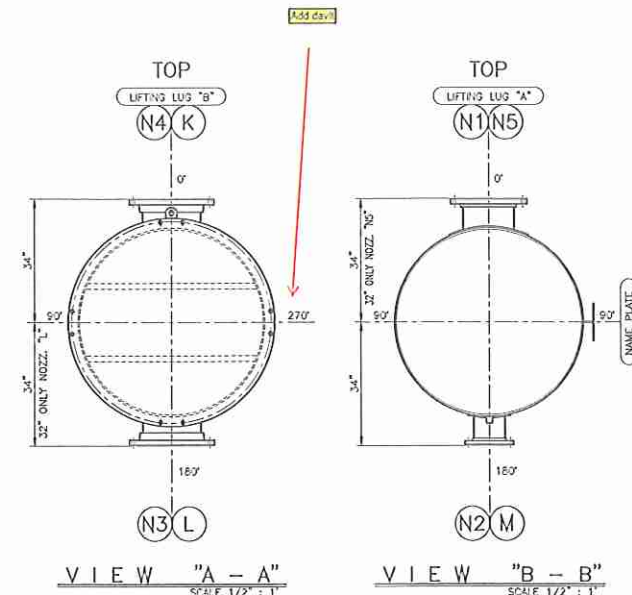


B	RENOVA COMMENTS ADDED	EMSV.	TRANA	18/0
A	FOR APPROVAL	EMSV.	TRANA	10/0
No.	DESCRIPTION	DRAN	CHECK	DA
R E V I E W				

[illegible]

TITLE: GENERAL ARRANGEMENT & DETAILS					
DRAWN: E.M.S.V.		CHECKED: A. TRIANA	APPROVED: M.S.M.	DATE: 10/MAR/07	DRAWING No: MDI-333-8-1
SCALE: AS SHOWN		UNITS: INCHES	WORK ORDER: MDI-333-8		REV: B

DESIGN DATA			
	SHELL SIDE		TUBES SIDE
FLUID		HEATED COOLING WATER	WATER
DESIGN PRESSURE	Pa _d	100	100
DESIGN TEMPERATURE	T _d	250	250
OPERATING PRESSURE	Pa _o	-	-
OPERATING TEMPERATURE (IN/OUT)	T _o	70 / 82	91 / 68
HYDROSTATIC TEST PRESSURE	P _h	150	150
WU/MU DESIGN METAL TEMPERATURE (WU/MU)	P _o OR P _h	-20 OR 100	-20 OR 100
WU/MU ALLOWABLE WORKING PRESSURE (WU/MU)	P _o OR P _h	100 OR 250	100 OR 250
AT FOR NICKEL DESIGN			212
CORROSION ALLOWANCE	IN	1/16"	0.0"
NO. OF PASSES		1	2
JOINT EFFICIENCY	E	0.85	0.85
RADIOGRAPH	RT-3	RT-3 (SPOT)	RT-3 (SPOT)
POST WELD HEAT TREATMENT	PR-2 & RS-5H	NO	NO
IMPACT TEST	PR-2 & RS-5H	NO	NO
CUT BUFFLE	%	25	
NO. OF TUBING / DIA. / LGTH. / BWG		318 TUBES 1 1/2" O.D. x 30' LGTH. 16 BWG (1.645" ID 1.75" O.D.)	
TUBE TO TUBESHEET JOINT (SEE NOTE 18)		EXPANDED W/TWO GROOVES AND SEAL RING	
SIZE		1N 1" # 305 LGTH	
TYPE / CLASS TEMA		HEX HORIZONTAL	"B"
SURFACE (PER SHELL)	FIN ₂	3745	
TOTAL VOLUME	FIN ₃	300	
EMPTY WEIGHT	lbs ₃	23,750	
FULL WATER WEIGHT	lbs ₃	42,450	
BUNDLE WEIGHT	lbs ₃	11,500	
PACKING WEIGHT	lbs ₃	23,750	

MATERIALS SPECIFICATION	
SHELL	SA-516-70
SHIELD COVER	NO
CHANNEL	SA-240-304
CHANNEL COVER (FLAT COVER)	SA-516-70 w/ LNER SA-240-304
TUBESHEET	SA-240-304
TUBING	SA-249-TP 304 (WELDED)
TIE ROD	SA-35 or ANSI-1018
SPACERS	SA-53-B
BAFFLES	SA-36 or EQUIVALENT
INSTRUMENT PLATE	SA-516-70
PASS PARTITION PLATE (SEE NOTE 7)	SA-240-304
MAN FLANGES (SHELL SIDE/CH. SIDE)	- / SA-105
NOZZLES FLANGES (SHELL SIDE/CH. SIDE)	SA-105 / SA-105
NOZZLES NECK (SHELL SIDE/CH. SIDE)	SA-105-B / SA-312-TP 304 (W)
NOZZLES (SHELL SIDE/CH. SIDE)	1/2" TH. 304 NON AESTHETIC
SADDLE SUPPORT (PAD / SUPT)	SA-240-304 / SA-35
LIFTING LUGS (PAD / LUG)	SA-516-70 / SA-516-70
EXPANSION JOINT	SA-240-304
EARTH LUG	SA-240-304
PAINTING	SEE NOTE No. 26
INSULATION	---
INTERNAL NUTS	SA-194-2H
EXTERNAL STUD BOLT	SA-193-97
EXTERNAL NUTS	SA-194-2H

NON DESTRUCTIVE TESTING	YES	NO	NOTES
RADIOGRAPH	X		SEE DESIGN DATA
MAGNETIC PARTICLE EXAMINATION	X		SEE NOTE 15
ULTRASONIC EXAMINATION		X	
LIQUID PENETRANT EXAMINATION	X		NOZZLE - GILL JOINT (NOTE 15)

WELDING NOMENCLATURE	
GMW	GAS METAL ARC WELDING
GTW	GAS TUNGSTEN ARC WELDING
SWW	SHIELDED METAL ARC WELDING
SAW	SUBMERGED ARC WELDING
FCW	FLUX CORED ARC WELDING

GENERAL NOTES:

- 1.- EQUIPMENT FABRICATION AND ACCEPTANCE SUBJECT TO INSPECTION BY: RENOVA ENERGY IDMO, INC.
- 2.- SEE OTHER FABRICATION DRAWING
- WDI-333-8-2 CONSTRUCTION VIEW & NOZZLES DETAILS
- WDI-333-8-3 TUBE BUNDLE & DETAILS
- WDI-333-8-4 NAME PLATE
- DESIGN NOTES:**
- 3.- FABRICATION PER ASME CODE SECTION VII DIV. 1, 2004 ED. & 2006 ADD. AND TEMA (B) 1959 ED.
- 4.- MATERIALS ACCORDING TO ASME SECTION II, PART 2.
- 5.- NOZZLES FLANGE (2" & 24" NOM. DIA.) TO BE ACCORDING WITH ASME STD. B16.5
- 6.- EQUIPMENT WILL BE CODE STAMPED (ASSE "U") & NATIONAL BOARD (NSF) REGISTERED
- 7.- THE PASS PARTITION PLATE TO BE DESIGN TO WITHSTAND 100 PSIA

DESIGN NOTES:

- 3- FABRICATION PER ASME CODE SECTION VII, DIV. 1, 2004 ED. & 2008 ADD. AND TEMA (B) 1959 ED.
 - 4- MATERIALS ACCORDING TO ASME SECTION II, PART 14.
 - 5- NOZZLES FLANGE < 24" NOM. DIAM. TO BE ACCORDING WITH ASME STD. B16.5.
 - 6- EQUIPMENT WILL CODE STAMPED (ASSE "U") AND NATIONAL BOARD (NB) REGISTER
 - 7- THE PASS PARTITION PLATE TO BE DESIGN TO WITHSTAND 100 PSIA @
- ### FABRICATION NOTES:
- 8- (1) ONE EQUIPMENT SHALL BE FABRICATED.
 - 9- ALL FLANGE BOLT HOLES TO STRADDLE EQUIPMENT CENTER LINES
 - 10- ALL MACHINED SURFACES AND THREADED CONNECTIONS SHALL BE PROTECTED WITH A RUST PREVENTIVE.
 - 11- SURFACE FINISH AT GASKET SEAT AREA OF FLANGES SHALL BE 125 RMS ALL OTHER SURFACE SHALL BE 250 RMS
 - 12- NOZZLES SHALL NOT PAD ON WELD SEAM, EXCEPT PER UN-14(b)
 - 13- ALL REINFORCING PADS JOINING SHALL BE PNEUMATIC TESTED TO 10 PSIA TO 15 PSIA AND WITH AN ANGLE AFTER TESTING.
 - 14- ALL ATTACHMENTS TO VESSEL WALL, SHALL BE THE SAME MATERIALS
 - 15- P.T. or M.T. ON WELDS WHERE R.T. ARE NOT POSSIBLE
 - 16- ALL NOZZLES SHALL BE WELD WITH INSIDE OF VESSEL EXCEPT WHERE OTHER WISE ARE NOTED
 - 17- ALL INTERNAL WELDS TO BE GROUND SMOOTH TUBESHEET

FABRICATION NOTES:

- 8. (1) ONE EQUIPMENT SHALL BE FABRICATED.
- 9. - ALL FLANGE BOLT HOLES TO STRADDLE EQUIPMENT CENTER LINES
- 10. - ALL WELDED SURFACES AND THROUGH CONNECTIONS SHALL BE PROTECTED WITH RUST PREVENTIVE
- 11. - SURFACE FINISH AT GASKET SEAT AREA OF FLANGES SHALL BE 125 RMS ALL OTHER SURFACES SHALL BE 250 RMS
- 12. - ALL WELDS SHALL NOT FALL ON WELD SEAM, EXCEPT PER UW-14(b)
- 13. - ALL REINFORCING PLATE JOINTS, SHALL BE PNEUMATIC TEST TO 10 M.P.S. TO 15 P.S.I. AND PLUGGED WITH WELD AFTER TEST
- 14. - ALL ATTACHMENTS VENTILATION SHALL BE THE SAME MATERIALS
- 15. - P.T. OF M.T. ON WELDS WHERE R.T. ARE NOT POSSIBLE
- 16. - ALL NOZZLES SHALL BE FLUSH WITH INSIDE OF VESSEL EXCEPT WHERE OTHER USE
- 17. - ALL INTERNAL WELDS TO BE GROUND SMOOTH TUBESHEET

GENERAL ARRANGEMENT & DETAILS