



**CHRISTINA LAKE REGIONAL PROJECT
Phase 3A EPC for Central Plant Facilities**



SLI Project No. 511036

 SNC-LAVALIN	<input type="checkbox"/> A1 Not suitable to initiate fabrication. modify as noted, resubmit for review.
	<input type="checkbox"/> B1 Suitable to initiate fabrication as noted. modify as noted, resubmit for review.
Vendor's drawing review for conformity with specifications and design drawing.	<input type="checkbox"/> C1 Suitable to fabricate to completion as noted. submit final documents including as-builts as required.
This review does not relieve the vendor of his responsibility for errors in design and detailing as detailed in his contract.	<input type="checkbox"/> D1 Suitable to fabricate to completion. submit final documents including as-built documents as required.
	<input type="checkbox"/> E1 Not suitable as final documents as noted. modify as noted and resubmit.
<input checked="" type="checkbox"/> F1 Suitable as final documents. no further resubmittal required (unless revised by vendor).	
Vendor: Heat Exchanger Design, Inc. - 12427	No.: TSS4565A (Case 1)
Doc. Title: D00.01 - Thermal Data Sheet - Tag: 3A-E-144	Rev: 1
Client Code:	Project: MEG Phase 3A EPC
Reviewed by: <i>Aus de</i>	Document No.
Date: <i>Nov 13, 2013</i>	P-5330-01-0011
	Date Rec'd 2013/10/30
	Submittal 03

Heat Exchanger Design, Inc.



P.O.Box 524
Indianapolis, IN., 46205

Tel:(317)686-9000
Fax:(317)686-9100

HEAT EXCHANGER SPECIFICATION SHEET										Page 1
Customer					MEG Energy Corp.		Job No.		4565A	
Address							Reference No.		PO# P-5330-01	
Plant Location					Christina Lake, AB		Proposal No.		111-13	
Service of Unit					DILUENT RECOVERY / GLYCOL EXCHANGER		Date		8/19/2013 Rev 3	
Size					460 x 19 x 7620mm Type SH18B230-25-02-SS-6B8A		Item No.		3A-E-144 (Maximum Duty Case)	
Surf/Unit (Gross/Eff)					448.14 / 446.74 m2		Shell/Unit		2	
							Surf/Shell (Gross/Eff)		224.07 / 223.37 m2	
PERFORMANCE OF ONE UNIT										
Fluid Allocation			Shell Side				Tube Side			
Fluid Name			TEG / H2O (60/40 wt%)				Diluent Vapour			
Fluid Quantity, Total			kg/hr		45843.2				15170.4	
Vapor (In/Out)							15169.9		223.005	
Liquid			45843.2		45843.2		0.4693		14947.4	
Steam										
Water										
Noncondensables										
Temperature (In/Out)			C		40.00 110.90		126.10		50.00	
Specific Gravity			1.0789		1.0215		0.9339		0.6429	
Viscosity			mN-s/m2		4.6610		1.2490		0.0102 V/L 0.2361 0.0108 V/L 0.2685	
Molecular Weight, Vapor										
Molecular Weight, Noncondensables										
Specific Heat			kJ/kg-C		3.2230		3.4760		2.1119 V/L 4.443 1.9170 V/L 2.580	
Thermal Conductivity			W/m-C		0.3276		0.3400		0.0248 V/L 0.686 0.0262 V/L 0.113	
Latent Heat			kJ/kg				2147.35		373.794	
Inlet Pressure			kPa		994.002		534.000			
Velocity			m/s		0.31		5.10			
Pressure Drop, Allow/Calc			kPa		70.000 46.079		75.000		19.858	
Fouling Resistance (min)			m2-K/W		0.000180		0.000350			
Heat Exchanged			MegaWatts		3.0597		MTD (Corrected)		15.6 C	
Transfer Rate, Service			437.93 W/m2-K		Clean		703.47 W/m2-K		Actual 487.95 W/m2-K	
CONSTRUCTION OF ONE SHELL										
			Shell Side				Tube Side			
Design/Test Pressure			kPaG		1500/FV / Code		1155/FV / Code		Sketch (Bundle/Nozzle Orientation)	
Design Temperature			C		-28.9 / 178		-28.9 / 178			
No Passes per Shell			1		1					
Corrosion Allowance			mm		3.2		6.4 (CS components)			
Connections			In inch		6" 300# RFWN		8" 150# RFWN			
Size & Rating			Out inch		6" 300# RFWN		8" 150# RFWN			
			Intermediate							
Tube No.			230		OD 19.050 mm		Thk(Avg) 1.651 mm		Length 7.620 m	
Tube Type			Plain				Material		SA-213-316L	
Shell			SA-106 B		457.2mm OD		Shell Cover		SA-516-70N	
Channel or Bonnet			SA-240-316L (Note 6)				Channel Cover		N/A	
Tubesheet-Stationary			SA-240-316L				Tubesheet-Floating		N/A	
Floating Head Cover			N/A				Impingement Plate		None	
Baffles-Cross			SS304		Type SINGLE-SEG. (Vert.)		%Cut (Diam) 36.00		Spacing(c/c) 304.801	
Baffles-Long			N/A				Seal Type			
Supports-Tube			SS304				U-Bend		Type	
Bypass Seal Arrangement							Tube-Tubesheet Joint		Seal Welded & Expanded (two grooves)	
Expansion Joint							Type			
Rho-V2-Inlet Nozzle			kg/m-s2				Bundle Entrance		Bundle Exit kg/m-s2	
Gaskets-Shell Side			Kammpro Type				Tube Side		Kammpro Type	
-Floating Head			N/A							
Code Requirements			ASME Section VIII, Div. I				TEMA Class			
Weight/Shell			5760.4		Filled with Water 7950.25		Bundle 2889.14		kg	
Remarks: 1. This is HED's standard separated head Hairpin Exchanger with independent bolting. 2. 50mm thick mineral wool insulation is included. 3. Glycol heat tracing for 10°C hold temperature is included. 4. 10% overdesign in surface has been provided. 5. Tube-to-tubesheet welding procedures shall be qualified and tested in accordance with ASME Section IX, QW-193. 6. Tubeside is in sour service, and 100% RT and NACE materials are required. 7. Channel changed to 316L SS to avoid PWHT requirements. 8. U-bends are solution annealed.										
Reprinted with Permission (v6 SP3)										