

E-635

DE-ETHANIZER OVERHEAD HEATER

Quality Control Documentation



TO: THERMO DESIGN ENGINEERING LTD
BOX 5557 STATION L
EDMONTON ALTA
T6C 4E9

Account # 19971

Date: 98/03/12
Journal # 18739

Attn: JASON HARGREAVES
Re: THERMO DESIGN ENGINEERING LTD

DESIGN REGISTRATION

C.R.N.

N8424.2

Drawings / Documents	Description		
DEETHANIZER OVHD HEATER 9097-0850-212 REV 0 REGISTERED!		MDMT	MAWT
		-----	-----
	Shellside	-20 F	150 F
	Tubeside	-20 F	150 F
			MAWP

			260 psi
			300 psi
	Heat transfer area = 11 sq. ft.		
	Code of Compliance: ASME Sec VIII Div 1, 95 Ed, A96.		

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 174.00

CRN issued in accordance with the ACI Policies on Reciprocal Recognition of Design Review for Registration. Alberta issued CRN N8424.2 on Oct. 10, 1997 for Dwg. # 9037-0220-213 Rev 1 which has same design conditions as above Dwg. # 9097-0850-212 Rev 0.

cb
Encl:
cc:

Yours truly,

R. TUAZON
Design Surveyor

Ministry of
Municipal Affairs
and Housing

Boiler and Elevator
Safety Branch

3rd Floor
750 Pacific Boulevard South - Unit 300
Vancouver BC V6B 5E7

Telephone: (604) 660-6254
Facsimile: (604) 775-2345

ERTIA\AIE\VESSELS\E-63580 Fri Jul 25 14:05:45 1997 UPDATED BY DARIUS

1	RFWN	300#	80	SHOWN	7,10	PROPANE IN
1	RFWN	150#	80	S NN	7,10	PROPANE UI
0	1	CPLG	3000#		14,15	DRAIN c/w PLUG

* - METHOD OF ATTACHMENT PER UW-16.1

IC S:

CONSTRUCTION IN ACCORDANCE WITH ASME CODE, SECTION VIII, DIV. I,
1995 EDITION AND 1996 ADDENDA.

ESSURE: SHELL SIDE: 260 PSIG @ 150°F [1793 kPa @ 66°C].

TUBE SIDE: 300 PSIG @ 150°F [2068 kPa @ 66°C].

C TEST: SHELL SIDE: 390 PSIG [2689 kPa].

TUBE SIDE: 450 PSIG [3103 kPa].

ALLOWANCE: 1/16" [1.59].

HEAT TREATMENT: NO

RY: ALL BUTT WELDS -- FULL.

ESIGN METAL TEMPERATURE: -20°F [-29°C].

XEMPT PER UG-20(f).

WPS#: 861.2 (TDE-1, TDE-3, TDE-4).

FACE PREP: SSPC-SP6, PAINT: ONE COAT ZINC CHROMATE PRIMER, TWO COATS
LIGHT BUFF ALKYD FINISH.

: NONE.

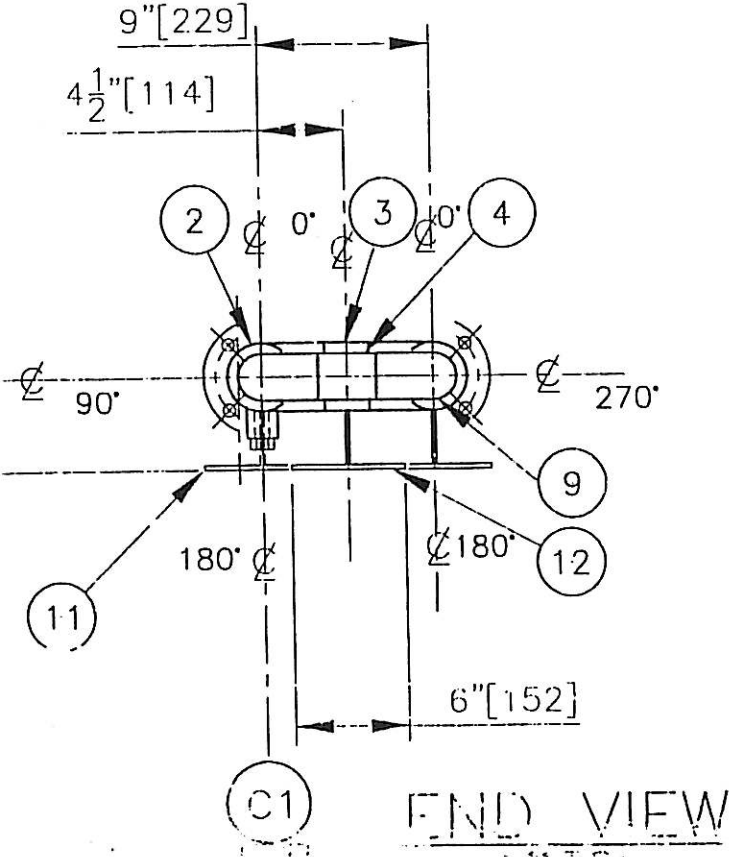
VEIGHT: 1000 LBS [454 kg].

SHELL SIE: 0.5 FT³ [0.01 m³], TUBE SIDE: 0.5 FT³ [0.01 m³].

L WELD SLAG.

BE THOROUGHLY CLEANED INSIDE & OUTSIDE.

PING.



ALBERTA BOILERS SAFETY ASSOCIATION		
PROVINCE OF ALBERTA		
SAFETY CODES ACT		
REG. No.	N-8424-2	
DWG. No.	9037-0220-213 Rev. 1	
	Design Press kPa	Design Temp. °C
SHELL SIDE	1793	-29/+66
TUBE SIDE	2068	-29/+66
ACCEPTED		
OCT 10 1997		
Yr. Mo. Day	Signed M.V.S. Shaikh	
M.V.S. Shaikh, P. Eng. Design Survey Engineer		

CTC

W
RT-1

MANUFACTURED AND CERTIFIED BY
TDE
**THERMO DESIGN
ENGINEERING LTD.**

EDMONTON ALBERTA CANADA

UNIT NAME TAG NUMBER
DEETHANIZER OVERHEAD HEATER E-635

CR. NUMBER SERIAL NUMBER (A) NUMBER
N-8424.21 #1625

M.A.W.P. AT TEMP. M.D.M.T. AT PRESSURE
SG-260 PSIG 150°F -20°F SG-260 PSIG
TS-300 PSIG TS-300 PSIG

YEAR BUILT CORR. ALL DRAWING NUMBER
1998 0.0625 IN 9097-0850-212

DIAMETER LENGTH CAPACITY WEIGHT
3.50 IN OD 20-0 LG 1.0 CU FT 1000 LBS

SHELL MATL. HEAD MATL. TBSHT. MATL. COIL MATL.
SA-106-B SA-234-WPB / SA-106-B
SA-234-WPB SA-234-WPB

SHELL THK. HEAD MIN. THK. TBSHT. THK. COIL THK.
0.216 IN 0.189 IN / 0.218 IN
0.189 IN



MANUFACTURED AND CERTIFIED BY
**THERMO DESIGN
ENGINEERING LTD.**

EDMONTON

ALBERTA

CANADA

UNIT NAME		TAG NUMBER	
REFRIGERANT OVERHEAD HEATER		E-635	
CR. NUMBER	SERIAL NUMBER	A NUMBER	
N-8424-21	1625		
M.A.W.P.	AT TEMP.	M.D.M.T.	AT PRESSURE
CS: 260 PSIG TS: 300 PSIG	150	-20	CS: 260 PSIG TS: 300 PSIG
YEAR BUILT	CORR. ALL.	DRAWING NUMBER	
1998	0.0625IN	9097-0850-2.12	
DIAMETER	LENGTH	CAPACITY	WEIGHT
6.50 IN OD	20.0 IN	160 GALL	1000 LBS
SHELL MATL.	HEAD MATL.	TBSHT. MATL.	COIL MATL.
SA-106-B SA-234-WHA	SA-234-WHA SA-234-WHA		SA-106-B
SHELL THK.	HEAD MIN. THK.	TBSHT. THK.	COIL THK.
0.216 IN	0.1875 IN		0.218 IN



THERMO DESIGN ENGINEERING LTD.

TRAVEL SHEET

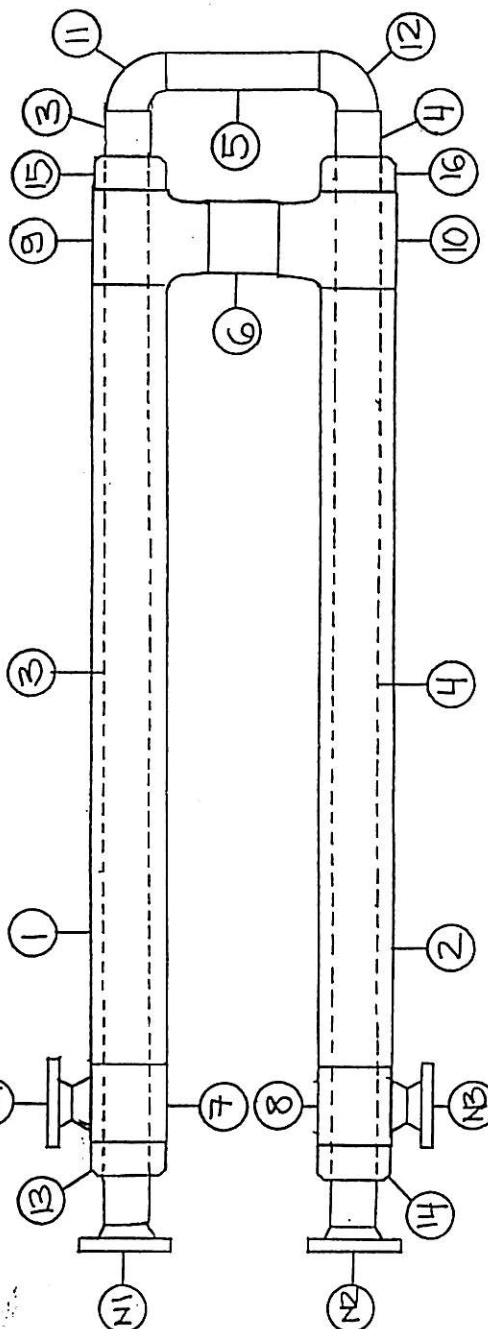
REV.3 APR.15/97
BY: D.C.S.AUTHORIZED INSPECTOR TO BE GIVEN TRAVEL SHEET PRIOR TO CONSTRUCTION
SO THAT HE CAN INDICATE HOLD POINTS. HOLD POINTS ESTABLISHED *KH97-12-12*

(A) NUMBER

VESSEL TITLE		SERIAL NUMBER	TAG NO.	A.I. HOLD POINTS	C.R. NUMBER	JOB CODE
2"Ø x 3"Ø x 20'-0" LG DEETHANIZER OVERHEAD HEATER		#1525	E-635		DATE, FUNCTION COMPLETED AND INSPECTORS INITIALS	
NO.	FUNCTION	COMMENTS		um	T. D. E.	AUTORIZED INSPECTOR
1	APPROVED DRAWINGS				<i>Dec 01. 97 (S)</i>	<i>} KH98-3-23</i>
2	MAT. CHECKED AGAINST DWG.				<i>Dec 01. 97 (S)</i>	
3	MILL TEST CHECKED				<i>Dec 01. 97 (S)</i>	
4	IMPACT TESTS					
5	VESSEL LAYOUT				<i>98.01.06 (S)</i>	
6	FIT UP	SHELL & HEADS			<i>98.01.06 (S)</i>	
7		NOZZL'S & FITTINGS			<i>98.01.06 (S)</i>	
8	INTERNAL INSPECTION			<i>x</i>	<i>98.01.14 (S)</i>	<i>KH98-1-14</i>
9	WELD SIZE				<i>98.01.14 (S)</i>	
10	WELDERS I.D.				<i>98.01.14 (S)</i>	<i>KH98.4</i>
11	RADIOGRAPHS	FULL			<i>98.01.14 (S)</i>	
12	OTHER N.D.E.				<i>98.01.</i>	
13	RELEASE FOR P.W.H.T.	NONE				
14	P.W.H.T. CHART CHECKED					
15	EXTERNAL INSPECTION				<i>98.01.14 (S)</i>	
16	HYDROSTATIC TEST	<i>SS=390 PSIG TS=450 PSIG</i>		<i>x</i>	<i>98.01.14 (S)</i>	<i>S.S. KH98-1-14</i>
17	HYDRO GAUGES	<i>TH-114, TH-115</i>			<i>98.01.14 (S)</i>	
18	DATA REPORT				<i>98.03.20 (S)</i>	
19	NAME PLATES				<i>98.03.20 (S)</i>	

RT-PROGRESS

	PART	SPECIFICATION	HEAT NO.	THK.
PIPES	✓1	SA 106 B	9605E	3" SCH 40
	✓2	SA 106 B	9605E	3" SCH 40
	✓3	SA 106 B	J714309	2" SCH 80
	✓4	SA 106 B	J714309	2" SCH 80
	✓5	SA 106 B	J714309	2" SCH 80
	✓6	SA 106 B	9605E	3" SCH 40
TEES	✓7	SA 234 WPB	TEE	3"x3" SCH 40
	✓8	SA 234 WPB	TEE	3"x3" SCH 40
	✓9	SA 234 WPB	TEE	3"x3" SCH 40
	✓10	SA 234 WPB	TEE.	3"x3" SCH 40
ELBOWS	✓11	SA 234 WPB	ELBOW	2" SCH 80
	✓12	SA 234 WPB	ELBOW	2" SCH 80
CAPS	13	SA 234 WPB	CAP	3" SCH 80
	14	SA 234 WPB	CAP	3" SCH 80
	15	SA 234 WPB	CAP	3" SCH 80
	16	SA 234 WPB	CAP	3" SCH 80
NOZZLES	✓N1	SA 105	RFWN	2" 300#
	✓N2	SA 105	RFWN	2" 300#
	✓N3	SA 105N	RFWN	2" 150#
	✓N4	SA 105N	RFWN	2" 150#





TAQA NORTH DATA										
EQUIP NO.:	603HT004	RAMS ID TAG NO.:	NEW	PRN:	N/A	NAT'L BOARD #:	N/A	CATEGORY:		
PLANT/FIELD:	CHINCHAGA GAS PLANT		LSD:	C-032-H / 094-H-08		LOCATION:	GAS PLANT			
EQUIP. NAME :	DE-ETHANIZER OVERHEAD HEATER			CLASS :	HT		TYPE:	HEATER		
SERVICE:	<input checked="" type="checkbox"/> Sweet	<input type="checkbox"/> Sour	H2S:	PPM		FLUID:	PROPANE		S/D REQT.:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partial
OPERATING PRESSURE:	N/A		<input type="checkbox"/> kPa	<input type="checkbox"/> PSI	OPERATING TEMPERATURE:	20		<input checked="" type="checkbox"/> °C	<input type="checkbox"/> °F	
OPERATING STATUS:	<input checked="" type="checkbox"/> IN SERVICE <input type="checkbox"/> Not In Service			M/WAY(16"AND ABOVE):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	SIZE:	3"			

MANUFACTURING DATA												
MFG.:	THERMO DESIGN LTD		DWG. NO.:	9097-0850-212		SERIAL NO.:	1625		YR. BUILT:	1998	STAMP:	UM, W
CRN:	N8424.21		CODE/DIV.:	ASME VIII DIV 1		PARA.:	N/A		SUPPORT:	<input type="checkbox"/> Skirt <input type="checkbox"/> Saddles <input checked="" type="checkbox"/> Nozzles		
MAWP:	1793	<input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI	@ TEMP:	66	<input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	MDMT:	-29	<input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	VOLUME:	1.0	<input type="checkbox"/> M ³ <input checked="" type="checkbox"/> FT ³	
FLANGE RATING:	150#/300#		PWHT:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	RADIOGRAPHY:	<input type="checkbox"/> RT1 <input type="checkbox"/> RT2 <input type="checkbox"/> RT3 <input type="checkbox"/> RT4	<input type="checkbox"/> Spot <input checked="" type="checkbox"/> Full <input type="checkbox"/> N/A					
SIZE :	89	<input checked="" type="checkbox"/> mm. <input type="checkbox"/> inch.	ID	<input checked="" type="checkbox"/> OD	LENGTH:	6096	<input checked="" type="checkbox"/> mm. <input type="checkbox"/> inch.	HEIGHT:	N/A	<input type="checkbox"/> mm <input type="checkbox"/> inch.		
INSULATION TYPE:	<input type="checkbox"/> Fiberglass <input type="checkbox"/> Wool <input type="checkbox"/> Low Temp <input type="checkbox"/> Asbestos Other: NONE								INSULATION THK:	N/A	<input type="checkbox"/> mm <input type="checkbox"/> inch.	
SECTION	MATERIAL		NOMINAL mm		C.A. mm							
SHELL	SA-106-B/SA-234-WPB		5.5 MM		1.6 MM							
HEAD	SA-234-WPB		4.8 MM		1.6 MM							
COMMENTS:												

TUBING DATA												
MAWP:	2068	<input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI	@ TEMP:	66	<input checked="" type="checkbox"/> °C <input type="checkbox"/> °F	TEMA CLASS:	N/A		TYPE:	N/A		
TUBE SIZE:	51	mm. <input type="checkbox"/> ID <input type="checkbox"/> OD	NUMBER (QTY OF TUBES):	N/A		GAUGE (BWG):	N/S		JOINT:	<input type="checkbox"/> Welded <input type="checkbox"/> Rolled		
SECTION	MATERIAL		NOMINAL mm		C.A. mm							
COIL	SA-106-B		5.5 MM		1.6 MM							

TRAY/PACKING DATA								
TRAY TYPE:	N/A		NUMBER (# OF TRAYS):	N/A		PACKING TYPE:	N/A	
MATERIAL:	N/A		MANUFACTURER:	N/A				

COATING/LINING/CLADDING DATA			
AREA	TYPE	MATERIAL	YR. APPLIED
EXTERNAL:	EPOXY	N/A	N/A
INTERNAL:	N/A	N/A	N/A
LINING:	N/A	N/A	N/A
CLADDING:	N/A	N/A	N/A

PRESSURE RELIEF DEVICES DATA		<input type="checkbox"/> PSV not located		<input type="checkbox"/> No PSV	
EQUIP. NO.	TAG NO.	SET	CAPACITY	CAP UNITS/OTHER	
603SVVT001(TUBE)	N/A	1965 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI	2366	<input checked="" type="checkbox"/> SCFM <input type="checkbox"/> LB/hr. <input type="checkbox"/> GAL/min.	
603SVVS012(SHELL)	N/A	1793 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI	14992	<input checked="" type="checkbox"/> SCFM <input type="checkbox"/> LB/hr. <input type="checkbox"/> GAL/min.	
N/A	N/A	N/A <input type="checkbox"/> kPa <input type="checkbox"/> PSI	N/A	<input type="checkbox"/> SCFM <input type="checkbox"/> LB/hr. <input type="checkbox"/> GAL/min.	

FORM U-3 MANUFACTURER'S CERTIFICATE OF COMPLIANCE COVERING PRESSURE VESSELS

TO BE STAMPED WITH THE UM SYMBOL. SEE 1 (i)

As Required by Provisions of the ASME Code Rules, Section VIII, Division 1

CTC PG. 1 OF 2

1. Manufactured and certified by THERMO DESIGN ENGINEERING LTD., 1624 - 70 AVENUE, EDMONTON, ALBERTA CANADA T6P 1P5

(Name and address of manufacturer)

2. Manufactured for Chauvco Res. Ltd. c/o Tartan Eng. Ltd., 1700, 800 - 6th Avenue S.W., Calgary, AB T2P 3G3

(Name and address of purchaser)

3. Location of installation Chinchaga Gas Plant, British Columbia, LSD: C-32-H/94-H-8

(Name and address)

4. Type Horizontal Deethanizer Overhead Heater

(Horiz., vert. or sphere)

(Tank, separator, etc.)

(Capacity)

#1625

(Mfg's serial No.)

N-8424.21

9097-0850-212 Rev.0

1998

(CRN)

(Drawing no.)

(Year built)

5. ASME Code, Section VIII, Div. 1 Edition 1995, Addenda 1997

Edition and Addenda (Date)

Code Case No.

6. Shell: (a) No. of course(s): 3 (b) Overall length (ft & in.): 20'-0" LG Total

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	3.07" ID	6 3/4"	SA-234-WPB		0.216"	0.0625"	BW Tee	Full	100	Sgl 'V'	Full	100	N/A	N/A
2	3.07" ID	8'-9"	SA-106-B		0.216"	0.0625"	Smls Pipe	Full	100	Sgl 'V'	Full	100	N/A	N/A
3	3.07" ID	6 3/4"	SA-234-WPB		0.216"	0.625"	BW Tee	Full	100	Sgl 'V'	Full	100	N/A	N/A

7. Heads: (a) SA-234-WPB N/A(b) SA-234-WPB N/A

(Mat'l Spec No., Grade or Type) H.T. - Time & Temp.

(Mat'l Spec No., Grade or Type) H.T. - Time & Temp.

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	Top	0.189"	0.625"								Concave	Sgl 'V'	Full	100
(b)	Bottom	0.189"	0.625"								Concave	Sgl 'V'	Full	100

If removable, bolts used (describe other fastening)

N/A

(Mat'l Spec. No., Grade, Size, No.)

8. Type of Jacket N/A

Jacket Closure

N/A

(Describe as ogee & weld, bar, etc.)

If bar, give dimensions, if bolted describe or sketch N/A9. MAWP 260 N/A psi at max. temp. 150 N/A ° F Min. design metal temp. -20 ° F at 260 psi.

Internal

External

Internal

External

10. Impact test No, Exempt per UG-20(f)

(Indicate yes or no and the component(s) impact tested)

11. 2, pne., or comb. test press. 390 PSIG

Proof test

Hydrotest

12. 2 les, inspection, and safety valve openings:

Purpose (Inlet Outlet, Drain)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
N1	1	2"	RFWN	SA-106-B	SA-105	0.218"	0.0625"	N/A	B.W.	Welded	Tube End
N2	1	2"	RFWN	SA-106-B	SA-105	0.218"	0.0625"	N/A	B.W.	Welded	Tube End
N3	1	2"	RFWN	SA-234-WPB	SA-105	0.218"	0.0625"	N/A	B.W.	Welded	Shell
N4	1	2"	RFWN	SA-234-WPB	SA-105	0.218"	0.0625"	N/A	B.W.	Welded	Shell
C1	1	3/4"	CPLG	SA-105	N/A	3000#	0.0625"	N/A	JW-16.1(c)	N/A	Shell

13. Supports: Skirt No Lugs No Legs No Other No Shoes No Attached No Welded No

(Yes or no)

(No.)

(No.)

(Describe)

(Where and how)

14. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:

(List the name of part, item number, mfg's. name and identifying number)

15. Remarks: 2" Dia. x 3" Dia. x 20'-0" LG Deethanizer Overhead Heater "E-635"Capacity: 1.0 cu.ft. Heating Surface: Approx. 11.4 sq.ft. PSV: On PipingTubesheet: None; 1 Tube: SA-106-B, 2.375" OD, 0.218" Nom.Thk.Registered Drawing No.: Alberta: 9037-0220-213/R.1, B.C.: 9097-0850-212/R.0

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.

UM Certificate of Authorization No.

22,145

Expires

August 22

, 19

99

Date 28.03.95

Name

THERMO DESIGN ENGINEERING LTD.

Signed

B. Thorne

(Manufacturer)

(Representative)

CTC, Page 2 of 2

(Name and address of Manufacturer)

(Name and address of Purchaser)

(Name and address)

#1625

(Mfg's serial No.)

1998

(Year built)

Remarks

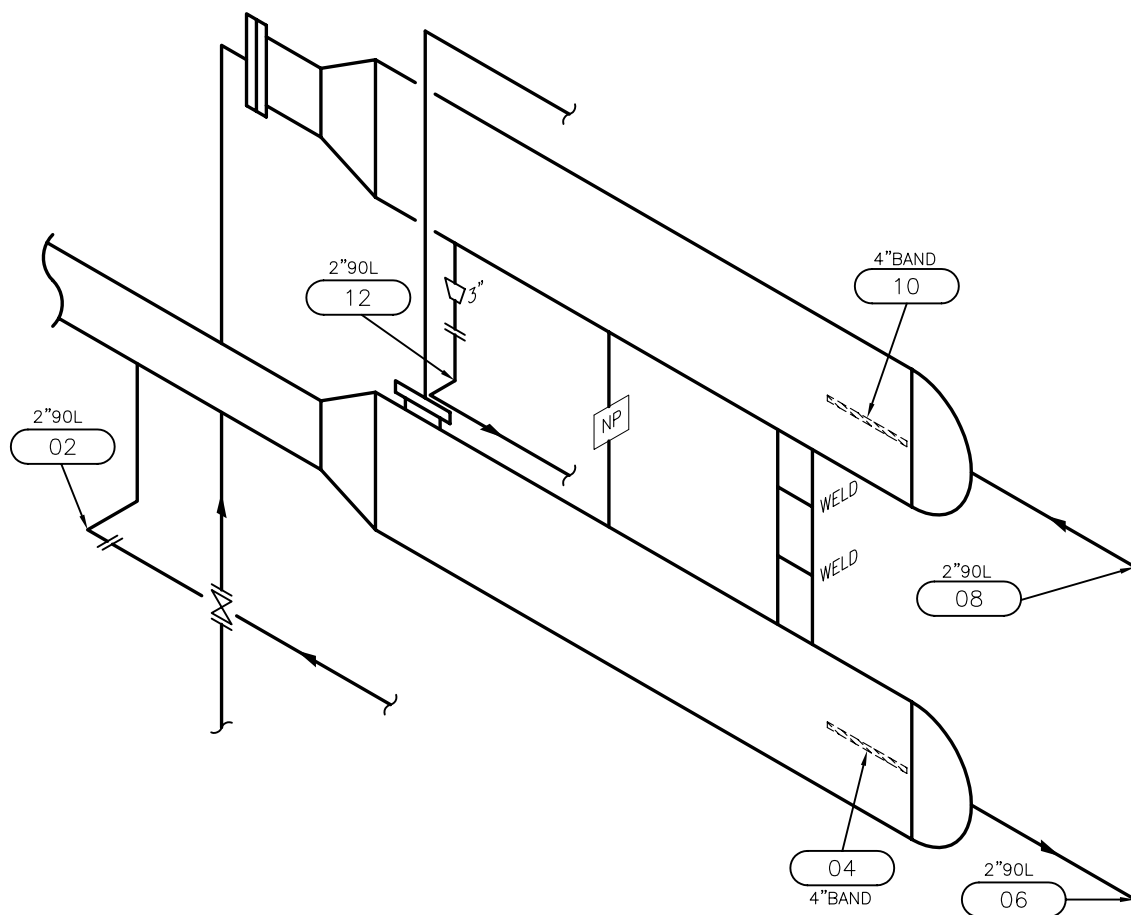
Hydrotest: 450 PSIG

(Manufacturer)

(Representative)

(Authorized Inspector)

(Nat'l Board (incl. endorsements) State, Province and No.)



P.E. No.: N/S Yr. Bit.: 1998
 OIP# 603HT004 Manway: NO
 Serial No.: 1625 Size: 89mm x 6096mm
 P.R.N. ④ N/S Service: SWEET
 C.R.N.: N8424.21 PWHT: NO
 Code/Div.: ASME VIII DIV. 1 RT: FULL
 Para: N/S Insulated: N/S
 C. Stamp: W N.B. No: N/S
 Manufacturer: THERMO DESIGN LTD.

Design & Materials Data

HEAD	SHELL
Material: <u>SA-234-WPB</u>	Material: <u>SA-106-B/SA-234-WPB</u>
Nom.: <u>4.8mm</u>	Nom.: <u>5.5mm</u>
C.A.: <u>1.6mm</u>	C.A.: <u>1.6mm</u>
BOOT HEAD	BOOT SHELL
Material: _____	Material: _____
Nom.: _____	Nom.: _____
C.A.: _____	C.A.: _____
CHANNEL HEAD	CHANNEL SHELL
Material: _____	Material: _____
Nom.: _____	Nom.: _____
C.A.: _____	C.A.: _____
MAWP Shell Side: <u>1793 KPA</u>	⑥ Temp.: <u>66°C</u>
MAWP Tube Side: _____	⑥ Temp.: _____

CLIENT

TAQA NORTH

FACILITY

CHINCHAGA GAS PLANT

LSD C-032-H/094-H-08

ITEM

DE-ETHANIZER OVERHEAD HEATER

Comments: _____

BY: M.T.

DATE: 2008/04

DWG.# 025

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	DEETHANIZER OVERHEAD HEATER	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603HT004	RECOMMENDED NEXT INSP. DATE:	12/2009
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2012
SERIAL #:	1625	REM. LIFE (from last survey 04/2008):	3.80 yrs.
CRN.:	N8424.21	TOTAL CAUTION / ACTION TML:	0

Item # (025)

TML No.: 2 2"90L S-E 150

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 4.32 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 4.00 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
2.01	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.00	0.000	0.000	04/2013	04/2208	NO
2.02	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.40	0.000	0.000	04/2013	08/2341	NO
2.03	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.40	0.000	0.000	04/2013	08/2341	NO
2.04	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.20	0.000	0.000	04/2013	12/2274	NO
2.05	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.60	0.000	0.000	04/2013	04/2408	NO

TML No.: 4 4" BTM BAND N-S

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.92 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.90 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
4.01	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	5.90	0.000	0.000	04/2013	12/2674	NO
4.02	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	5.90	0.000	0.000	04/2013	12/2674	NO
4.03	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	5.90	0.000	0.000	04/2013	12/2674	NO
4.04	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	5.90	0.000	0.000	04/2013	12/2674	NO
4.05	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	5.90	0.000	0.000	04/2013	12/2674	NO
4.06	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	6.00	0.000	0.000	04/2013	04/2708	NO

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	DEETHANIZER OVERHEAD HEATER	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603HT004	RECOMMENDED NEXT INSP. DATE:	12/2009
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2012
SERIAL #:	1625	REM. LIFE (from last survey 04/2008):	3.80 yrs.
CRN.:	N8424.21	TOTAL CAUTION / ACTION TML:	0

Item # (025)

TML No.: 6 2"90L S-E

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.04 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 4.90 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
6.01	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	4.90	0.000	0.058	02/2009	12/2009	NO *
6.02	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.00	0.000	0.048	05/2010	05/2012	NO *
6.03	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.00	0.000	0.048	05/2010	05/2012	NO *
6.04	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.10	0.000	0.038	03/2012	02/2016	NO
6.05	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.20	0.000	0.030	04/2013	05/2021	NO

TML No.: 8 2"90L W-N

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.00 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.00 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey	Prev. Survey Date mm/yyyy	Prev. Survey	Last Survey Date mm/yyyy	Last Survey	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
8.01	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.00	0.000	0.048	05/2010	05/2012	NO *
8.02	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.00	0.000	0.048	05/2010	05/2012	NO *
8.03	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.00	0.000	0.048	05/2010	05/2012	NO *
8.04	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.00	0.000	0.048	05/2010	05/2012	NO *
8.05	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.00	0.000	0.048	05/2010	05/2012	NO *

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	DEETHANIZER OVERHEAD HEATER	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603HT004	RECOMMENDED NEXT INSP. DATE:	12/2009
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	02/2012
SERIAL #:	1625	REM. LIFE (from last survey 04/2008):	3.80 yrs.
CRN.:	N8424.21	TOTAL CAUTION / ACTION TML:	0

Item # (025)

TML No.: 10 4" BTM BAND S-N

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.93 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.70 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
10.01	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	6.10	0.000	0.000	04/2013	08/2741	NO
10.02	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	6.10	0.000	0.000	04/2013	08/2741	NO
10.03	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	5.80	0.000	0.000	04/2013	08/2641	NO
10.04	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	5.80	0.000	0.000	04/2013	08/2641	NO
10.05	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	5.70	0.000	0.000	04/2013	04/2608	NO
10.06	5.50	1.60	3.90	01/1998	5.50	N/A	N/A	04/2008	6.10	0.000	0.000	04/2013	08/2741	NO

TML No.: 12 2"90L T-B 150

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 4.04 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 3.70 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
12.01	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.30	0.000	0.000	04/2013	04/2308	NO
12.02	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.30	0.000	0.000	04/2013	04/2308	NO
12.03	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	4.20	0.000	0.000	04/2013	12/2274	NO
12.04	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.70	0.000	0.020	04/2013	01/2023	NO
12.05	3.90	0.50	3.40	01/1998	3.90	N/A	N/A	04/2008	3.70	0.000	0.020	04/2013	01/2023	NO

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	De-Ethanizer Heater	A No:	BC	MTL No: HTR200
Internal Coating Type:		Next External:	2/6/2003	Next Internal: Feb, 2004
Vessel Orientation:	Horizontal	Internal Coating Lining:	0	
Vessel Type:	Fired Heater	Fluid Type:		
Tag No:	E-635	Serial Number:	1625	
Separator Type:		Business Unit:		
Direct Fired Vessel:	N/A	Fired Tube:		Cost Centre:
Current Status:	In Service	Flame Arrester Date Required:		Date
Thermal Insulation:	No	Asbestos:	No	

PRESSURE VESSEL NAMEPLATE INFORMATION

MTL Number:	HTR200	Volume:	1.000 F3	CRN Number:	N-8424-21	Registered:	No
Serial Number:	1625	Size:	3.500 in O.D. x 20 ft	0 in Overall			
Drawing Number:	9097-0850-212	P & ID Number:					
Shell Material:	SA-106-B	Bottom	Shell Thickness:	0.216 In			
		Top	Shell Thickness:	0.216 In			
Head Material:	SA-234WPB	Bottom	Head Thickness:	0.189 In			
		Top	Head Thickness:	0.189 In			
Tube Material:		Tube Size(OD):	In	Tube Thickness:	In		
Tubesheet Material:		Tubesheet Thickness:	In				
Channel Material:		Channel Type:		Channel Thickness:	In		
Design Pressure:	Shell: 260 psi	Operating Pressure:	Shell: psi				
	Tube: 300 psi		Tube: psi				
Design Temperature:	Shell: 150 F	Operating Temperature:	Shell: F				
	Tube: 150 F		Tube: F				
RT (XRay):	RT2	Heat Treatment:	No				
Code Parameters:		Joint Efficiency:					
Manufacturer:	Thermo Design Engineering	Year Built:	1998				
Corrosion Allowance:	0.063	Manway:	No				

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	De-Ethanizer Heater	A No:	BC	MTL No: HTR200

VESSEL SHELL / HEADS / PIPING

External / Instrumentation Condition

The external surface of this vessel was noted in good condition. The paint was also in good condition with no evidence of corrosion. The pressure retaining welds were intact and revealed no signs of deterioration or visible cracking. The associated instrumentation appeared to be in good working order.

Internal Condition

No internal access

Nozzle Condition

The external surface of the nozzle assemblies and associated welds are intact with no evidence of degradation and therefore noted in good condition.

Flange Condition

The flanges are bolted properly and there was no visible evidence of leakage.

Internal Piping

Not Applicable

External Piping

The piping was painted with some minor rust noted. The associated pressure welds were intact and revealed no signs of deterioration or visible cracking.

Pipe Support Condition

The associated pipe supports were in good condition with no evidence of any mechanical damage or degradation.

Bolting Condition

The associated bolting and gaskets were in place and appeared to be tight.

Firetube Condition

Not Applicable

Demister Pad Condition

Not Applicable

Anode Condition

Not Applicable

Vessel Support

The vessel was properly secured to the structural base.

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	De-Ethanizer Heater	A No:	BC	MTL No: HTR200

VESSEL COATING INSPECTION

Type of Coating

Coating Manufactuer and Type

Location

Coating Condition

VESSEL NONDESTRUCTIVE TESTING

NDE Type	UT Survey			
Location of Test				
Contractors Name	Rivest	Qualifications		
Last UT Survey Date	Feb 3, 2002	Interval	2 yrs	Next UT Date: Feb 3, 2004
Survey By	MTL Testing Inc.			
Test Results				

VESSEL STATUS

Suitable for Further Service?	Yes	Repairs Required?	No
Owners Representative		Repairs Completed?	
Owners Date		Repairs Completed By	
		Repair Date	

Recommendations

Next external inspection in 3 years
Next PSV servicing in 3 years
Next UT Survey in 3 years

Details of Repairs

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION


Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	De-Ethanizer Heater	A No:	BC	MTL No: HTR200

PSV DATA

Side	Set Pressure psi	CRN Number	Manufacturer PSV Number	Model Serial Number	Capacity	Size Inches	Set Date
Tubeside	285		Mercer PNR3302	81-28621111 56608	2366 SCFM	1.5 x	Dec/1999
Shellside	260		Farris PNR6302	2850 CE-1699-6-R4	3451 SCFM	1.5 x	Dec/1999

CURRENT VESSEL PROCESS CONDITIONS

Sweet Gas

Name (Printed)	Signature	Date
Visual Inspector Paul Gorman API510		February 06, 2002
QA Supervisor: (Chief Inspector)		
QA Administrator:		
ABSA Inspector:		

EQUIPMENT NO: 603Ht004

Page of

FACILITY: Chinchaga Gas Plant

PROV. REG. NO:

EQUIPMENT NAME: De-ethanizer Overhead Heater

TAG NO:

SIZE: 89mm OD x 6096mm L/H

MAWP: 1793 kPa @ 66/-29 °C

LSD : C-032-H / 094-H-08

MANWAY ☐ YES ☒ NO

SERVICE:

FLUID: Propane

☐ SOUR ☒ SWEET ☐ CRYOGENIC

SCOPE OF INSPECTION

TYPE OF INSPECTION:

CLEANING:

ACCESS:

☐ PRECOMMISSIONING

☐ AE

☐ MT

☐ RT

☒ GOOD

☐ FULL

☒ INITIAL

☐ ET

☐ MFL

☒ UT

☐ FAIR

☐ PARTIAL

☐ REINSPECTION

☐ LT

☐ PT

☒ VT

☐ INADEQUATE

☒ EXTERNAL

☐ OTHER

PLEASE ADD PAGES AND SKETCHES AS NEEDED (TURN OVER FOR SKETCH)

OBSERVATIONS:

☒ EXTERNAL

1. LADDERS, STAIRWAYS, PLATFORMS AND WALKWAYS ☒

2. FOUNDATIONS AND SUPPORTS ☒

3. NOZZLES ☒

4. GROUNDING CONNECTIONS ☒ Skid has a ground cable attached , Heater is spot welded to an I-beam

5. PROTECTIVE COATINGS AND INSULATION ☒

6. EXTERNAL METAL SURFACES ☒ I-beam

7. FANS AND OTHER ANCILLARY EQUIPMENT ☐ N/A

8. PRESSURE RELIEF DEVICES ☒

9. NAME PLATE ☒

10. ULTRASONIC INSPECTION SURVEY ☒

11. INSPECTION REPORT COMPLETED ☒

12. NON CONFORMANCE COMPLETED ☐ N/A

13. OIP LABEL APPLIED ☒

14. PICTURE ON FILE ☒

COMMENTS

CHECKED BOX INDICATES ACCEPTANCE

RECOMMENDATIONS:

SUITABLE FOR

REMEDIAL ACTION

FURTHER SERVICE: ☒ YES ☐ NO

PRIORITY: ☐ HIGH ☐ MEDIUM ☐ LOW

INSPECTION PERFORMED BY: Mark Tomko

DATE OF INSPECTION 07 04 2008
(DD MONTH YYYY)

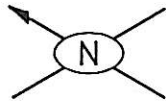
FOLLOW-UP INSPECTION REQ'D:

☐ YES ☒ NO

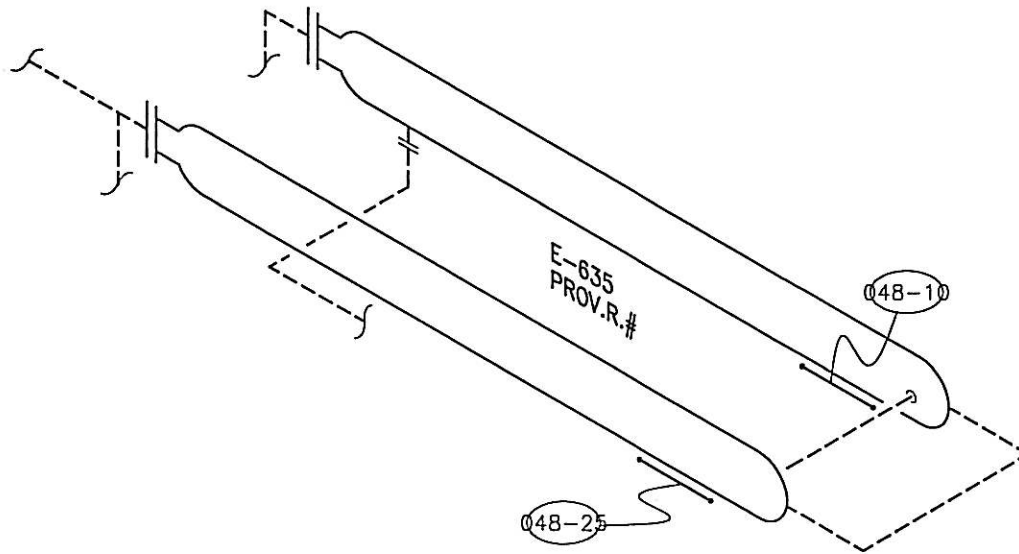
BY DATE:

(DD MONTH YYYY)

025



P&ID. # _____
REF. # _____



VESSEL DATA

Prov. Reg. No. _____ C.R.N. N 8424.21 P.E. No. E-635 Serial No. _____
MFR. THERMO DESIGN Code/Div. _____ Para _____ Code Stamp _____
Yr. Bld. 1998 Yr. Inst. _____ Size 3.5"ØX20' Vol.: _____ Service _____ PWHT _____

Nominal Thickness & Material

Head: 0.189" Mat'l: SA 234 WPB C.A.: 1.6mm

Head: _____ C.A.: _____

Shell: 5.5mm SA 106 B C.A.: 1.6mm

Shell: _____ C.A.: _____

Chan Hd: _____ C.A.: _____

Chan Sh: _____ C.A.: _____

Gas Boot Hd: _____ C.A.: _____

Gas Boot Sh.: _____ C.A.: _____

Liq. Boot Hd.: _____ C.A.: _____

Liq Boot Sh.: _____ C.A.: _____

MAWP Shell Side 260psi @ Temp. 150°F

MAWP Tube Side 300psi @ Temp. 150°F

Insulated NO2 R.T. _____

Repairs _____

COMMENTS _____

PIONEER NATURAL RESOURCES CANADA INC.

CHINCHAGA GAS PLANT

LSD C-32-H \ 94-H-8

DE-ETHANIZER O/H HEATER

TECH.: J.OLIVER REV.DATE: _____ DWG DATE: 02/2002

CAD: MKM REVISION: _____ DRAWING: 048

Equip No E-635

Serial No N/A

Prov Reg No N/A

Description DEETHANIZER O/ H HEATER

048 - 010

TML Description: BTM. SHELL S. END

T Nominal: 5.5

Min Nominal: 3.9

Corr Allowance: 1.6

*Data Readings**Data Evaluations*

Months Remaining to T Min: 999
 Min Calc'd Wall Thickness: N/A
 Thick Remain Above T Min: 1.9
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: N/A
 Lowest Value - Last Reading: 5.8

Comment:

	Dec-99	Feb-02
Point 1	5.8	5.8
Point 2	5.8	5.8
Point 3	5.9	5.9
Point 4	5.8	5.9
Point 5	6.0	5.9
Point 6	5.9	5.9
Point 7		
Point 8		
Point 9		
Point 10		
Point 11		
Point 12		
Average	5.9	5.9
Avg Low 3	5.8	5.8
Lowest	5.8	5.8

048 - 015

TML Description: 2" 90

T Nominal: 5.5

Min Nominal: 3.9

Corr Allowance: 1.6

*Data Readings**Data Evaluations*

Months Remaining to T Min: 999
 Min Calc'd Wall Thickness: N/A
 Thick Remain Above T Min: 1.4
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: N/A
 Lowest Value - Last Reading: 5.3

Comment:

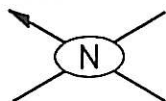
	Dec-99	Feb-02
Point 1	5.5	5.6
Point 2	5.3	5.3
Point 3	5.5	5.5
Point 4	5.5	5.5
Point 5	5.8	5.5
Point 6		
Point 7		
Point 8		
Point 9		
Point 10		
Point 11		
Point 12		
Average	5.5	5.5
Avg Low 3	5.4	5.4
Lowest	5.3	5.3

048 - 020

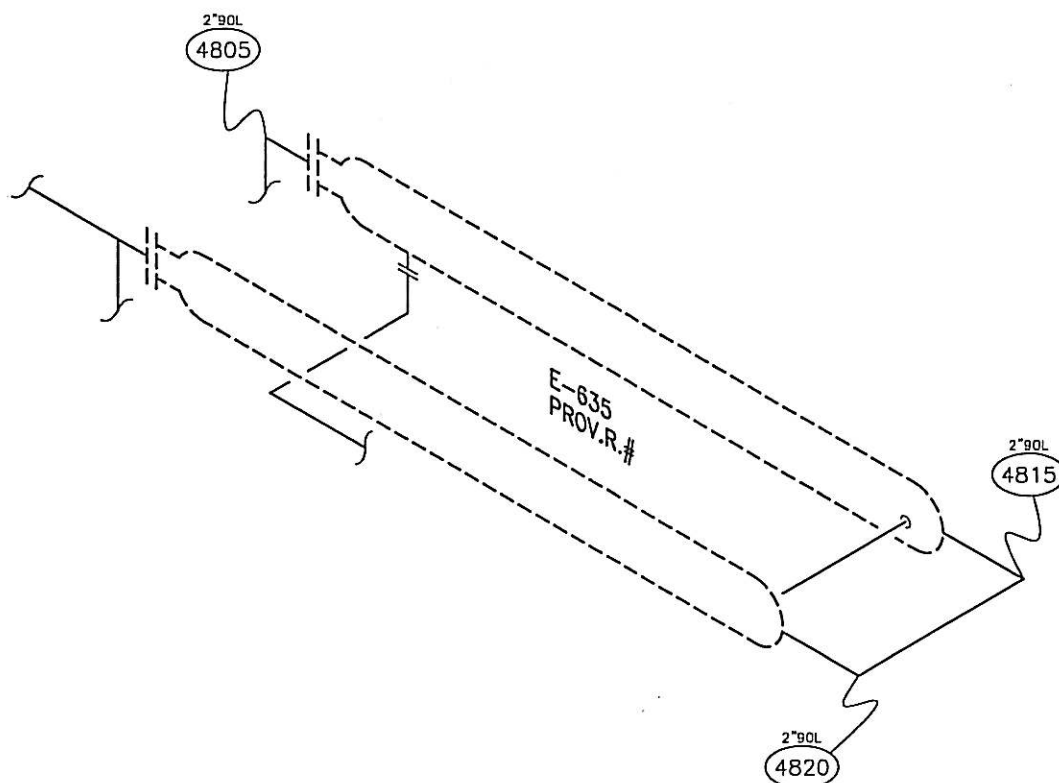
TML Description: 2" 90' L R-L			
T Nominal: 5.5			
Min Nominal: 3.9			
Corr Allowance: 1.6			
<i>Data Readings</i>			
<i>Data Evaluations</i>		Dec-99	Feb-02
Months Remaining to T Min: 999		Point 1	5.5 5.5
Min Calc'd Wall Thickness: N/A		Point 2	5.4 5.4
Thick Remain Above T Min: 1.5		Point 3	5.7 5.7
Short Term Corr Rate: N/A		Point 4	5.6 5.6
Long Term Corr Rate: N/A		Point 5	5.6 5.7
Months Remain to LFL: N/A		Point 6	
Lowest Value - Last Reading: 5.4		Point 7	
Comment:		Point 8	
		Point 9	
		Point 10	
		Point 11	
		Point 12	
		Average	5.6 5.6
		Avg Low 3	5.5 5.5
		Lowest	5.4 5.4

048 - 025

TML Description: BTM. SHELL S. END			
T Nominal: 5.5			
Min Nominal: 3.9			
Corr Allowance: 1.6			
<i>Data Readings</i>			
<i>Data Evaluations</i>		Dec-99	Feb-02
Months Remaining to T Min: 999		Point 1	5.9 5.8
Min Calc'd Wall Thickness: N/A		Point 2	5.8 5.8
Thick Remain Above T Min: 1.9		Point 3	5.8 5.8
Short Term Corr Rate: N/A		Point 4	6.0 5.8
Long Term Corr Rate: N/A		Point 5	5.9 5.8
Months Remain to LFL: N/A		Point 6	5.8 5.9
Lowest Value - Last Reading: 5.8		Point 7	
Comment:		Point 8	
		Point 9	
		Point 10	
		Point 11	
		Point 12	
		Average	5.9 5.8
		Avg Low 3	5.8 5.8
		Lowest	5.8 5.8



P&ID. # _____
REF. # _____



PIPING DATA

TML	SIZE	MAT'L	FLG. RATING	PROC.	LINE #	SPEC.	SCH.	CORR.ALL				CAL. THK.	CODE
								NOM.	** DESIGN	MIN.			
4805	2"						80	5.5mm	ASTM	4.8mm			
4815/20	2"						80	5.5mm	* 1.6mm	3.2mm			

COMMENTS: _____

PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT
LSD C-32-H \ 94-H-8

DE-ETHANIZER O/H HEATER PIPING

TECH.: J.OLIVER REV.DATE: _____ DWG DATE: 02/2002
CAD: MKM REVISION: _____ DRAWING: 048A

Equip No N/A

Serial No N/A

Prov Reg No N/A

Description

048 - 005

TML Description: 2" 90' L B-T

T Nominal: 5.5

Min Nominal: 4.8

Corr Allowance: ASTM

*Data Readings**Data Evaluations*

Months Remaining to T Min: 999
 Min Calc'd Wall Thickness: N/A
 Thick Remain Above T Min: 1.1
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: N/A
 Lowest Value - Last Reading: 5.9

Comment:

	Dec-99	Feb-02
Point 1	6.1	6.1
Point 2	5.9	5.9
Point 3	6.3	5.9
Point 4	6.5	6.0
Point 5	6.6	6.0
Point 6		
Point 7		
Point 8		
Point 9		
Point 10		
Point 11		
Point 12		
Average	6.3	6.0
Avg Low 3	6.1	5.9
Lowest	5.9	5.9

RAM#	433819	EQUIP STATIC RECORD		JOB#	1-2968
Unique OUP #:	603HT004	Old OUP #:		LSD:	C-032-H/094-H-08

TANK M/WAY OD FLANGE DIMENSIONS: _____ x _____ mm OR IF M/WAY IS ROUND, DIA. IS: _____ mm

TK. HEATED: _____ TYPE OF HEAT: _____ TK. SKIDDED or PORTABLE: _____ GAS BLANKET: _____ DOUBLE WALL: _____

TK. CONSTRUCTION: _____ TANK DYKED: _____ DYKE MATERIAL: _____ Leak Tag#: _____

DYKE LINED: _____ TYPE of LINER: _____ Leak Test Co. _____ Leak Test Date _____

DYKE SHAPE: _____ mm Width: _____ mm Height: _____ mm

DYKE VOLUME: _____ m³ TK. BASE SITTING ON: _____ BETWEEN TK. AND BASE: _____

TANKS INSIDE DYKE: _____

P&ID #: _____ SHUT DOWN: _____

OPERATING PRESSURE: _____ kPa OPERATING TEMP. **20** °C YEAR PUT IN SERVICE: _____

VESSEL CONNECTIONS: NPT _____ FLANGE Yes LARGEST CONNECTION _____ mm INSPECTION PORT: None

FLANGE ANSI: **300** FLG. FACE: _____ SIZE of INSPECTION PORT: _____ mm

VESSEL ORIENTATION: Horizontal TYPE OF VESSEL SUPPORT: Saddle IS BOTTLE (VB) BLOCKED: _____

TRAY(VT): _____ # of TRAYS _____ MAT'L _____ MFG. _____

PACKING(VK): _____ EXT. INSULATED: _____ Full or Partially covered? _____

INSULATION TYPE: _____ CLADDING: _____

TYPE of EXT. INSULATION: _____ EXT. INSULATION THICKNESS: _____ mm CUI Susceptible: _____

EXT. COATING: Enamel Paint INTERNAL COATING: _____ INTER. LINING: _____

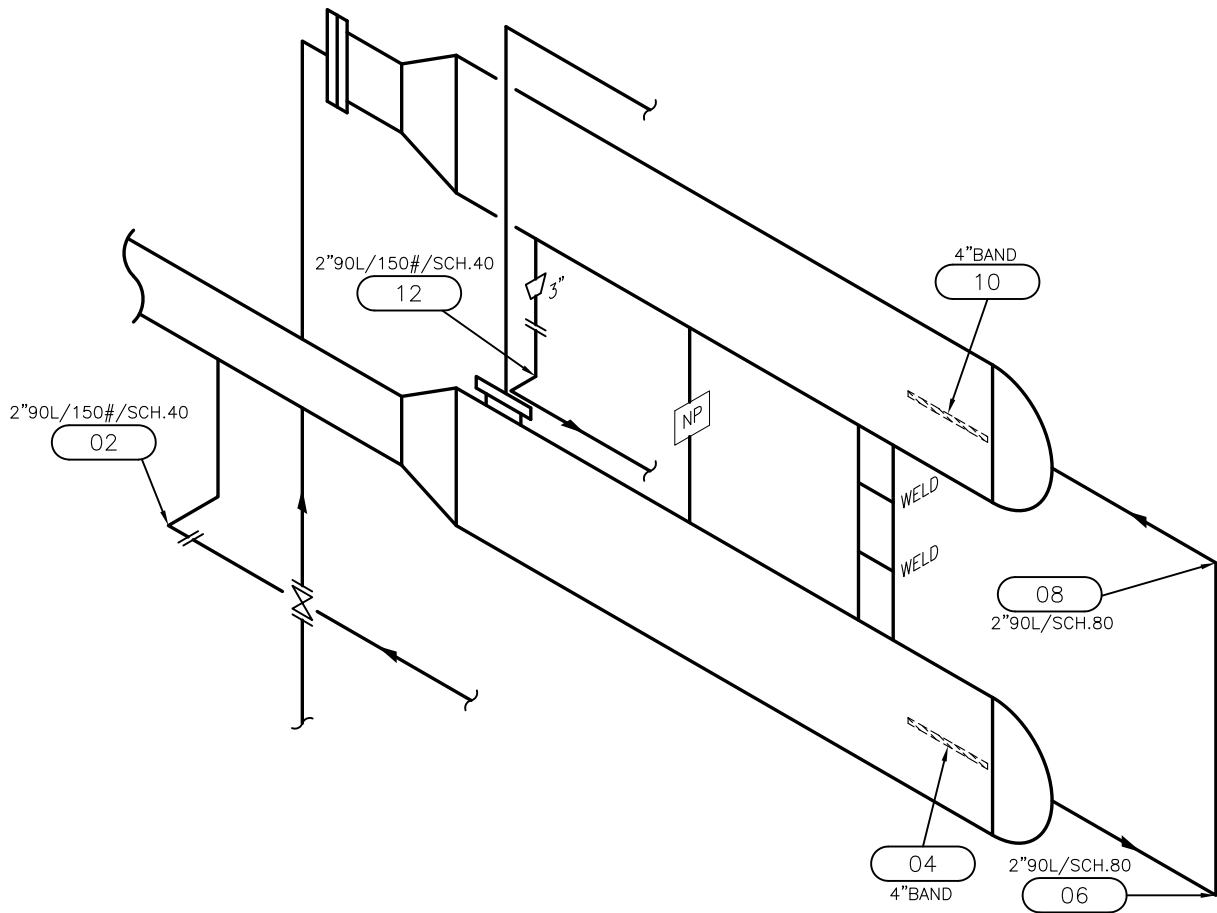
PRESSURE RELIEF DATA

PSV OUP#	SET PRESSURE	units	CODE: SV, SR, ST, SL or ESD PROTECTS - TANK, SHELL, TUBE (HA or HT), HP coil, LP coil, FG coil, HS coil (heat string coil in line heater), PL, PP, Channel A or B in HP
603SVVT001	1965	kPa	Tube
603SVVS013	1793	kPa	Tube
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	

ITS
PRINT NAME: Murray Angus MacGregor

ITS
SIGNATURE:

DATE: data collected - yyyy-mm-dd 2014-Oct-18



<input type="checkbox"/> Column <input type="checkbox"/> Cooler <input type="checkbox"/> Exchanger <input type="checkbox"/> Furnace <input type="checkbox"/> Heater <input type="checkbox"/> Plate Exchanger <input type="checkbox"/> Reboiler <input checked="" type="checkbox"/> Vessel <input type="checkbox"/> Other							Client:, District:, LSD:, Etc.:			
Description:		DE-ETHANIZER OVERHEAD HEATER					TAQA NORTH CHINCHAGA GAS PLANT C-032-H/094-H-08			
P.R.N. No.:		N/S	C.R.N.:		N8424.21					
Equipment No.: OIP		603HT004	N.B. No.:							
Serial No.:		1625	Other:							
HEAD Material:		SA-234-WPB	Nom.:	4.800mm	C.A.:	1.588mm				
HEAD Material:			Nom.:				Tech.: A.L.N. Date: 10/2014 ITS Job No.: 1-2968(I) DWG No.: 025			
SHELL Material:		SA-106-B	Nom.:	5.486mm	C.A.:	1.588mm				
SHELL Material:		SA-234-WPB	Nom.:	5.486mm						
MAWP Shell Side:		1793 KPA	@Temp.:	66°C/-29°C						

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	DEETHANIZER OVERHEAD HEATER	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603HT004		
PROV. REG. #:	N/S	VESSEL CORROSION ALLOWANCE:	1.59 mm.
SERIAL #:	1625		
CRN.:	N8424.21	TOTAL CAUTION / ACTION TML:	9

Item # (025)

COMMENTS:

2014/10 - TML 06 AND 08 - AS PER TAQA NORTH PRESSURE PIPING PROCEDURE THE MINIMUM WALL REQUIRED IS 2.54MM FOR A 2" COMPONENT WITH 150# FLANGE RATING. BY WILL RETTMAN.

TML No.: 2 2"90L S-E 150

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 3.82 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 3.50 mm.

Pts.	Nom. Thick. mm.	CA + Steel Mfg.Tol. mm.	Nom. -CA -Toll. mm.	B/L Survey Thick. mm.	Prev. Survey Thick. mm.	Last Survey Thick. mm.	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm-yyyy mm.	Action/Caution Required Item
				01/1998	04/2008	10/2014					
2.01	3.91	0.49	3.42	3.91	4.00	3.50	0.0762	0.0254	0.53	.	CAUTION *
2.02	3.91	0.49	3.42	3.91	4.40	3.80	0.0914	0.0076	2.08	.	CAUTION *
2.03	3.91	0.49	3.42	3.91	4.40	3.80	0.0914	0.0076	2.08	.	CAUTION *
2.04	3.91	0.49	3.42	3.91	4.20	3.90	0.0457	0.0000	5.25	.	CAUTION *
2.05	3.91	0.49	3.42	3.91	4.60	4.10	0.0762	0.0000	4.46	.	CAUTION *

TML No.: 4 4" BTM BAND N-S

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.58 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.50 mm.

Pts.	Nom. Thick. mm.	CA + Steel Mfg.Tol. mm.	Nom. -CA -Toll. mm.	B/L Survey Thick. mm.	Prev. Survey Thick. mm.	Last Survey Thick. mm.	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm-yyyy mm.	Action/Caution Required Item
				01/1998	04/2008	10/2014					
4.01	5.49	2.28	3.21	5.49	5.90	5.60	0.0457	0.0000	26.14	.	NO
4.02	5.49	2.28	3.21	5.49	5.90	5.60	0.0457	0.0000	26.14	.	NO
4.03	5.49	2.28	3.21	5.49	5.90	5.50	0.0610	0.0000	18.79	.	NO
4.04	5.49	2.28	3.21	5.49	5.90	5.60	0.0457	0.0000	26.14	.	NO
4.05	5.49	2.28	3.21	5.49	5.90	5.60	0.0457	0.0000	26.14	.	NO
4.06	5.49	2.28	3.21	5.49	6.00	5.60	0.0610	0.0000	19.61	.	NO

If Baseline (B/L) Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness. Minimum Thickness is calculated

Design Minimum Thickness = Nom. Thick. - CA - Manufacturing Steel Tolerance.

Manufacturing Tolerance of pipe and forged fittings is + or -12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

(*) and GREEN Represent 25% of the last thickness readings, which have the shortest remaining half life.

BLUE (Caution TML Point) - if Corrosion Rate exceed a 0.250mm / 0.009 in. per yr. or Half Life is less than 15 years.

RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.

CA - Corrosion Allowance, CR - Corrosion Rate (Brown if CR >= 0.500mm or 0.019in/yr.).

Calculated T-Min. Thickness - Using UPipe Mathematics.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	DEETHANIZER OVERHEAD HEATER	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603HT004		
PROV. REG. #:	N/S	VESSEL CORROSION ALLOWANCE:	1.59 mm.
SERIAL #:	1625		
CRN.:	N8424.21	TOTAL CAUTION / ACTION TML:	9

Item # (025)

COMMENTS:

2014/10 - TML 06 AND 08 - AS PER TAQA NORTH PRESSURE PIPING PROCEDURE THE MINIMUM WALL REQUIRED IS 2.54MM FOR A 2" COMPONENT WITH 150# FLANGE RATING. BY WILL RETTMAN.

TML No.: 6 2"90L S-E

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 4.94 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 4.80 mm.

Pts.	Nom. Thick. mm.	CA + Steel Mfg.Tol. mm.	Nom. -CA -Toll. mm.	B/L Survey Thick. mm.	Prev. Survey Thick. mm.	Last Survey Thick. mm.	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm-yyyy mm.	Action/Caution Required Item
				01/1998	04/2008	10/2014					
6.01	5.54	3.00	2.54	5.54	4.90	5.00	0.0000	0.0330	37.25	.	NO
6.02	5.54	3.00	2.54	5.54	5.00	5.10	0.0000	0.0254	50.40	.	NO
6.03	5.54	3.00	2.54	5.54	5.00	5.00	0.0000	0.0330	37.25	.	NO
6.04	5.54	3.00	2.54	5.54	5.10	4.80	0.0457	0.0432	24.72	.	NO
6.05	5.54	3.00	2.54	5.54	5.20	4.80	0.0610	0.0432	18.54	.	NO

TML No.: 8 2"90L W-N

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 4.88 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 4.80 mm.

Pts.	Nom. Thick. mm.	CA + Steel Mfg.Tol. mm.	Nom. -CA -Toll. mm.	B/L Survey Thick. mm.	Prev. Survey Thick. mm.	Last Survey Thick. mm.	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm-yyyy mm.	Action/Caution Required Item
				01/1998	04/2008	10/2014					
8.01	5.54	3.00	2.54	5.54	5.00	4.90	0.0152	0.0381	30.97	.	NO
8.02	5.54	3.00	2.54	5.54	5.00	5.00	0.0000	0.0330	37.25	.	NO
8.03	5.54	3.00	2.54	5.54	5.00	4.80	0.0305	0.0432	26.17	.	NO
8.04	5.54	3.00	2.54	5.54	5.00	4.90	0.0152	0.0381	30.97	.	NO
8.05	5.54	3.00	2.54	5.54	5.00	4.80	0.0305	0.0432	26.17	.	NO

If Baseline (B/L) Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness. Minimum Thickness is calculated

Design Minimum Thickness = Nom. Thick. - CA - Manufacturing Steel Tolerance.

Manufacturing Tolerance of pipe and forged fittings is + or -12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

(*) and GREEN Represent 25% of the last thickness readings, which have the shortest remaining half life.

BLUE (Caution TML Point) - If Corrosion Rate exceed a 0.250mm / 0.009 in. per yr. or Half Life is less than 15 years.

RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.

CA - Corrosion Allowance, CR - Corrosion Rate (Brown if CR >= 0.500mm or 0.019in/yr.).

Calculated T-Min. Thickness - Using UPipe Mathematics.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	DEETHANIZER OVERHEAD HEATER	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603HT004		
PROV. REG. #:	N/S	VESSEL CORROSION ALLOWANCE:	1.59 mm.
SERIAL #:	1625		
CRN.:	N8424.21	TOTAL CAUTION / ACTION TML:	9

Item # (025)

COMMENTS:

2014/10 - TML 06 AND 08 - AS PER TAQA NORTH PRESSURE PIPING PROCEDURE THE MINIMUM WALL REQUIRED IS 2.54MM FOR A 2" COMPONENT WITH 150# FLANGE RATING. BY WILL RETTMAN.

TML No.: 10 4" BTM BAND S-N

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.57 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.50 mm.

Pts.	Nom. Thick. mm.	CA + Steel Mfg.Tol. mm.	Nom. -CA -Toll. mm.	B/L Survey Thick. mm.	Prev. Survey Thick. mm.	Last Survey Thick. mm.	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm-yyyymm.	Action/Caution Required Item
				01/1998	04/2008	10/2014					
10.01	5.49	2.28	3.21	5.49	6.10	5.60	0.0762	0.0000	15.68	.	NO
10.02	5.49	2.28	3.21	5.49	6.10	5.60	0.0762	0.0000	15.68	.	NO
10.03	5.49	2.28	3.21	5.49	5.80	5.50	0.0457	0.0000	25.05	.	NO
10.04	5.49	2.28	3.21	5.49	5.80	5.60	0.0305	0.0000	39.21	.	NO
10.05	5.49	2.28	3.21	5.49	5.70	5.50	0.0305	0.0000	37.57	.	NO
10.06	5.49	2.28	3.21	5.49	6.10	5.60	0.0762	0.0000	15.68	.	NO

TML No.: 12 2"90L T-B 150

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 3.76 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 3.70 mm.

Pts.	Nom. Thick. mm.	CA + Steel Mfg.Tol. mm.	Nom. -CA -Toll. mm.	B/L Survey Thick. mm.	Prev. Survey Thick. mm.	Last Survey Thick. mm.	Short Term CR mm/yr	Long Term CR mm/yr	Rem. Half Life yr	Future UT Reading mm-yyyymm.	Action/Caution Required Item
				01/1998	04/2008	10/2014					
12.01	3.91	0.49	3.42	3.91	4.30	3.90	0.0610	0.0000	3.94	.	CAUTION *
12.02	3.91	0.49	3.42	3.91	4.30	3.70	0.0914	0.0127	1.53	.	CAUTION *
12.03	3.91	0.49	3.42	3.91	4.20	3.70	0.0762	0.0127	1.84	.	CAUTION *
12.04	3.91	0.49	3.42	3.91	3.70	3.80	0.0000	0.0076	24.94	.	NO
12.05	3.91	0.49	3.42	3.91	3.70	3.70	0.0000	0.0127	11.03	.	CAUTION

If Baseline (B/L) Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness. Minimum Thickness is calculated

Design Minimum Thickness = Nom. Thick. - CA - Manufacturing Steel Tolerance.

Manufacturing Tolerance of pipe and forged fittings is + or -12.5% (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

Manufacturing Tolerance of plate is + or - 0.25mm (0.010") (May or may not apply dependent upon the Client's Owner-User Integrity Management System).

(*) and GREEN Represent 25% of the last thickness readings, which have the shortest remaining half life.

BLUE (Caution TML Point) - if Corrosion Rate exceed a 0.250mm / 0.009 in. per yr. or Half Life is less than 15 years.

RED (Action TML Point) - If Remaining Half Life is 0 and Last Survey Thickness is below Nominal-CA-Tolerance Thickness.

CA - Corrosion Allowance, CR - Corrosion Rate (Brown if CR >= 0.500mm or 0.019in/yr.).

Calculated T-Min. Thickness - Using UPipe Mathematics.

EQUIPMENT EXTERNAL INSPECTION REPORT

Customer:	TAQA North	ITS Job No.:	1-2968
District:	North Area	Date:	18-Oct-2014
Facility:	Chinchaga Gas Plant	LSD:	C-032-H/094-H-08
Equip. Description:	De-Ethanizer Overhead Heater	Serial No.:	1625
Equip./OIP No.:	603HT004	PRN:	Not Applicable
Equip. Type: <input type="checkbox"/> Column <input type="checkbox"/> Cooler <input checked="" type="checkbox"/> Exchanger <input type="checkbox"/> Furnace <input type="checkbox"/> Heater <input type="checkbox"/> Plate Exchanger <input type="checkbox"/> Reboiler <input type="checkbox"/> Vessel <input type="checkbox"/> Other:			

Remedial Action	Service	Associated Components	Shell
<input checked="" type="checkbox"/> No Action Required	<input checked="" type="checkbox"/> Sweet <input type="checkbox"/> Sour	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N: Name Plate Secure	<input checked="" type="checkbox"/> Good Condition
<input type="checkbox"/> Paint/Coating Repairs	Access and Coverage	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N: Name Plate Legible	<input type="checkbox"/> External Corrosion
<input type="checkbox"/> Insulation Repairs	<input checked="" type="checkbox"/> External Inspection	External Grounding	<input type="checkbox"/> Pitting: (max depth)
<input type="checkbox"/> PSV Service Required	<input type="checkbox"/> Part. External Inspection	<input type="checkbox"/> Direct <input checked="" type="checkbox"/> Indirect <input type="checkbox"/> N	<input type="checkbox"/> Scale
<input type="checkbox"/> Further Assessment Required	<input type="checkbox"/> Internal Inspection (VI) NDE Examination	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA: Ladders/ Handrail/ Walkway/ Grating in safe condition?	<input type="checkbox"/> Blistered
<input type="checkbox"/> Condition Damage	<input checked="" type="checkbox"/> UT		<input type="checkbox"/> Mechanical Damage
<input type="checkbox"/> Does not comply with applicable code/safe operating requirement.	<input type="checkbox"/> MT	<input type="checkbox"/> See Attached Pictures	<input type="checkbox"/> Deformation/Distortion
<input type="checkbox"/> Repairs Required	<input type="checkbox"/> PT	<input type="checkbox"/> Excessive Vibration	<input type="checkbox"/> Condensation/Sweating
<input type="checkbox"/> See Comments	<input type="checkbox"/> RT	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA: Pressure Gauge within MAWP	<input type="checkbox"/> No Access
	<input type="checkbox"/> BH		<input type="checkbox"/> No Access Insulated
Status	<input type="checkbox"/> Other	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA: Temp. Gauge within MDMT	<input checked="" type="checkbox"/> Weld(s) in Good Condition
<input checked="" type="checkbox"/> Operational; <input type="checkbox"/> Idle;	<input type="checkbox"/> See Comments	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N Attached Piping and Instrumentation in Good Condition	<input type="checkbox"/> Weld(s) Corroded
<input type="checkbox"/> Shut In;		<input type="checkbox"/> See Comments	<input type="checkbox"/> Weld(s) Poor Quality
<input type="checkbox"/> Surplus/Boneyard;			<input type="checkbox"/> Weld(s) Cracked
<input type="checkbox"/> Other:			<input type="checkbox"/> See Comments

Head (1)	Head (2)	Nozzles
<input type="checkbox"/> Top <input checked="" type="checkbox"/> North <input type="checkbox"/> West	<input type="checkbox"/> Bottom <input checked="" type="checkbox"/> South <input type="checkbox"/> East	<input checked="" type="checkbox"/> RF <input type="checkbox"/> RTJ <input type="checkbox"/> NPT
<input type="checkbox"/> Flat <input checked="" type="checkbox"/> FLG <input type="checkbox"/> ELL <input type="checkbox"/> ECC <input type="checkbox"/> HEMI	<input type="checkbox"/> Flat <input type="checkbox"/> FLG <input type="checkbox"/> ELL <input type="checkbox"/> ECC <input type="checkbox"/> HEMI	<input checked="" type="checkbox"/> Good Condition
<input type="checkbox"/> Quick Actuating Closure	<input type="checkbox"/> Quick Actuating Closure	<input checked="" type="checkbox"/> Fasteners Engaged
<input checked="" type="checkbox"/> Good Condition	<input type="checkbox"/> Good Condition	<input type="checkbox"/> Repad Weep Holes Clear
<input type="checkbox"/> External Corrosion	<input checked="" type="checkbox"/> External Corrosion	<input type="checkbox"/> Nozzles are Gusseted
<input type="checkbox"/> Pitting: (max depth)	<input type="checkbox"/> Pitting: (max depth)	<input type="checkbox"/> External Corrosion
<input type="checkbox"/> Scale	<input type="checkbox"/> Scale	<input type="checkbox"/> Leaking/Weeping
<input type="checkbox"/> Blistered	<input type="checkbox"/> Blistered	<input type="checkbox"/> Damaged/Cracked
<input type="checkbox"/> Mechanical Damage	<input type="checkbox"/> Mechanical Damage	<input type="checkbox"/> Bolts Missing/Loose
<input type="checkbox"/> Deformation/Distortion	<input type="checkbox"/> Deformation/Distortion	<input type="checkbox"/> Deflection/Distortion
<input type="checkbox"/> Condensation/Sweating	<input type="checkbox"/> Condensation/Sweating	<input type="checkbox"/> Partial Internal Inspection
<input type="checkbox"/> No Access	<input type="checkbox"/> No Access	<input type="checkbox"/> No Access Insulated
<input type="checkbox"/> No Access Insulated	<input type="checkbox"/> No Access Insulated	<input checked="" type="checkbox"/> Weld(s) in Good Condition
<input type="checkbox"/> No Access Ice Build Up	<input type="checkbox"/> No Access Ice Build Up	<input type="checkbox"/> Weld(s) Corroded
<input type="checkbox"/> External Protection Only	<input type="checkbox"/> External Protection Only	<input type="checkbox"/> Weld(s) Poor Quality
<input type="checkbox"/> See Comments	<input checked="" type="checkbox"/> See Comments	<input type="checkbox"/> Weld(s) Cracked
		<input type="checkbox"/> See Comments

External Surface	Supports	Associated Piping	PRD 1	PRD 2
<input checked="" type="checkbox"/> Good Condition	<input type="checkbox"/> Good Condition	<input checked="" type="checkbox"/> Good Condition	Location: Above vessel 603VS013	Location: West on 603VT001
<input checked="" type="checkbox"/> Painted <input checked="" type="checkbox"/> Full <input type="checkbox"/> Part.	<input checked="" type="checkbox"/> Anchor Bolts Secure	<input type="checkbox"/> Corrosion	PSV Tag No.: 603SVVS013	PSV Tag No.: 603SVVT001
<input type="checkbox"/> Coated <input type="checkbox"/> Full <input type="checkbox"/> Part.	<input type="checkbox"/> Welded to Skid	<input type="checkbox"/> Pitting: (max depth)	<input checked="" type="checkbox"/> Service Date within Interval	<input checked="" type="checkbox"/> Service Date within Interval
<input type="checkbox"/> Insulated <input type="checkbox"/> Full <input type="checkbox"/> Part.	<input type="checkbox"/> Supported by Nozzle(s)	<input type="checkbox"/> Bolts Missing/ Loose/ Damaged	<input checked="" type="checkbox"/> Set Pressure within MAWP	<input checked="" type="checkbox"/> Set Pressure within MAWP
<input type="checkbox"/> Insulation Damaged	<input type="checkbox"/> Piping Supported	<input type="checkbox"/> Short Threaded	<input checked="" type="checkbox"/> Safety Seal Intact	<input checked="" type="checkbox"/> Safety Seal Intact
<input type="checkbox"/> Penetration Seals Broken	<input type="checkbox"/> Expansion Slots	<input type="checkbox"/> Valves leaking	<input checked="" type="checkbox"/> Service Seal Intact	<input checked="" type="checkbox"/> Service Seal Intact
<input type="checkbox"/> Corrosion Under Insulation (CUI)	<input type="checkbox"/> Bolts Missing/ Loose/ Damaged	<input type="checkbox"/> Connections Leaking	<input checked="" type="checkbox"/> Current Service Tag Attached	<input checked="" type="checkbox"/> Current Service Tag Attached
<input type="checkbox"/> Visible Moisture Contamination	<input type="checkbox"/> Short Threaded	<input checked="" type="checkbox"/> Piping and Valves Supported	<input type="checkbox"/> PSV inlet Gusseted	<input type="checkbox"/> PSV inlet Gusseted
<input type="checkbox"/> Paint Deterioration	<input type="checkbox"/> Deflected/Distorted	<input type="checkbox"/> Piping Deflected/ Distorted	<input type="checkbox"/> Inlet Block Valve	<input type="checkbox"/> Inlet Block Valve
<input type="checkbox"/> Coating Deterioration	<input type="checkbox"/> Poor Insulation	<input type="checkbox"/> No Access Insulated	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Fireproofing Cracked	<input type="checkbox"/> Fire Proofing Cracked	<input type="checkbox"/> See Comments	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> External Protection Only	<input checked="" type="checkbox"/> Vessel is level		<input type="checkbox"/> Outlet Block Valve	<input type="checkbox"/> Outlet Block Valve
<input type="checkbox"/> See Comments	<input type="checkbox"/> See Comments		Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N
			Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N
			<input checked="" type="checkbox"/> See Comments	<input checked="" type="checkbox"/> See Comments

Observations:
Equipment in ☒ **Good**, ☐ **Fair**, ☐ **Poor Condition**
Good: No concerns found (may still have recommendations)

Fair: Minor issues found that do not impair the "fitness for service" of the equipment, (paint deterioration, general external surface corrosion - no measurable metal loss, not mounted to skid, etc.)

Poor: Equipment had moderate to major concerns found (equipment is damaged, severe external corrosion noted, cracked or broken component, etc.)

☐ **Based on API 510 Visual External Inspection this vessel is fit for service**
(this piece of equipment meets the Jurisdictional requirements)

PSV 1 is the tube side PSV. PSV 2 is the tube side PSV.

South head is a 2" U-bend.

Paint deterioration on the south U-bend has led to minor exterior corrosion in that area.

Recommendations:

None

Non-Conformance Conditions and Corrective Actions:

Note: Reference any and all Non-Conformance Report (NCR) numbers and Corrective Action Report (CAR) numbers.

None

Recommended Inspection Intervals:

Recommended Maximum Inspection Interval:	60	Months	PRD 1 Recommended Service Interval:	60	Months	PRD 2 Recommended Service Interval:	60	Months
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External Inspection Performed By:

Print Name:

Murray Angus MacGregor

Certification No.:

ABSA IPV PESL: 000622

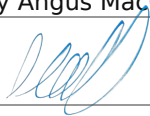
API 510: 40801

API 653: 48515

PEI Class 2: 158

CWB Level 2: 8501

Signature:



Report Reviewed:


Initial

Chief Inspector /
Client
Representative:

Name (Print)

Signature

Date: