

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS ① 615957
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by EXCHANGER INDUSTRIES LIMITED 5505 - 52 Street S.E., Calgary, AB T2C 2W8
(Name and address of Manufacturer)

2. Manufactured for GRB Engineering Ltd., 1000, 707 - 7th Avenue, S.W., Calgary, AB T2P 3H6
(Name and address of Purchaser)

3. Location of installation Cenovus Energy, Pelican Lake SAGD - GRB Project #172, Pelican Lake, AB LSD# 12-7-82-22-W4
(Name and address)

4. Type Horizontal Heat Exchanger 11-3025
(Horiz., vert., or sphere) (Tank, separator, jkt. vessel, heat exh., etc.) (Mfg's serial No.)

V2159.2 10-3155A/B Rev.2 - 2012
(CRN) (Drawing No.) (Nat'l. Bd No.) (Year Built)

5. ASME Code, Section VIII, Div. 1 2010 - -
Edition and Addenda (date) Code Case No. Special Service per UG-120(d)

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multi-chamber vessels.

6. Shell (a) No. of Course(s): 1 (b) Overall length (ft & in.): 22' - 5 1/2"

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	16" OD	22' - 5 1/2"	SA333-6		1.219"	1/8"	S	-	1.0	1	Full	1.0	1150°F	1.5 Hrs.

7. Heads: (a) SA516-70N 1.5 Hrs. @ 1150°F
(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)														
(b)	End	1.125"				2:1					X			

If removable, bolts used (describe other fastening)

8. Type of jacket
(Mat'l Spec. No., Grade, size, No.) Jacket closure

If bar, give dimensions

(Describe as ogee & weld, bar, etc)

If bolted, describe or sketch.

9. MAWP 1860 - psi at max. temp. 428 - °F Min. design metal temp. -20 °F at 1860 psi.
(internal) (external) (internal) (external)

10. Impact test No, all shell material exempt per UG-20(f)(1-5) & UCS-66(g). at test temperature of N/A °F.

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

11. Hydro., pneu., or comb. test press. 2418 psi Proof test -

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA516-70N 13.562" 3.9375" 3/16" Bolted
Stationary (Mat'l Spec. No.) Dia., in. (subject to press.) Nom. thk. in. Corr. Allow., in. Attachment (welded or bolted)

Floating (Mat'l Spec. No.) SA 179 3/4" 12 BWG M/W 39 U*
Dia., in. Nom. thk., in. Corr. Allow., in. Attachment

13. Tubes: SA 179 3/4" 12 BWG M/W 39 U*
Mat'l Spec. No., Grade or Type O.D., in. Nom. thk., in. or gauge Number Type (Straight or U)

Items 14-18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell (a) No. of course(s) 1 (b) Overall length (ft & in.): 1' - 7/8"

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	16" OD	1' - 7/8"	SA333-6		1.219"	1/16"	S	-	1.0	1	Full	1.0	1150°F	1.5 Hrs.

15. Heads: (a) SA516-70N (b)
(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)	End	1.125"	1/16"			2:1					X			
(b)														

If removable, bolts used (describe other fastening).

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

① 615 957

18. Hydro., pneu., or comb. test press. **2418 psi** Proof test

19. Nozzles, inspection, and safety valve openings:

[illegible]

20. Supports:	Skirt	No (Yes/no)	Lugs	N/A (No.)	Legs	N/A (No.)	Other	Saddles (Describe)	Attached	Welded to Shell (Where and how)
---------------	-------	-----------------------	------	---------------------	------	---------------------	-------	------------------------------	----------	---

21. 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)

22. Remarks: * U-Bends stress relieved @ 1150°F for 1 Hr.

SAFETY VALVES:	P.S.V. on piping per UG-125 (g) to be installed by owner	CUBIC CAPACITY:	23.23 cu.ft.
SURFACE AREA:	346.7 sq.ft.	MK1 / MK2 Studs:	SA193-B7M, 1 5/8" x 15" lg. (16 pcs.), Nuts: SA194-2HM UNC (32 pcs.)
SERVICE:	BFW / Blowdown Exchanger	MK1 / MK2:	24" OD x 13 9/16" ID x 3 11/16" / 3 13/16" thk.
ITEM #:	E-200C	Constructed to Drawing #11-3025 Rev.1	

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 BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization Number. 5983 Expires March 30, 2014

Date Jan 31, 2012 Name Exchanger Industries Limited Signed Darrelle J. Henderson
(Manufacturer) (Representative)

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of ALBERTA and employed by ABSA of CALGARY, ALBERTA have inspected the pressure vessel described in this Manufacturer's Data Report on Jan. 31, 2012, and state that, to the best of my knowledge and belief, the

Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report.

Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this

Inspection. JAN 31 2012 Signed [Signature] Commissions AB 249 NB 12900 A
Date (Authorized Inspector) (Nat'l Board incl. endorsements, State, Prov. and

We certify that the statements in this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization Number _____ Expires _____, 20____

Date _____ Name _____ (Assembler) Signed _____ (Representative)

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of _____ and employed by _____ of _____

have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items _____ not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of _____. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date _____ Signed _____ Commissions _____
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)