CAUTION

THE PRESSURE AND TEMPERATURES SHOWN ON THE S.H.E. NAMEPLATE RELATE ONLY TO THE PRESSURE RETENTION CAPABILITY OF THIS HEAT EXCHANGER. COMPONENTS OF THIS HEAT EXCHANGER HAVE BEEN DESIGNED FOR SPECIFIC OPERATING CONDITIONS. A CHANGE IN SERVICE OR DEVIATION FROM THE SPECIFIED OPERATING CONDITIONS REQUIRES THAT A MECHANICAL DESIGN CHECK BE MADE IN ORDER TO AVOID POSSIBLE DAMAGE TO THE HEAT EXCHANGER.

NOTES

1. EST. WT. EMPTY: 29,100# | FULL: 50,400# | BDL: --
2. ALL BOLT HOLES STRADDLE NORMAL CENTERLINES.
3. SEAL ALL OPEN NOZZLES WITH BLIND FLANGES. PROVIDE EACH WITH A SERVICE GASKET AND A FULL ACCOMPANY OF STUDS AND NUTS.
4. 1/32" MAIN GASKET SURFACES.
5. PAINT: SANDBLAST O.S. PER SSPC-SP-6 (COMMERCIAL BLAST) C.ST'L ONLY. APPLY (1) COAT SHOP PRIMER.
6. 100% X-RAY ROLLED NOZZLE NECKS.
7. TUBE WALL REDUCTION SHALL BE CHECKED AND DOCUMENTED FOR THE FIRST FIVE TUBES AND FOLLOWED BY A RANDOM CHECK AND DOCUMENTATION OF 10% OF THE TOTAL TUBE COUNT.
8. ALL REINFORCING PADS SHALL BE AIR AND SOAP TESTED AT 15 PSIG PRIOR TO PWHT OR HYDRO. TEST.
9. PMI REQUIRED ON ALL ALLOY MATERIAL.
10. UT TEST TUBESHEETS AFTER FORMING BUT PRIOR TO DRILLING.
11. COAT ALL EXPOSED GASKET SURFACES WITH RUST BAN 326.
12. PAINT CUSTOMER PURCHASE ORDER NUMBER AND EQUIPMENT NUMBER ON THE SHELL IN 3" HIGH LETTERS AND WITH HIGHLY VISIBLE PAINT.
13. COAT ALL STUDS WITH FEL-PRO C-102 OR JET LUB SS-30. DO NOT GET COMPOUND ON THE GASKET SURFACES.
14. LOCAL POSTWELD HEAT TREAT 430 STAINLESS STEEL MATERIAL (TUBE TO TUBESHEET JOINT) AT A MINIMUM OF 1550° F FOR A MINIMUM OF (1) HOUR PER UHA-32. CLEARLY MARK ON SIDE OF THE CHANNEL IN 2" LETTERS "HEAT TREATED -- DO NOT WELD" IN A MINIMUM OF (2) LOCATIONS 180° APART.
15. DELETED. ⚠
16. PACKAGE AND LABEL ALL SPARE PARTS AND GASKETS WITH THE CUSTOMERS PURCHASE ORDER NUMBER AND EQUIPMENT NUMBER.
17. MAXIMUM TEMPERATURE FOR TUBE SIDE IS INLET= 1100T, OUTLET= 525T, TUBES AND TUBESHEET= 900T.
18. ALL P1-P1 WELDS ON SHELL SIDE WILL BE SPOT RADIOGRAPHY PER CODE. ALL OTHER WELD TYPES WILL BE FULL RADIOGRAPHY PER CODE.
19. ALL P7-P8(FCAW ONLY) WELDS AND HEAT AFFECTED ZONES SHALL HAVE A HARDNESS TEST COMPLETED. ACCEPTABLE HARDNESS FOR BOTH WELDS AND HEAT AFFECTED ZONES IS 225 OR LOWER ON THE BRINELL SCALE.

NON-PRESSURE PARTS

SUPPORTS / PADS	SA-36/SA-516 GR. 70
BAFFLES / SUPPORTS	SA-36
BRACKET A	SA-36
BUNDLE RAILS/CLIPS	SA-36
NOZZLE 0 END CAP	SA-36
NOZZLE Y2 SEAL CUP	SA-36
NAMEPLATE BRACKET	SA-240 304
GROUND LUG	SA-240 304
BACKING STRIP	SA-36

U
W
SS-RT4
TS-RT1
PHT

NATIONAL BOARD NO. REQ'D

CERTIFIED BY

SOUTHERN HEAT EXCHANGER CORP.

TUSCALOOSA, ALABAMA

SHELL SIDE
MAWP 305 PSI AT 650/450 °F.
MDMT 20 °F AT 305 PSI
TUBE SIDE
MAWP 160 PSI AT ++/450 °F.
MDMT 20 °F AT 160 PSI

SHECO SER. NO. 03-407 YEAR 2005
CUST. ORDER 45087373
CUST. ITEM EN 601-1015-1
++ (INLET- 1100T)(OUTLET- 525T)(TUBES & TUBESHEET- 900T)

ANSI NOZZLE SCHEDULE

	SIZE	RATE	FACE	NOZZLE NECK	SERVICE
				TUBE SIDE	
N	24"	--	SPLC.	--	PROCESS GAS INLET
L	48"	--	SPLC.	--	PROCESS GAS OUTLET
R1	¾"	3000#	THD.	FULL CPLG. PLUGGED	DRAIN
S1	¾"	3000#	THD.	FULL CPLG. PLUGGED	VENT
T1	½"	3000#	THD.	FULL CPLG. PLUGGED	MISC.
R2	¾"	3000#	THD.	FULL CPLG. PLUGGED	DRAIN
S2	¾"	3000#	THD.	FULL CPLG. PLUGGED	VENT
T2	½"	3000#	THD.	FULL CPLG. PLUGGED	MISC.
				SHELL SIDE	
Y	12"	300#	RFSO	X-STG.	STEAM OUTLET
Y1	12"	300#	RFSO	X-STG.	STEAM OUTLET
Y2	4"	300#	RFSO	X-STG.	WATER INLET
Y3	10"	300#	RFSO	X-STG.	WATER INLET
▲0	1 ½"	300#	RFSO	SCH. 160	INLET
P	1 ½"	300#	RFSO	SCH. 160	DRAIN
• H	6"	300#	STUDDING OUTLET		INSPECTION
• Z	8"	300#	STUDDING OUTLET		INSPECTION

• PROVIDE WITH BLIND FLANGE, STUDS, NUTS, & SERVICE GASKET. (PROVIDE WITH ONE SPARE GASKET)
▲ SEE NOZZLE DETAIL SHEET 7 OF 7.

WPS P1-P1	W-42(SMAW) W-72(FCAW) W-89(SAW) W-96(GTAW)
WPS P1-P8	W-2(SMAW) W-112(FCAW) W-100(SAW)
WPS P8-P8	W-3(SMAW) W-81(FCAW) W-90(SAW) W-97(GTAW)
WPS P7-P8 (19)	W-293(GTAW)

ASME CODE REQUIREMENTS

	SHELL SIDE	TUBE SIDE
DESIGN PRESSURE PSIG	305	160
DESIGN TEMPERATURE (MAX/VAC/MIN) °F	650/450/20	(17)/450/20
HYDRO. TEST PRESSURE (HOLD 1 HOUR) PSIG	400	230
CORROSION ALLOWANCE (C.S.T'L ONLY)	1/16"	NONE
POSTWELD HEAT TREATMENT	NO	YES
RADIOGRAPHIC EXAMINATION	SPOT/FULL (18)	FULL
METAL TEMP. (TEMA 8th ED.) °F		

ASME CODE STAMP / NAT'L BD. REG IS REQUIRED.
CUSTOMER INSPECTION IS REQUIRED
SPECIFICATIONS: 2001 ASME CODE SECT. VIII DIV. 1, ADDENDA A03
SPECIAL SERVICE: NONE CODE CASE: NONE PARTIAL DATA REPORTS: NONE
TEMA (B) EXEMPT FROM IMPACT TESTING PER: UCS-66(a)(b), UHA-51

TUBES: SA-268 430 (WLD)(9)(15) WALL: AVG
NO. 514 O.D. 1 ¼" BWG. 14 LENGTH: 25'-11 7/8"
TUBESHEETS: SA-240 321 (9)(10)

PART	SHELL SIDE (15)(9)	TUBE SIDE (9)
VESSEL	SA-516 GR. 70/ SA-240 321	SA-240 321
COVERS (TEST)		SA-516 GR. 70
FORMED HEADS		SA-240 321
BODY FLANGES		SA-182 F 321
NOZZLE FLANGES	SA-105	
COUPLINGS/COUPLETS		SA-182 F 321
NOZZLE PIPE	SA-106 GR. B	SA-240 321
NOZZLE REINF. PADS	SA-516 GR. 70	
STUDS/NUTS	SA-193-B7/SA-194-2H	SA-193-B8T/SA-194-8BT
GASKETS	0.175" THK. 304 S.STL SPIRAL WOUND GRAFOIL FILLED GASKET WITH 1/8" THK. C.ST'L OUTER CAGE RING.	SEE SHEET 5 FOR DETAIL

REVISIONS

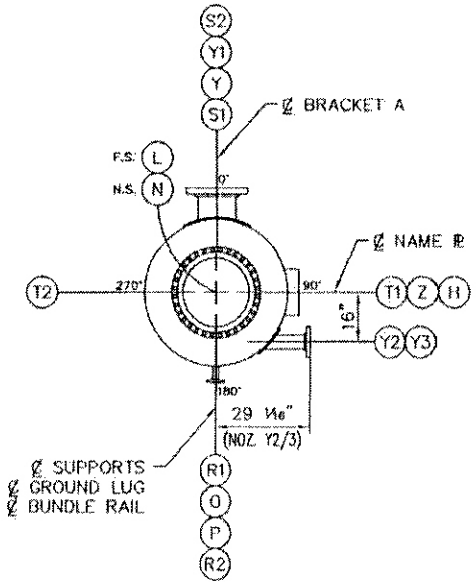
⚠	06/30/05	DELETED NOTE 15 AND CHANGED FILLET WELD SIZE.
⚠	06/14/05	NAME PLATE, CODE REQUIREMENTS, AND FILLER METAL.
⚠	04/07/05	REVISED TUBE SIDE CONE & REVISED MATERIAL OF CONST.
⚠	01/21/05	ADDED NT18 & 19, REVISED NAME PL., WPS.
⚠	03/31/04	GENERAL REVISIONS.

CERTIFIED ENG.
CUSTOMER ORICA NITROGEN
CUSTOMER P.O. NO. 45087373
ITEM NO. EN 601-1015-1 PROJ. NO.
PLANT MORRIS, IL

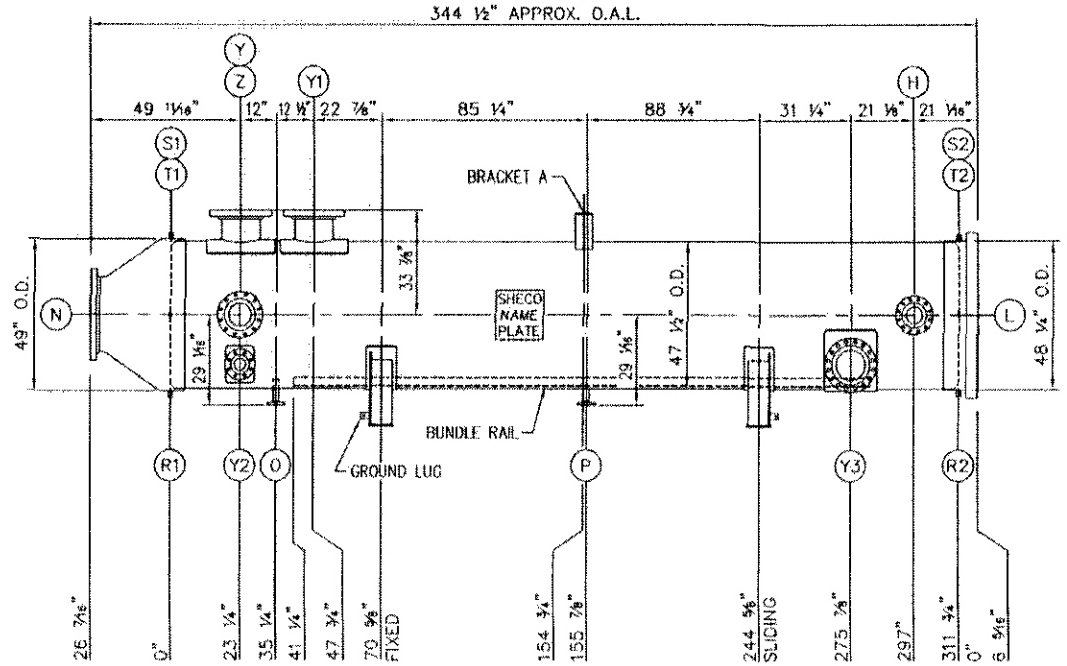
TEMA SIZE AND TYPE
(1) 46-312 NEN H.P. WASTE HEAT EXCHANGER

SOUTHERN HEAT EXCHANGER CORP.
P.O. BOX 1850 TUSCALOOSA, AL. 35403

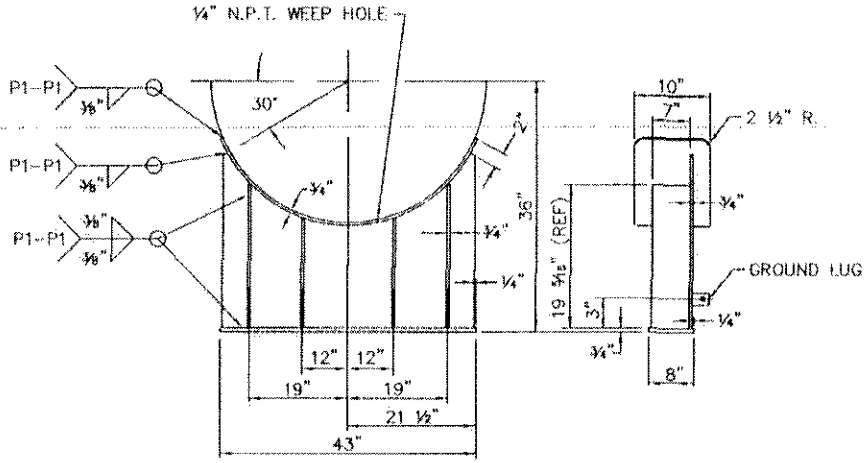
DATE 01/21/04	ORDER NO.	DWG. NO. SB-5602-5
BY S.A.H.	03-407	SHEET 1 OF 7



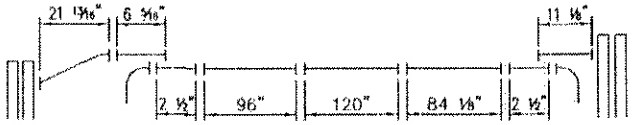
ORIENTATION



ELEVATION



SUPPORT DETAIL



THEORETICAL COURSE LENGTH

C.ST'L

430 S.ST'L (S43000)

304 S.ST'L

321 S.ST'L (S32100)

CERTIFIED	ENG.		
CUSTOMER ORICA NITROGEN			
CUSTOMER P.O. NO. 45087373			
ITEM NO. EN 601-1015-1		PROJ. NO.	
PLANT MORRIS, IL			

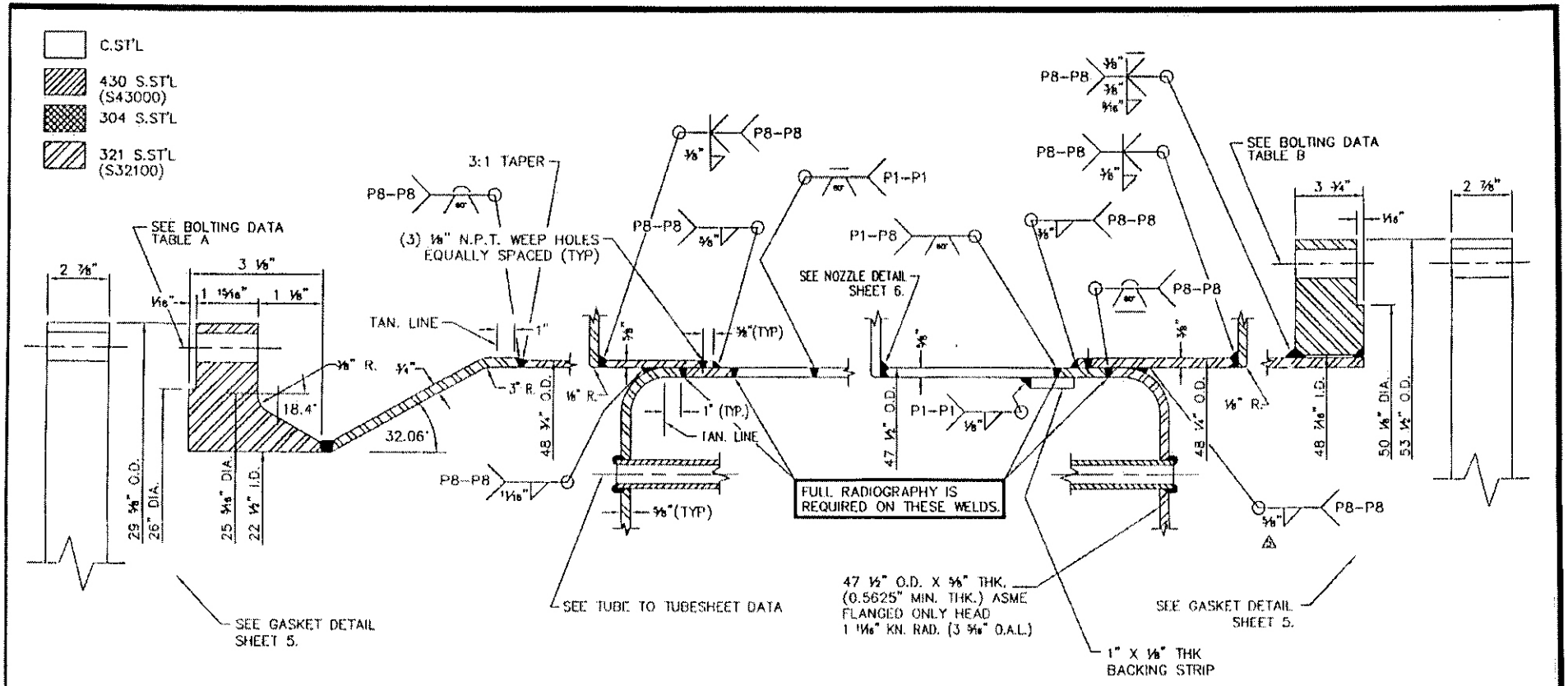
TEMA SIZE AND TYPE

(1) 46-312 NEN H.P. WASTE HEAT EXCHANGER

SOUTHERN HEAT EXCHANGER CORP.

P.O. BOX 1850 TUSCALOOSA, AL. 35403

DATE 01/21/04	ORDER NO.	DWG. NO. SB-5602-5
BY S.A.H.	03-407	SHEET 2 OF 7



BOLTING DATA	TABLE A	TABLE B
BOLT CIRCLE DIA.	27 1/2"	51 3/8"
NO. OF HOLES	32	52
HOLE DIA.	1 1/8"	1 1/8"
STUD SIZE	1"-8	1"-8
STUD LENGTH	6 1/2"	(BY OTHERS)
STUD LENGTH (HYDRO TEST)	7 1/2"	9 1/4"
NO. OF TAPPED HOLES	–	–
TAPPED HOLE DIA.	–	–
TAP SIZE	–	–
NO. TO COUNTERBORE	–	–
COUNTERBORE DIA. x DEPTH	–	–
NO. OF PULLING EYES		
PULLING EYE HOLE DIA.		
PULLING EYE TAP SIZE		

NO OF JACKSCREWS (FLG. ONLY)	
JACKSCREW HOLE DIA.	
JACKSCREW TAP SIZE	
JACKSCREW LOCATION	
NO. OF DOWELS	
DOWEL HOLE DIA. (FLG.)	
DOWEL PIN DIA.	
DOWEL PIN HOLE SIZE (T.S.)	
DOWEL LOCATION	

TUBE TO TUBESHEET DATA	
TUBE PROJ. (LEFT T.S.)	1/16"
TUBE PROJ. (RIGHT T.S.)	1/16"
WELD	1.4T
FILLER METAL	INCO82
SERRATED	NO
AIR TEST	YES
ROLL DEPTH	1/8" OF B.F.
WALL REDUCTION (?)	3-5%
DYE CHECK	YES
HYDRO TEST	YES

CERTIFIED | ENG.

CUSTOMER ORICA NITROGEN

CUSTOMER P.O. NO. 45087373

ITEM NO. EN 601-1015-1 PROJ. NO

PLANT MORRIS, IL

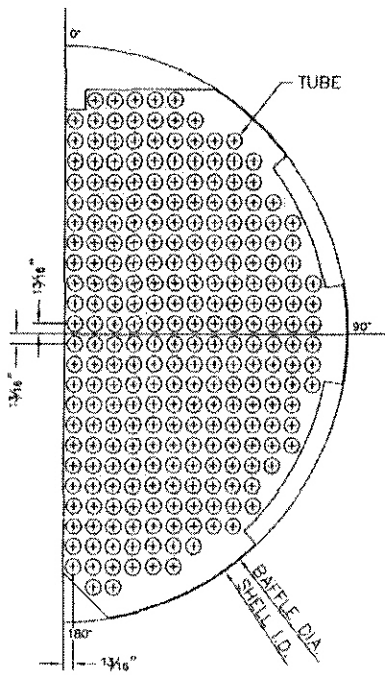
TEMA SIZE AND TYPE

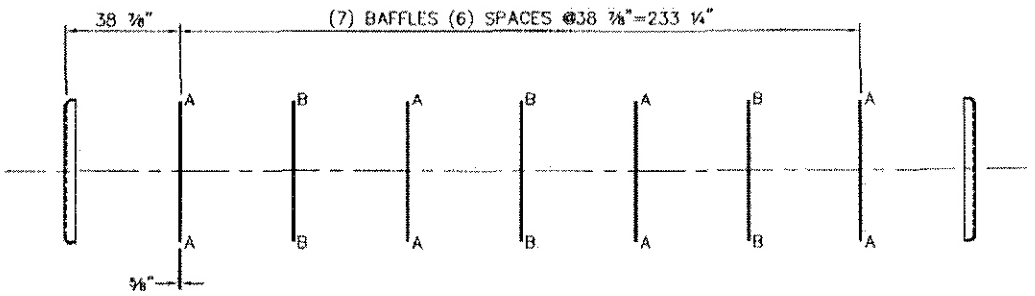
(1) 46-312 NEN H.P. WASTE HEAT EXCHANGER

SOUTHERN HEAT EXCHANGER CORP.

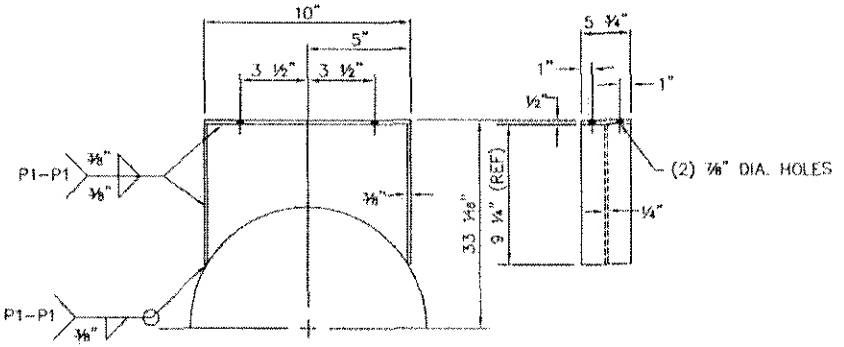
P.O. BOX 1850 TUSCALOOSA, AL. 35403

DATE 01/21/04	ORDER NO.	DWG. NO. SB-5602-5
BY S.A.H.	03-407	SHEET 3 OF 7



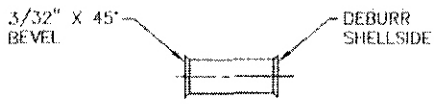


BUNDLE DETAIL



BRACKET A DETAIL

TUBE O.D.	1 1/4"
NO OF TUBE HOLES	514
SIZE OF TUBE HOLE IN TUBESHEET	1.261"
SIZE OF TUBE HOLE IN BAFFLE	1 17/64"
PITCH	1 5/8" 90°
TIE ROD O.D.	–
NO. OF TIE RODS	–
TIE ROD HOLE SIZE IN TUBESHEET	–
TIE ROD HOLE SIZE IN BAFFLE	–
SPACER O.D.	–
DUMMY TUBE O.D.	–
NO. OF DUMMY TUBES	–
DUMMY TUBE HOLE SIZE IN BAFFLES	–
O.T.L.	42.6795"
BAFFLE DIA.	46.0625"
BAFFLE CUT ALTERNATES	(SEE BAFFLE DETAILS SHEET 5)



TUBE HOLE DETAIL

C.ST'L

430 S.ST'L (S43000)

304 S.ST'L

321 S.ST'L (S32100)

CERTIFIED	ENG.	
CUSTOMER ORICA NITROGEN		
CUSTOMER P.O. NO. 4508737 3		
ITEM NO. EN 601-1015-1		PROJ. NO.
PLANT MORRIS, IL		

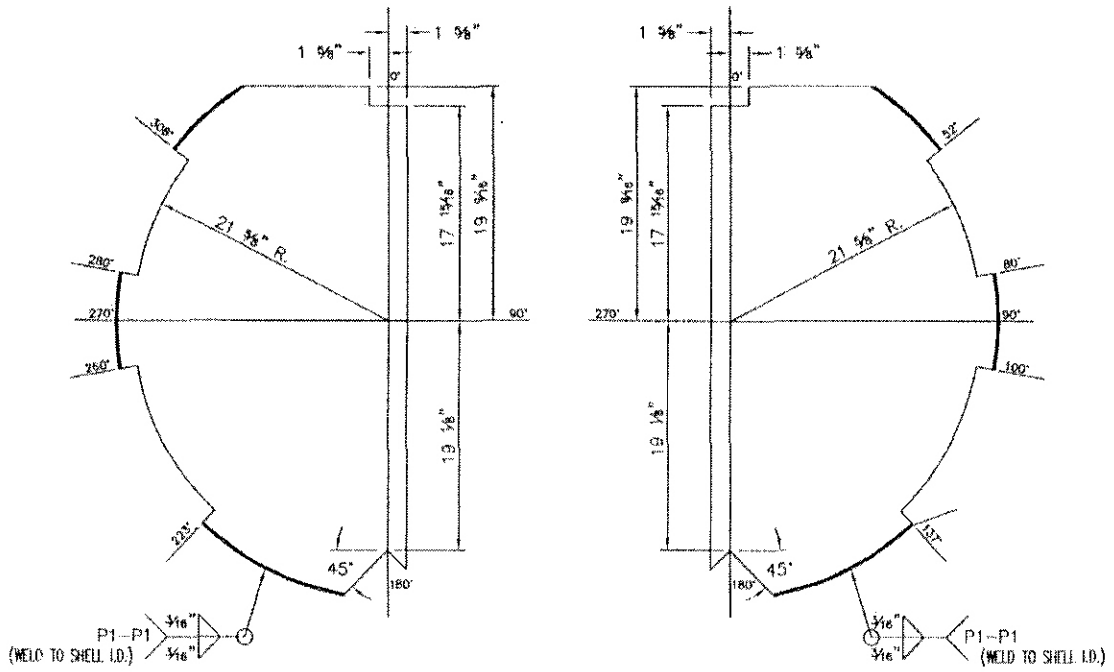
TEMA SIZE AND TYPE

(1) 46-312 NEN H.P. WASTE HEAT EXCHANGER

SOUTHERN HEAT EXCHANGER CORP.

P.O. BOX 1850 TUSCALOOSA, AL. 35403

DATE 01/21/04	ORDER NO.	DWG. NO. SB-5602-5
BY S.A.H.	03-407	SHEET 4 OF 7

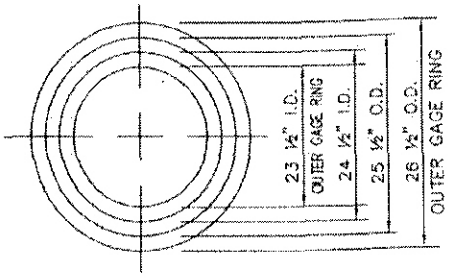


BAFFLE A--A DETAIL

(4) REQ'D

BAFFLE B--B DETAIL

(3) REQ'D

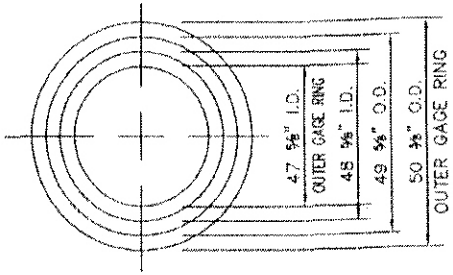


NOZ. N GASKET

(2) REQ'D.

(INCLUDES ONE SPARE SET)

0.175" THK. 321 S.ST'L SPIRAL WOUND MICA COG FILLED GASKET WITH 1/8" THK. 321 S.ST'L INNER & OUTER GAGE RING.

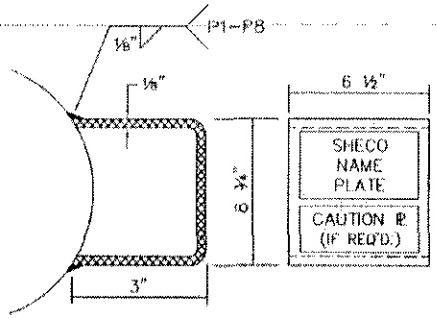


NOZ. L GASKET

(2) REQ'D.

(INCLUDES ONE SPARE SET)

0.175" THK. 321 S.ST'L SPIRAL WOUND TEFLON FILLED GASKET WITH 1/8" THK. 321 S.ST'L INNER & OUTER GAGE RING.



NAME PLATE BRACKET DETAIL

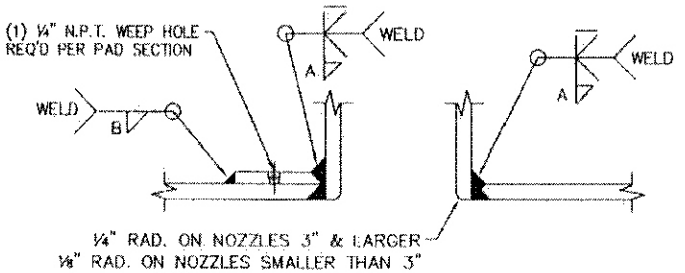
C.ST'L

430 S.ST'L (S43000)

304 S.ST'L

321 S.ST'L (S32100)

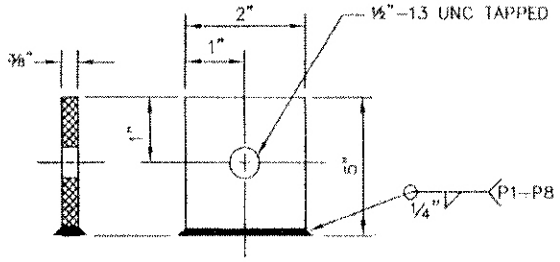
CERTIFIED	ENG.		
CUSTOMER ORICA NITROGEN			
CUSTOMER P.O. NO. 45087373			
ITEM NO. EN 601-1015-1		PROJ. NO.	
PLANT MORRIS, IL			
TEMA SIZE AND TYPE			
(1) 46-312 NEN H.P. WASTE HEAT EXCHANGER			
SOUTHERN HEAT EXCHANGER CORP.			
P.O. BOX 1850 TUSCALOOSA, AL. 35403			
DATE 01/21/04	ORDER NO.	DWG. NO. SB-5602-5	
BY S.A.H.	03-407	SHEET 5 OF 7	



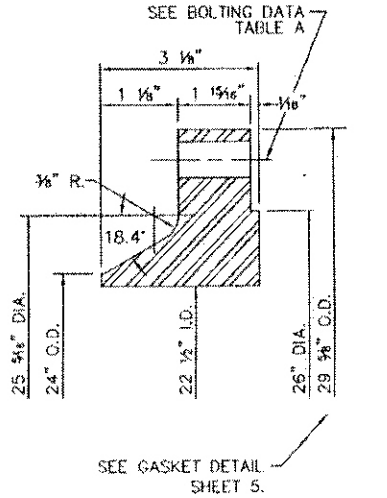
NOZ.	SIZE	PAD THK.	PAD LENGTH	PAD WIDTH	WELD	A	B
Y	12"	5/8"	25"	23"	P1-P1	3/8"	7/16"
Y1	12"	5/8"	25"	23"	P1-P1	3/8"	7/16"
Y2	4"	1/2"	12"	9 1/2"	P1-P1	3/8"	3/8"
Y3	10"	5/8"	23"	17 1/8"	P1-P1	3/8"	7/16"
O	1 1/2"	PAD NOT REQUIRED			P1-P1	3/8"	–
P	1 1/2"	PAD NOT REQUIRED			P1-P1	3/8"	–

NOZZLE WELD DETAIL

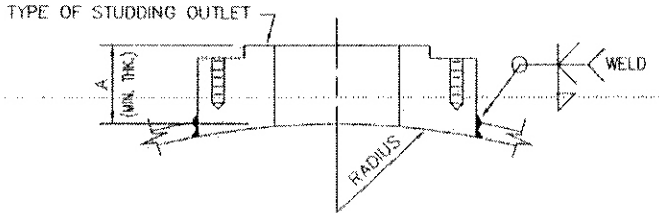
ROLL PAD IN LONG DIRECTION
(2 ½" RAD. ON NOZZLE Y2 PAD CORNERS, ALL OTHER PAD CORNERS WILL BE 3 ⅛" RAD. MINIMUM)



GROUND LUG DETAIL
(2) REQ'D.



NOZZLE N MATING FLANGE DETAIL
(1) REQ'D



STUDDING OUTLET TO SHELL DETAIL

S.H.E. MARK	A	RADIUS	TYPE	WELD	MAT'L
H	2 3/16"	23 1/8"	6"-300#	3/8"	P1-P1
Z	2 9/16"	23 1/8"	8"-300#	3/8"	P1-P1

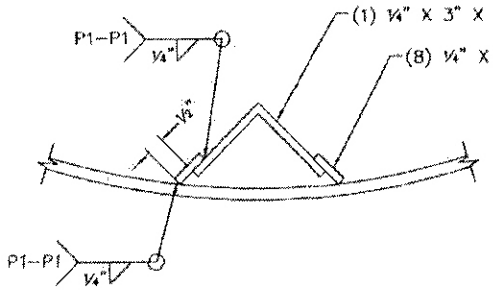
C.ST'L
430 S.ST'L (S43000)
304 S.ST'L
321 S.ST'L (S32100)

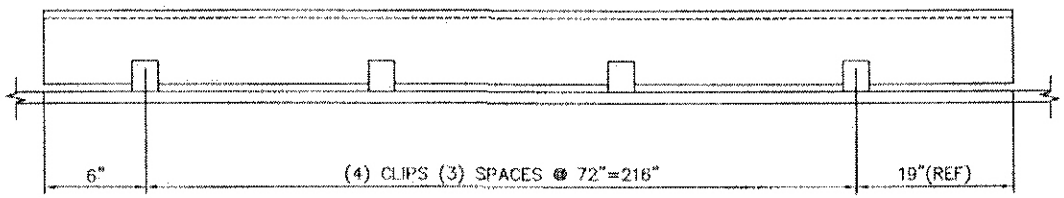
CERTIFIED	ENG.		
CUSTOMER ORICA NITROGEN			
CUSTOMER P.O. NO. 4508737 3			
ITEM NO. EN 601-1015-1		PROJ. NO.	
PLANT MORRIS, IL			

TEMA SIZE AND TYPE
(1) 46-312 NEN H.P. WASTE HEAT EXCHANGER

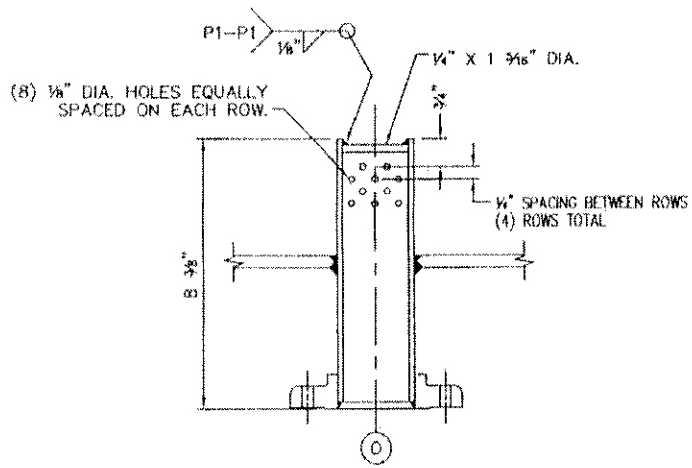
SOUTHERN HEAT EXCHANGER CORP.
P.O. BOX 1850 TUSCALOOSA, AL. 35403

DATE 01/21/04	ORDER NO.	DWG. NO. SB-5602-5
BY S.A.H.	03-407	SHEET 6 OF 7

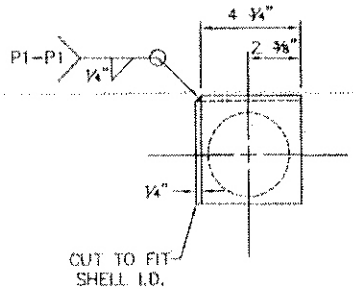


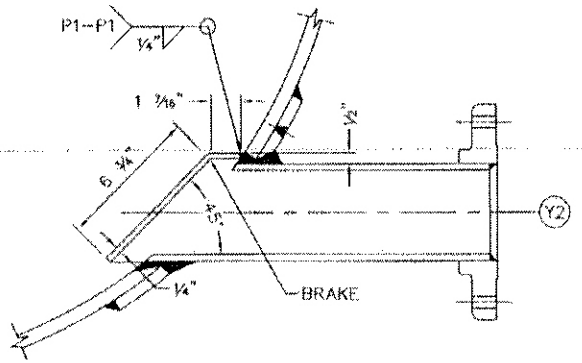


BUNDLE RAIL DETAIL
(1) REQ'D



NOZZLE O DETAIL





NOZZLE Y2/SEAL CUP DETAIL

C.ST'L

430 S.ST'L (S43000)

304 S.ST'L

321 S.ST'L (S32100)

CERTIFIED	ENG.		
CUSTOMER ORICA NITROGEN			
CUSTOMER P.O. NO. 45087373			
ITEM NO. EN 601-1015-1		PROJ. NO.	
PLANT MORRIS, IL			
TEMA SIZE AND TYPE			
(1) 46-312 NEN H.P. WASTE HEAT EXCHANGER			
SOUTHERN HEAT EXCHANGER CORP.			
P.O. BOX 1850 TUSCALOOSA, AL. 35403			
DATE 01/21/04	ORDER NO.	DWG. NO. SB-5602-5	
BY S.A.H.	03-407	SHEET 7 OF 7	

S.H.E. Order # 03-407

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

Item no. EN 601-1015-1

1. Manufactured and certified by Southern Heat Exchanger Corporation 6100 Old Montgomery Highway Tuscaloosa, AL
(Name and address of Manufacturer)

2. Manufactured for Orica Nitrogen, Morris, IL
(Name and address of Purchaser)

3. Location of installation Orica Nitrogen, Morris, IL
(Name and address)

4. Type: Horizontal (Horiz.,vert, or sphere) | Heat Exchanger (Tank,separator,jkt. vessel,heat exh,etc.) | 03-407 (mfg. serial no.) | None (CRN) | SB- 5602- (Drawing No.) | LATER (Nat'l. Bd. No.) | 2005 (Year built)

5. ASME Code, Section VIII,Div. 1: 2001, A03 (Edition and Addenda(date)) | None (Code Case No.) | None (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): 5 (b) Overall length (ft & in): 25'-11 3/4"

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
1/1	47 1/2"	10'-0"/8'-0"	SA-516 GR. 70	5/8"	1/16"	1	Spot	85%	1	Spot	85%	-	
1	47 1/2"	7'-0 1/8"	SA-516 GR. 70	5/8"	1/16"	1	Spot	85%	1	Spot	85%	-	
2	47 1/2"	0'-2 1/2"	SA-240 321	5/8"	0"	1	Spot	85%	1	Spot	85%	-	

7. Heads: (a) SA-240 321 (Mat'l Spec. No., Grade or Type) H.T.- Time & Temp (b) (Mat'l Spec. No., Grade or Type) H.T.- Time & Temp

	Location (Top, Bottom,Ends)	Thickness Min.	Thickness Corr.	Radius Crown	Radius Knuckle	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure Convex	Side to Pressure Concave	Category A Type	Category A Full,Spot,None	Category A Eff.
(a)	Tubesheet	9/16"	1/16"		1 11/16"						X	N/A	None	-
(b)														-

If removable, bolts used (describe other fastening): Welded (Mat'l. Spec. No., Grade, size, no.)

8. Type of jacket: None Jacket closure (Describe as ogee & weld, bar, etc.)

If bar, give dimensions: None If bolted, describe or sketch.

9. MAWP: 305 (internal) F.V. (external) psi at max. temp. 650 (internal) 450 (external) °F. Min. design metal temp 20 °F. at 305 psi

10. Impact test: No per UCS-66(a)(b), UHA-51
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. test press. 425 psig hydro Proof test

Items 12 and 13 to be completed for tube sections

12. Tubesheet: SEE HEADS (Stationary (Mat'l. Spec. No.)) | (Dia., in. (subject to pressure)) | (Nom. thk., in.) | (Corr. Allow., in.) | (Attachment (welded or bolted))

(Floating (Mat'l. Spec. No.)) | (Dia., in.) | (Nom. thk., in.) | (Corr. Allow., in.) | (Attachment)

13. Tubes: SA-268 430 (Mat'l. Spec. No., Grade or Type) | 1 1/4" (O.D., in.) | 14 BWG. (Nom. thk., in. or gauge) | 514 (Number) | Straight (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): 3 (b) Overall length (ft & in): 2'-8 3/4"

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	48 3/4"	0'-6 5/16"	SA-240 321	5/8"	0"	1	Full	100%	1	Full	100%	-	
1	48 1/4"	0'-11 1/8"	SA-240 321	3/8"	0"	1	Full	100%	1	Full	100%	-	
												-	

15. Heads: (a) SA-240 321 (Mat'l Spec. No., Grade or Type) H.T.- Time & Temp (b) (Mat'l Spec. No., Grade or Type) H.T.- Time & Temp

	Location (Top, Bottom,Ends)	Thickness Min.	Thickness Corr.	Radius Crown	Radius Knuckle	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure Convex	Side to Pressure Concave	Category A Type	Category A Full,Spot,None	Category A Eff.
(a)	End	3/4"	0"		2"/3"		32.06°					N/A	None	-
(b)														

If removable, bolts used (describe other fastening): SA-193-B8T(32) ea 1 " dia.
(Mat'l. Spec. No., Grade, size, no.)

16. MAWP 160 (internal) F.V. (external) psi at max. temp. *** (internal) 450 (external) °F. Min. design metal temp. 20 °F. at 160 psi

17. Impact test No per UCS-66(a)(b), UHA-51
(Indicate yes or no and the component(s) impact tested)

18. Hydro., pneu., or comb. test press. 210 psig hydro Proof test

19. Nozzles, inspection, and safety valve openings: (UW-16.1)

Purpose (inlet, Outlet, Drain, etc.)	No.	Diameter or size	Flange Type	Material		Nozzle Thk.		Reinforcement	How Attached		Location
				Nozzle	Flange	Nom.	Corr.	Material	Nozzle	Flange	(Insp. Opn.)
Outlet	2	12"	300#	SA-106 GR. B	SA-105	.500"	0"	SA-516 GR. 70	e	RFSO	
Inlet	1	4"	300#	SA-106 GR. B	SA-105	.337"	0"	SA-516 GR. 70	e	RFSO	
Inlet	1	10"	300#	SA-106 GR. B	SA-105	.500"	0"	SA-516 GR. 70	e	RFSO	
Inlet/Drain	2	1 1/2"	300#	SA-106 GR. B	SA-105	.281"	0"	Inherent	e	RFSO	
Inspection	1/1	6"/8"	300#	N/A	SA-105	N/A	0"	Inherent	e	Stud. Out.	
Vent/Drain	2/2	3/4"	3000	N/A	SA-182 321	N/A	1/16"	Inherent	z-1	Thd. Cplg.	
Misc.	2	1/2"	3000	N/A	SA-182 321	N/A	1/16"	Inherent	z-1	Thd. Cplg.	

20. Supports: Skirt No (Yes or No) Lugs N/A (No.) Legs N/A (No.) Others (2) Saddles (Describe) Attached Shell, Welded (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: UG-46(a)

*** Max. temp. for tube side is INLET= 1100°F, OUTLET= 525°F, TUBES & TUBESHEET= 900°F.

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.

U Certificate of Authorization No. 7037 Expires 11/29 ,2005

Date _____ Name Southern Heat Exchanger Corporation (Manufacturer) Signed _____ (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of GA and employed by One Beacon America of Boston, Ma have inspected the pressure vessel described in this Manufacturer's Data Report on _____, 20 ____, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Futhermore, neither the inspector nor his 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 _____ (Authorized Inspector) Commissions NB11599A GA419 (Nat'l Board incl. endorsement, State, Province and No.)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements on this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME Code, Section VIII, Division 1.

U Certificate of Authorization No. _____ Expires _____ ,20 _____

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

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and 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 Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of _____ psi. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his 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 _____ (Authorized Inspector) Commissions _____ (Nat'l Board incl. endorsement, State, Province and No.)