Williams Field Services

Stewart Dew Point Hickory, PA

7-18-2012

A-Scan Baseline Inspection

Vessel No.: E-110
Vessel Name: Gas/Gas Exchanger

P&ID No: STWT-P01-005

DBI Incorporated
Lincoln Nebraska
4223 Progressive Avenue.Lincoln NE 68504.Telephone: 402-467-1818 Fax: 402-467-1766
Omaha Nebraska
2211 S. 156th Circle.Omaha NE 68130.Telephone:402-330-9612.Fax: 402-330-9640
Overland Park Kansas
11660 West 90th.Overland Park KS 66214.Telephone: 913-888-2321 Fax: 913-888-2351

Summary Report

Report Reviewed By: Mitchell Beres

API 510 #30888

Client: Williams Field Services
Location: Stewart Dew Point Hickory, PA

Vessel No.: E-110
Vessel Name: Gas/Gas Exchanger

Inspection Date: 7-18-2012

Type of Inspection: A-Scan Baseline Inspection

Note: An A-Scan baseline inspection was performed on the E-110 Gas/Gas Exchanger. The E-110 Gas/Gas Exchanger meets MAWP of 1000 psi with a remaining service life of 20+ years. The long and short term corrosion rates were determined using the nominal thickness of the vessel.

Next UT Inspection: **7/17/2017** **API 510 para. 6.4**

Next Visual Inspection: **7/17/2017**

								Short Term Corrosion Rate	**Long Term Corrosion Rate**	**Remaining Life (Years)**
	TNom	**Top**	**Bottom**	**North**	**South**	**East**	**West**			
North Head				0.726						
TML 1	0.625	0.625	0.624			0.626	0.626	<1 mil	<1 mil	20+
TML 2	0.625	0.623	0.625			0.626	0.624	<1 mil	<1 mil	20+

Client: Williams Field Services
Location: Stewart Dew Point Hickory, PA

Vessel No.: E-110
Vessel Name: Gas/Gas Exchanger

Vessel Parameters

Design Pressure (MAWP):	1000 psi	North Head Material:	SA-516-70N
Design Temperature:	150 F	North Head Type:	2:1 Ellipsoidal
Operating Pressure:	615 psi	Allowable Stress:	20,000
Operating Temperature:	100 F	Joint Efficiency:	1.0
Diameter: I.D or O.D	20"	South Head Material:	SA-516-70N
Length S/S:	24'-5 1/8"	South Head Type:	2:1 Ellipsoidal
Shell Material:	SA-516-70N	Allowable Stress:	20,000
Allowable Stress:	20,000	Joint Efficiency:	1.0
Joint Efficiency:	1.0	Date Manufactured:	2008
Corrosion Allowance:	.125	In Service Date:	2008

ASME CODE EDITION USED FOR CALCULATIONS
ASME Section VIII, Division 1. 2001 Edition

Paint Information

Average paint coating thickness:	N/A	Thickness measured with paint:	N/A
Paint Multiplier:	N/A	Thickness measured without paint:	N/A

Name Plate Information

U1A Available:	Yes	ASME stamp present on vessel:	Yes
Name Plate present:	Yes	Rubbing taken:	Digital Photo

Client: Williams Field Services
Location: Stewart Dew Point Hickory, PA

Vessel No.: E-110
Vessel Name: Gas/Gas Exchanger

Vessel Data

Vessel Class:	2	Date Manufactured:	2008
Manufactures Serial #:	13007-4	In Service Date:	2008
Product in Vessel:	Gas	Date of ASME VIII Vessel Mfg. under:	2007
P&ID Drawing #:	005	Code Cases:	N/A
P&ID Prepared By:	Laurel Mountain Midstream, LLC	Addenda:	2007
Manufacturer:	Heat Transfer Systems, Inc.	National Board Number:	1917
Vessel Length S/S:	24'-5 1/8"	Vessel Insulated:	Yes
Diameter I.D or O.D:	20"	Describe openings (if any):	1 3/4" Ports
No. of Shell Sections:	4	ANSI Flange Rating:	300 #
No. of Nozzles:	7	Vessel Orientation:	Horizontal
Design Pressure (MAWP):	1000 psi	Operating Pressure:	615 psi
Design Temperature:	150 F	Operating Temperature:	100 F
North Head Type:	2:1 Ellipsoidal	South Head Type:	2:1 Ellipsoidal
North Head Material:	SA-516-70N	South Head Material:	SA-516-70N
North Head Weld Type:	Single Butt	South Head Weld Type:	Single Butt
Shell Material:	SA-516-70N	Shell Weld Type:	Type 1
Radiography:	Full	Hydrostatic:	1300 psi

Relief Valve Information

Relief Valve Tag Number:	228	Relief Valve Pressure Setting:	1000 psi
Relief Valve Test Date:	9-15-2010	Relief Valve Size:	1" x 1"

DBI, Inc. Quality Inspection and Consulting Services

Reliable...Responsive...Resourceful...Proactive

PRESSURE VESSEL EXTERNAL INSPECTION

Client:	Williams Field Services	Date Inspected:	7-18-2012
Location:	Stewart Dew Point Hickory, PA	Inspector(s):	Mike Troyer
Vessel No.:	E-110		
Vessel Name:	Gas/Gas Exchanger	Signature:	

NAME PLATE

Item Inspected Yes No NA = Not Applicable	Yes	No	N/A	Comments:
Name Plate present & legible	☒	☐	☐	Good condition
National Board #	☒	☐	☐	1917
Manufacturer	☒	☐	☐	Heat Transfer Systems, Inc.
Serial #/ Year Built	☒	☐	☐	13007-4/ 2008
Repair or Rerate Name Plate	☐	☐	☒	N/A

FOUNDATION

Concrete condition (spalling, cracks)	☒	☐	☐	None noted
Foundation settling	☒	☐	☐	Appears level
Coating condition	☐	☐	☒	N/A
Cradle supports (moisture, cracks)	☒	☐	☐	None noted

SUPPORTS

Describe type (legs, saddle, etc.)	☒	☐	☐	Legs
Corrosion, pitting (describe)	☒	☐	☐	None noted
Weld condition	☒	☐	☐	Good condition
Paint condition	☒	☐	☐	No paint failure noted
Anchor bolts (tightness & corrosion	☒	☐	☐	Appears tight
Insulation deterioration	☒	☐	☐	None noted

SHELL

Corrosion, pitting (describe)	☐	☐	☒	N/A
Bulges/ Blisters/ Deformations	☐	☐	☒	N/A
Weld condition	☐	☐	☒	N/A
Paint condition	☐	☐	☒	N/A
Insulation deterioration	☒	☐	☐	None noted
Biological growth	☒	☐	☐	None noted
UT Measurements	☒	☐	☐	See autocad drawing

HEADS

Item Inspected Yes No NA = Not Applicable	Yes	No	N/A	Comments:
Corrosion, pitting (describe)	☐	☐	☒	N/A
Bulges/ Blisters/ Deformations	☐	☐	☒	N/A
Weld condition	☐	☐	☒	N/A
Paint condition	☐	☐	☒	N/A
Insulation deterioration	☒	☐	☐	None noted
UT Measurements	☒	☐	☐	See autocad drawing

MANWAYS & NOZZLES

Corrosion, pitting (describe)	☐	☐	☒	N/A
Weld condition	☐	☐	☒	N/A
Flange condition	☐	☐	☒	N/A
Bolting condition	☐	☐	☒	N/A
Repad condition	☐	☐	☒	N/A
Insulation deterioration	☒	☐	☐	None noted
UT Measurements	☐	☐	☒	N/A

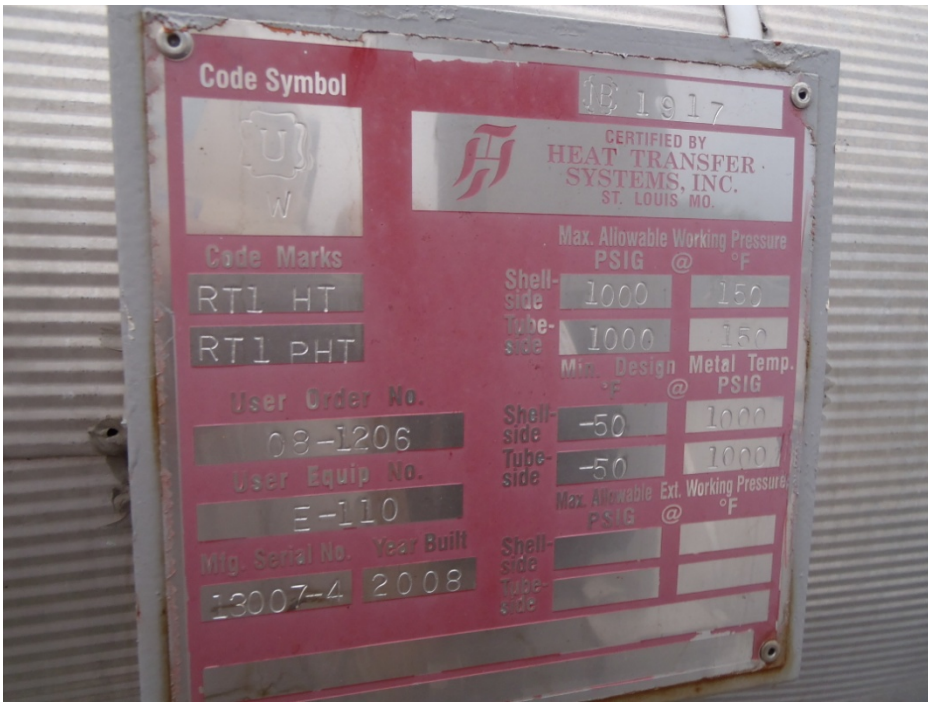
APPURTENANCES

Grounding (tightness & corrosion)	☒	☐	☐	Ground connection is tight
Gauges, Sight glass (damage)	☒	☐	☐	No damage noted
Relief Valve #/ Size/ Set Pressure	☒	☐	☐	228/ 1" x 1"/ 1000 psi

LADDERS, STAIRS, PLATFORMS

Corroded, Broken Parts	☐	☐	☒	N/A
Paint condition	☐	☐	☒	N/A
Wear (ladder rungs, stair treads)	☐	☐	☒	N/A
Handrails secure	☐	☐	☒	N/A
Flooring condition	☐	☐	☒	N/A
Tightness (bolts, tie down clips)	☐	☐	☒	N/A
Attachment welds	☐	☐	☒	N/A
Corrosion, pitting (describe)	☐	☐	☒	N/A

ADDITIONAL COMMENTS:


Code Symbol
U
W
1917
CERTIFIED BY
HEAT TRANSFER SYSTEMS, INC.
ST. LOUIS MO.
Code Marks
RT1 HT
RT1 PHT
User Order No.
08-1206
User Equip No.
E-110
Mfg. Serial No.
13007-4
Year Built
2008
Max. Allowable Working Pressure
PSIG @ °F
Shell-side 1000 150
Tube-side 1000 150
Min. Design Metal Temp.
°F @ PSIG
Shell-side -50 1000
Tube-side -50 1000
Max. Allowable Ext. Working Pressure
PSIG @ °F
Shell-side
Tube-side

E-110
GAS/GAS HEAT EXCH

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

equired by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

1. Manufactured and certified by HEAT TRANSFER SYSTEMS, INC., 8100 POLK, ST. LOUIS, MO. 63111 (Name and address of Manufacturer)
2. Manufactured for PREMIER INDUSTRIES., 3450 PETERS ROAD, HARVEY, LA. 70059 (Name and address of Purchaser)
3. Location of installation UNKNOWN (Name and address)
4. Type: HORIZONTAL (Horizontal, vertical, or sphere) | HEAT EXCHANGER (Tank, separator, jkt., vessel, heat exch., etc.) | 13007-3, 4. (Manufacturer's serial number)
N/A (CRN) | B-3007-3-01 (Drawing number) | 1916, 1917. (National Board number) | 2008 (Year built)
5. ASME Code Section VIII Div 1 2007 Ed / A 2007 [Edition and Addenda (date)] | N/A (Code Case number) | N/A [Special Service per UG-120(d)]

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

6. Shell: (a) Number of course (s) 4 (b) Overall Length 24' - 5 1/8"

Course(s)			Material	Thickness		Long. Joint (Cat. A)			Circum Joint (Cat. A B & C)			Heat Treatment	
No.	Diameter	Length	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff	Temp.	Time
3	20"	8' - 0"	SA-516, Gr. 70N	0.6250"	0.1250"	1	FULL	100%	1	FULL	100%	1150 F.	0.75 Hr.
1	20"	5 1/8"	SA-516, Gr. 70N	0.6250"	0.1250"	1	FULL	100%	1	FULL	100%	1150 F.	0.75 Hr.

7. Heads: (a) SA-516, Gr. 70N (Material spec. number, grade or type) 1150 F. 0.75 Hr. (H. T. - time & temp) (b) (Material spec. number, 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)	R - END	0.625"	0.125"			2:1					X	S	NONE	100%
(b)														

If removable, bolts used (describe other fastenings)

8. Type of jacket (Material spec. number grade, size, number) jacket closure (Describe as ogee &weld, bar, etc.)
If bar, give dimensions If bolted, describe or sketch

9. M... P 1000 (Internal) (External) at max temp. 150 (Internal) (External) Min. design metal temp. -50 at 1000

10. Impact Test NONE PER UG-20 (f), UCS-66, AND UHA-51 [Indicate yes or no and the component(s) impact tested] at test temperature of

11. Hydro., Pneu., or comb. test press. HYDRO - 1300 PSI Proof Test

:ems 12 and 13 to be completed tube sections.

12. Tubesheet SA-240, TP304 [Stationary (Material spec. number)] | 25 1/2" [Diameter (subject to press.)] | 2 3/4" (Nominal thickness) | 0" (Corr. Allow.) | BOLTED [Attachment (welded or bolted)]

13. Tubes [Floating (Material spec. number)] SA-249, TP304 WLD (Material spec. number, grade or type) | 3/4" (Diameter) (O. D.) | 0.065" Avg. (Nominal thickness) (Nominal thickness) | 131 (Corr. Allow.) (Number) | U - TUBES (Attachment) [Type (Straight or U)]

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

14. Shell: (a) Number of course (s): 1 (b) Overall Length 1' - 0 1/2"

Courses			Material	Thickness		Long. Joint (Cat A)			Circum Joint (Cat. A B & C)			Heat Treatment	
).	Diameter	Length	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff	Temp.	Time
	20"	1' - 0 1/2"	SA-516, Gr. 70N	0.6250"	0.1250"	1	FULL	100%	1	FULL	100%	1150 F.	0.75 Hr.

5. Heads: (a) SA-516, Gr. 70N (Material spec. number, grade or type) 1150 F. 0.75 Hr. (H. T. - time & temp) (b) (Material spec. number, 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)	L - END	0.625"	0.125"			2:1					X	S	NONE	100%
b)														

removable, bolts used (describe other fastenings) 1 1/8"- 28 PCS OF SA-193-B7 STUDS AND 1 1/8"- 56 PCS OF SA-194-2H NUTS (Material spec. number, grade, size, number)

E-110

Form U-1 (Back)

1000 (Internal) _____ (External) at max temp. 150 (Internal) _____ (External) Min. design metal temp. -50 at 1000

t Test NONE PER UG-20 (f), UCS-66, AND UHA-51 at test temperature of _____
Indicate yes or no and the component(s) impact tested

ydro., pneu., or comb. test press. HYDRO - 1300 PSI Proof Test _____

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
S-INLET	1	4"	RFWN	SA-106-C SML	SA-105	0.4380"	0.1250"	SA-516, Gr. 70	c	b	
S-OUTLET	1	4"	RFWN	SA-106-C SML	SA-105	0.4380"	0.1250"	SA-516, Gr. 70	c	b	
T-INLET	1	4"	RFWN	SA-106-C SML	SA-105	0.4380"	0.1250"	SA-516, Gr. 70	c	b	
T-OUTLET	1	4"	RFWN	SA-106-C SML	SA-105	0.4380"	0.1250"	SA-516, Gr. 70	c	b	
T-SPRAY NOZZLES	3	1"	CPLG	--	SA-105	3000#	0.1250"		c	--	

20. Supports: Skirt NO (Yes or No) Lugs N/A (Number) Legs N/A (Number) Others SADDLE SUPPORTS (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, Manufacturer's name and identifying number)

22. Remarks

CERTIFICATE OF SHOP COMPLIANCE

certify that the statements in this report are correct and that all details of design, material, construction and workmanship of this vessel orm to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization 20649 Expires 11/04/2009

Date 10/15/08 Name HEAT TRANSFER SYSTEMS, INC. (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/or the State or Province of MO and employed by OneBeacon America Insurance Co of BOSTON MASS. have inspected the pressure vessel described in this Manufacturer's Data Report on 10-17-08, 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.

Date 10-17-08 Signed _____ (Authorized Inspector) Commissions NB9098(A) MO0213 [National Board (incl endorsements) State, Province and number]

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

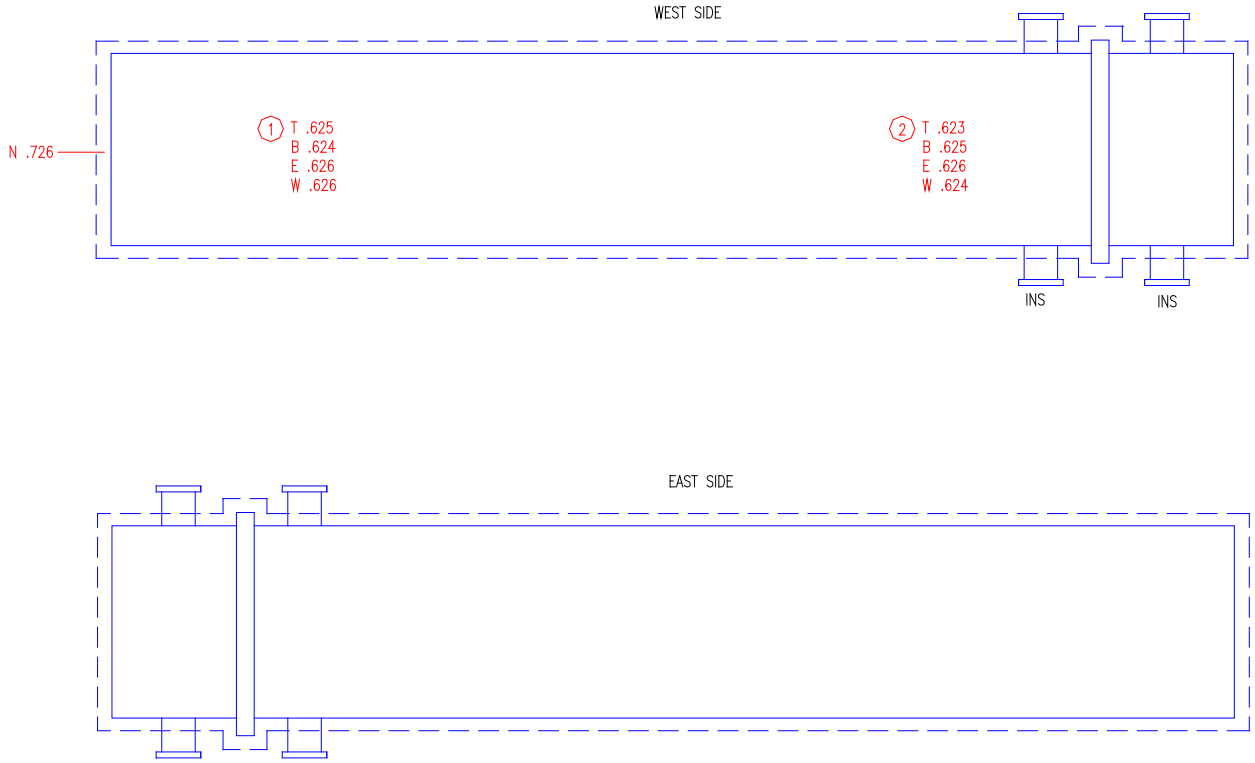
We certify that the statements on this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME BOILER AND PRESSURE VESSEL CODE Section VIII, Division 1. U Certificate of Authorization No. _____ Expires _____

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/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 ... cted by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance w... the 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 _____ (Authorized Inspector) Commissions _____ [National Board (incl endorsements) State, Province and number]



NOTES

1. P&ID NO: STWT-P01-005
2.
3.
4.
5.
6.

CLIENT: Williams Field Services	**DBI, Incorporated** 5330 N. 57th Street Lincoln, Nebraska 68507
LOCATION: Stewart Dew Point Hickory. PA	
INSPECTION DATE: 7-18-2012	ACAD DWG. FILE: E-110
VESSEL No: E-110	DWN BY: MCS / CKD BY:
VESSEL ID: Gas/Gas Exchanger	MECHANICAL INTEGRITY INSPECTION