitance in farads X Voltage ² = W-Sec.]
- ☐ The method of thermocouple removal shall not damage the heat treated item.

Q.C. Inspector Signature

R.M. Spive

Date: NOV 24/11

Thermocouple Attachment Method:

capacitor discharge

Location (s) ends

Furnace Heat Number RF32-11-749

Furnace Operator Signature

*Chris Lewis*Date: Nov 23rd/11

Form Prepared by: Kasha Fox

Date: November 16 2011



N.D.E. REQUIREMENTS

CLIENT:

MURPHY OIL CORP

PROJECT:

3" REPLACEMENT COIL

W.O. # 08118-003

PIPING: ☒

PRESSURE VESSEL:

DATE: NOV 14/11

X-RAY

☒ GAMMA RAY

ULTRASONICS

LIQUID PENETRANT

MAGNETIC PARTICLE

ACOUSTIC EMISSION

Hardness test Max 200 BHN

☒ 100%

FULL

25%

10%

OTHER (DEFINE)

SPOT

TANK:

OTHER:

ASME SECTION VIII-UW-51

ASME SECTION VIII-UW-52

ASME B31.1

☒ ASME B31.3 NFS

OTHER (SPECIFY)

Customer Spec

CSA W47.1/W59

GENERAL INSTRUCTIONS:

COIL
Vessel s/n

Sales Order #

NWVP-08118-003

P1 Material

Welder ID

B

Shell -T=

Pipe -T=

3" XXH 4 3" XXH

Total Welds

START SHOOTING PKG (FIRST #15 X-1)

Please use wire type IQ-1

Please note all indications on films on reports

Please include O.F.D - S.O.D S.F.D on Reports

X1-X4 - 3" XXH

X5-X15 3" XXH

15 SHOTS

SPECIAL REQUIREMENTS:

PO#

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, piping, etc

Flashes must contain

MURPHY

Xray number, Clock tape, Welder's ID symbol, Date

NOTE: Encana spec for welded piping- acceptance is zero UC and zero IP
Encana spec for socket welds- acceptance is minimum 1/16" gap
Encana spec for threaded piping- acceptance is 7 threads engaged

PREPARED BY:

[Signature]

DATE: NOV 14/11

Exposure Device #: D5971	Source #: 75734B	Job / P.O. #: 08118-003	IRISNDT #: 3491	Date: 14-Nov-11
Cobalt 60 ☐ IR 192 ☒ X-Ray ☐	EFSS: .152"	Client: MURPHY OIL C/O NWP		
Film Brand: AGFA	#Film/cassette: 1	Location: INNISFAIL, ALBERTA		
Code: ASME B31.3 NORMAL		Item Inspected: REPLACEMENT COIL - 3" OD Material: P1		

Film #	Size, Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A) ccept (R) eject
									WO# 08118-003 SN# NWP-08118-003	
X1	3"XH	B	RT 3	3.08	.425	3	1	D4	P@11	A
X2	3"XH	B	RT 3	3.08	.425	3	1	D4	P@10.75	A
X3	3"XH	B	RT 3	3.08	.425	3	1	D4	IC@0.5, P@6.25	A
X4	3"XH	B	RT 3	3.08	.425	3	1	D4	IP@4	A
X5	3"XXH	B	RT 3A	2.78	.725	4	1	D4		A
X6	3"XXH	B	RT 3A	2.78	.725	4	1	D4		A
X7	3"XXH	B	RT 3A	2.78	.725	4	1	D4	P@2	A
X8	3"XXH	B	RT 3A	2.78	.725	4	1	D4		A
X9	3"XXH	B	RT 3A	2.78	.725	4	1	D4		A
X10	3"XXH	B	RT 3A	2.78	.725	4	1	D4	P@6.5-6.75	A
X11	3"XXH	B	RT 3A	2.78	.725	4	1	D4	IC@5	A
X12	3"XXH	B	RT 3A	2.78	.725	4	1	D4	P@.75, IC@1	A
X13	3"XXH	B	RT 3A	2.78	.725	4	1	D4	IC@12	A
X14	3"XXH	B	RT 3A	2.78	.725	4	1	D4	LC@1.75	A
X15	3"XXH	B	RT 3A	2.78	.725	4	1	D4	IC@4.5, P@6.75	A

Number of Radiation Barrier Warning Signs Erected:

Number of Radiation Barrier Warning Signs Returned:

Work Location Legend: [1] Inside Fab. Shop [2] Yard/Lay-down Area [3] Piping/Modular Fab. Area [4] N/A (Other)

IRIS Procedure: Single Wall Exposure: RT 1, 2, 2A, 6, 7 Double Wall Exposure RT 3, 3A, 4, 5, 6	S.O.D. = Source-to-object distance (D) O.F.D. = Source-object-distance (D In T-274.1)	AB - Arc Burns BT - Burn Through CK - Crack EP - Excessive Penetration P - Porosity	EUC - External Undercut IUC - Internal Undercut HB - Hollow Bead IP - Incomplete Penetration S - Slag	IC - Internal Concavity LF - Lack of Fusion LC - Low Cover MA - Misalignment
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Unit#: 198 Kilometers: 30
In: Out: Hrs: 3.5
In: Out: Hrs:
Personnel:
JEFF BAJEMA, STEVE WHITE

Film Quantity:		
56	(2 3/4 x 5 1/2)	D4

Interpretation by:
JEFF BAJEMA SNT-TC-1A II
(Print) C.G.S.B. II (Level)
C.G.S.B. # 10863
(Signature)
Client Representative: (Print)
I am in full agreement with report contents (Sign)



N.D.E. REQUIREMENTS

CLIENT: <u>MURPHY OIL CORP</u>		W.O. # <u>08118-003</u>
PROJECT: <u>3" REPLACEMENT COIL</u>		DATE: <u>NOV 15/11</u>
PIPING: ☒	PRESSURE VESSEL:	TANK: OTHER:
☒ X-RAY	☒ 100%	ASME SECTION VIII-UW-51
☒ GAMMA RAY	☐ FULL	ASME SECTION VIII-UW-52
☐ ULTRASONICS	☐ 25%	ASME B31.1
☐ LIQUID PENETRANT	☐ 10%	☒ ASME B31.3 NFS
☐ MAGNETIC PARTICLE	☐ OTHER (DEFINE)	OTHER (SPECIFY)
☐ ACCOUSTIC EMISSION	☐ SPOT	Customer Spec
☐ Hardness test Max 200 BHN		CSA W47.1/W59

GENERAL INSTRUCTIONS: COIL
Vessel s/n NWP-08118-003-
Sales Order # _____

P1 Material _____

Welder ID X, H, B

Shell -T= _____

Pipe -T= 3"XXH

Total Welds CONTINUE SHOOTING PKG (FIRST #15 X-16)

Please use wire type iQi Nb

Please note all indications on films on reports

Please include O.F.D - S.O.D S.F.D on Reports

13 SHOTS

SPECIAL REQUIREMENTS: PO# _____

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded shots to be identified as XT-#

Identify on Envelope part of package being shot ie. Coil, piping, etc

Flashes must contain: MURPHY, Xray number, Clock tape, Welder's ID symbol, Date

NOTE: Encana spec for welded piping- acceptance is zero UC and zero IP
Encana spec for socket welds- acceptance is minimum 1/16" gap
Encana spec for threaded piping- acceptance is 7 threads engaged

PREPARED BY: <u>Ref. Spence</u>	DATE: <u>NOV 16/11</u>
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NDEREQ REV 2

Exposure Device #: D5971

Source #: 75734B

Job / P.O. #: 08118-003

IRISNDT #: 3497

Date: 16-Nov-11

Cobalt 60 ☐ IR 192 ☒ X-Ray ☐

EFSS: .152"

Client: MURPHY OIL C/O NWP

Film Brand: AGFA

#Film/cassette: 1

Location: INNISFAIL, ALBERTA

Code: ASME B31.3 NORMAL

Item Inspected: REPLACEMENT COIL - 3" OD

Material: P1

Film #	Size, Location, Thickness	Welder ID	IRISNDT Proc.	S.O.D. Inches	O.F.D. Inches	# of Exp.	Work Loc.	Film Type	Type and Location of Discontinuities (rejectable discontinuities in square brackets [])	(A) ccept (R) eject
									WO# 08118-003- SN# NWP-08118-003	
X16	3"XH	H	RT 3	3.08	.425	3	1	D4	IC@3, 6, 7.25	A
X17	3"XH	H	RT 3	3.08	.425	3	1	D4		A
X18	3"XH	H	RT 3	3.08	.425	3	1	D4		A
X19	3"XH	H	RT 3	3.08	.425	3	1	D4		A
X20	3"XXH	H	RT 3A	2.78	.725	4	1	D4	IC@10	A
X21	3"XXH	H	RT 3A	2.78	.725	4	1	D4		A
X22	3"XXH	H	RT 3A	2.78	.725	4	1	D4		A
X23	3"XXH	B	RT 3A	2.78	.725	4	1	D4	IC@4.5, P@10	A
X24	3"XXH	X	RT 3A	2.78	.725	4	1	D4		A
X25	3"XXH	H	RT 3A	2.78	.725	4	1	D4	IC@1.25	A
X26	3"XXH	X	RT 3A	2.78	.725	4	1	D4	S@7.5	A
X27	3"XXH	XH	RT 3A	2.78	.725	4	1	D4	P@8.5	A
X28	3"XXH	X	RT 3A	2.78	.725	4	1	D4	S@10.5	A

Number of Radiation Barrier Warning Signs Erected:

Number of Radiation Barrier Warning Signs Returned:

Work Location Legend:

[1] Inside Fab. Shop

[2] Yard/Lay-down Area

[3] Piping/Modular Fab. Area

[4] N/A (Other)

IRIS Procedure:

Single Wall Exposure:

RT 1, 2, 2A, 6, 7

Double Wall Exposure:

RT 3, 3A, 4, 5, 8

S.O.D. =

Source-to-object distance (D)

O.F.D. =

Source-object distance (D in T-274.1)

AB - Arc Burns

BT - Burn Through

CK - Crack

EP - Excessive Penetration

P - Porosity

EUC - External Undercut

IUC - Internal Undercut

HB - Hollow Bead

IP - Incomplete Penetration

S - Slag

IC - Internal Concavity

LF - Lack of Fusion

LC - Low Cover

MA - Misalignment

Unit#: 198

Kilometers: 15

In: _____ Out: _____ Hrs: 3.0

In: _____ Out: _____ Hrs: _____

Personnel:

JEFF BAJEMA, STEVE WHITE

Film Quantity:

48 (2 3/4 x 5 1/2) D4

Interpretation by:

JEFF BAJEMA

(Print)

(Signature)

Client Representative:

I am in full agreement with report contents

(Sign)

SNT-TC-1A

C.G.S.B.

C.G.S.B. #

II

II

(Level)

10863



N.D.E. REQUIREMENTS

CLIENT: <u>MURPHY OIL CORP</u>		W.O. # <u>08118-003</u>
PROJECT: <u>3" REPLACEMENT COIL</u>		DATE: <u>NOV 18/11</u>
PIPING: ☒	PRESSURE VESSEL:	TANK: ☐ OTHER: ☐
☒ X-RAY	☒ 100%	ASME SECTION VIII-UW-51
☒ GAMMA RAY	☐ FULL	ASME SECTION VIII-UW-52
☐ ULTRASONICS	☐ 25%	ASME B31.1
☐ LIQUID PENETRANT	☐ 10%	☒ ASME B31.3 NFS
☐ MAGNETIC PARTICLE	☐ OTHER (DEFINE)	OTHER (SPECIFY)
☐ ACCOUSTIC EMISSION	☐ SPOT	Customer Spec
☐ Hardness test Max 200 BHN		CSA W47.1/W59

GENERAL INSTRUCTIONS: COIL
Vessel s/n NWP-08118-003
Sales Order # _____

P1 Material _____

Welder ID X, H, L

Shell -T= _____

Pipe -T= 3" X X H

Total Welds CONTINUE SHOOTING PKG (FIRST # IS X-29)

Please use wire type iQi

Please note all indications on films on reports

Please include O.F.D - S.O.D S.F.D on Reports

4 SHOTS

SPECIAL REQUIREMENTS: PO# _____

Buttweld Xray to be identified as X-#

Gap Shots to be identified as GS-#

Threaded shots to be identified as XT-#

Identify on Envelope part of package being shot (e. Coil, piping, etc)

Flashes must contain: MURPHY, Xray number, Clock tape, Welder's ID symbol, Date

NOTE: Encana spec for welded piping- acceptance is zero UC and zero IP
Encana spec for socket welds- acceptance is minimum 1/16" gap
Encana spec for threaded piping- acceptance is 7 threads engaged

PREPARED BY: <u>[Signature]</u>	DATE: <u>NOV 18/11</u>
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Job / P.O. #: 08118-003 IRISNDT #: 3497 Date: 18-Nov-11
Client: MURPHY OIL C/O NWP
Location: INNISFAIL, ALBERTA
Item Inspected: REPLACEMENT COIL - 3" OD Material: P1

CUSTOMER COPY



3" RETURN BENDS

UT#	LOW	AVG	NOM	UT#	LOW	AVG	NOM
UT-01	0.571"	0.611"	0.600"	UT-45	0.564"	0.614"	0.600"
UT-02	0.581"	0.611"	0.600"	UT-46	0.567"	0.611"	0.600"
UT-03	0.560"	0.607"	0.600"	UT-47	0.546"	0.618"	0.600"
UT-04	0.581"	0.614"	0.600"	UT-48	0.556"	0.600"	0.600"
UT-05	0.565"	0.624"	0.600"	UT-49	0.550"	0.608"	0.600"
UT-06	0.561"	0.625"	0.600"	UT-50	0.556"	0.614"	0.600"
UT-07	0.558"	0.630"	0.600"	UT-51	0.277"	0.291"	0.300"
UT-08	0.573"	0.623"	0.600"	UT-52	0.297"	0.310"	0.300"
UT-09	0.537"	0.613"	0.600"	UT-53	0.323"	0.332"	0.300"
UT-10	0.564"	0.620"	0.600"	UT-54	0.293"	0.317"	0.300"
UT-11	0.571"	0.621"	0.600"	UT-55	0.319"	0.328"	0.300"
UT-12	0.558"	0.620"	0.600"	UT-56	0.276"	0.297"	0.300"
UT-13	0.541"	0.608"	0.600"	UT-57	0.284"	0.302"	0.300"
UT-14	0.554"	0.617"	0.600"	UT-58	0.287"	0.303"	0.300"
UT-15	0.550"	0.618"	0.600"	UT-59	0.290"	0.313"	0.300"
UT-16	0.562"	0.622"	0.600"	UT-60	0.289"	0.314"	0.300"
UT-17	0.555"	0.603"	0.600"				
UT-18	0.570"	0.628"	0.600"				
UT-19	0.531"	0.594"	0.600"				
UT-20	0.550"	0.611"	0.600"				
UT-21	0.559"	0.618"	0.600"				
UT-22	0.553"	0.622"	0.600"				
UT-23	0.539"	0.605"	0.600"				
UT-24	0.568"	0.627"	0.600"				
UT-25	0.513"	0.597"	0.600"				
UT-26	0.545"	0.611"	0.600"				
UT-27	0.575"	0.637"	0.600"				
UT-28	0.546"	0.611"	0.600"				
UT-29	0.548"	0.610"	0.600"				
UT-30	0.559"	0.618"	0.600"				
UT-31	0.552"	0.614"	0.600"				
UT-32	0.561"	0.629"	0.600"				
UT-33	0.572"	0.620"	0.600"				
UT-34	0.551"	0.636"	0.600"				
UT-35	0.585"	0.635"	0.600"				
UT-36	0.574"	0.632"	0.600"				
UT-37	0.555"	0.615"	0.600"				
UT-38	0.564"	0.617"	0.600"				
UT-39	0.570"	0.628"	0.600"				
UT-40	0.561"	0.622"	0.600"				
UT-41	0.535"	0.598"	0.600"				
UT-42	0.565"	0.613"	0.600"				
UT-43	0.570"	0.617"	0.600"				
UT-44	0.543"	0.614"	0.600"				

3" XXH MILL TOLERANCE : 0.525"

3" XH MILL TOLERANCE : 0.263"



ULTRASONIC INSPECTION REPORT

DATE:	AUGUST 17/2011	REPORT #:	UFO-110817-5	PAGE 1 of 1	
CLIENT:	NWP			ECHO JOB #:	5535
CONTRACTOR:	SAME AS ABOVE				
LOCATION:	INNISFAIL SHOP		PROJECT:		
ITEMS EXAMINED:	UT RETURN BENDS				
PROCEDURE:	UT-1		CLIENT JOB # (PO, WO, AFE.):	WO# 08118	
ACCEPTANCE CRITERIA & SPECIFICATION:	(UW-51) ASME VIII DIV. I APP. 12, ASME V, ART. 4				

METHOD

MODE:	☒ Zero Degree	☐ Shear Wave	☐ Specialty:							
EQUIPMENT TYPE:	Panametrics Epoch IV		Serial No.:	81594605		Last Calibration:	FEB 19/2011			
CABLE LENGTH:	70"		COUPLANT:	UT-X						
CAL BLOCK(S):	☐ 1/2" Step	☒ 1" Step	☐ 3/4" ASME	☒ 1 1/2" ASME	☐ DSC	☒ IIW	☐ TEST PIECE:			
REF RELECTOR:	Type:	Perpendicular	Size:			Depth:			Response Ht.:	80% FSH
	ANGLE	WAVE	FREQ	SIZE	MFG.	SER NO.	RANGE	REF DB	SCAN DB	TL DB
1	0	LONG	5MHZ	0.250"	Stressteel	01YB64	25MM	58	6	65
2	45	SHEAR	5MHZ	0.380"	GE	02148D	150MM	39	6	45
3	60	SHEAR	5MHZ	0.380"	GE	02148D	250MM	37	6	43
4	70	SHEAR	5MHZ	0.380"	GE	02148D	350MM	43	6	49

SURFACE CONDITION: ☒ Clean Base Metal ☐ As Ground ☐ Machined ☐ Sand Blast ☐ Painted ☐ Other:

TEST RESULTS

A UT 0 DEGREE WAS PERFORMED ON BELOW RETURN BEND AS REQUESTED BY CLIENT.

	LOW	AVG	NOM
UT-61	0.592"	0.630"	0.600"

*MINIMUM THICKNESS FOR ELBOW FOR MILL TOLERANCE IS 0.525"

Misc Charges	NAME / CERTIFICATION/SIGNATURE FRANCISCO ORELLANA CGSB / SNT-TC-1A LII UT, MT # 12307 	Regular Hours	VIEW
		Overtime Hours	FFO-110817-5
		Shift Premium	
		Kilometers	
Client: (name/approval)		Assistant	LONDON OWEN

53A Burnt Park Drive | Red Deer, AB | T4P 0J7

Ph: (403) 347-7042 Fax: (403) 347-7052 www.echonde.com