



1595 So. Hwy 150, Suite F
Evanston, WY 82930

Inspections Performed for: FMC Technologies Completion – Grand Junction

Inspection Report for: LH-0010 Line Heater

Date Last Inspected: 02/14/2016

Next UT: 02/14/2017

Next VT: 02/14/2017

LH-0010 Line Heater



PRESSURE VESSEL INVENTORY

☒ Code ☐ Code-invalidated ☐ Non-Code ☐ Unknown ☐ Code-Exempt

☐ High Consequence (HCO) ☐ Medium Consequence (MCO) ☐ Low Consequence (LCO)

VESSEL ID INFORMATION

Company Name : Pure Energy Services (USA) Inc.
Facility/Location Name : Grand Junction District
Field Name :
Equipment Number : LH-0010
Eq/Circ. ID : LH0010-C1/C2
Equipment Name/Service : Line Heater
Physical Location : In Grand Junction Yard
GPS Coordinates :

VESSEL DESCRIPTION AND SERVICE CONDITIONS

Type of Vessel: Horizontal Line Heater

Vessel Size:

Operating Pressure Range (psig):

Operating Temperature Range (°F):

Does the vessel have Internal Access?

Specify type of internal access, if available:

Vessel is located: Outside

MISCELLANEOUS VESSEL INFORMATION: (IF VESSEL HAS NO NAMEPLATE, PLEASE OBTAIN AS MUCH OF THE FOLLOWING AS POSSIBLE FOR WORST CASE TMIN CALCULATIONS, *may have to check with operations personnel*).

Is there a Long Seam?

Any stamping pertaining to materials of construction?

****Diameter****(strap equipment): _____

Pressure (highest the equip. sees in the process and/or check PSV setting if available) _____psi

Temperature (highest the equipment would ever see in the process) _____

Approximate Date built or installed (check associated equipment or info at facility) _____

Any other pertinent information: _____

PRESSURE VESSEL INVENTORY

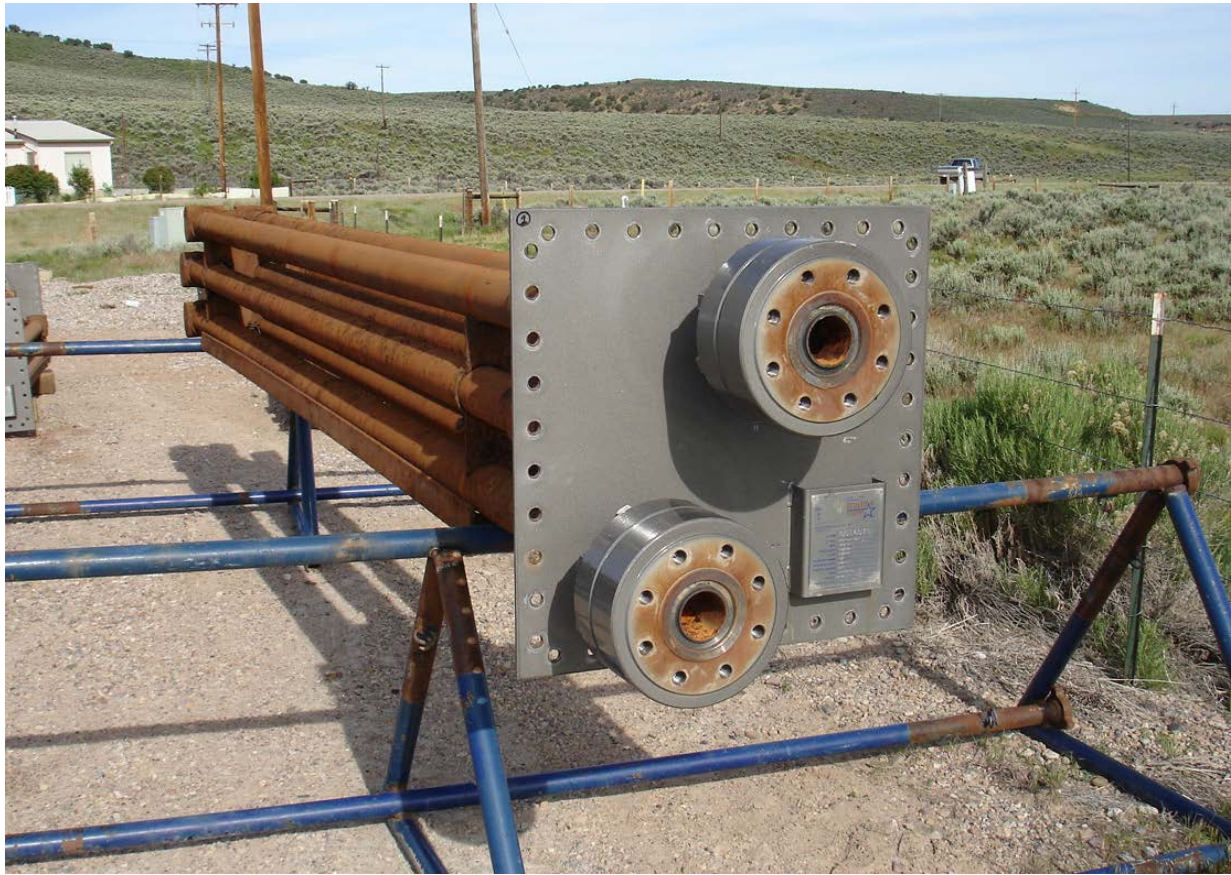
ORIGINAL VESSEL NAMEPLATE/STAMPING INFORMATION

Code stamp: ☐ U stamp ☐ U2 stamp ☐ UM stamp ☐ API-ASME ☒ No stamp

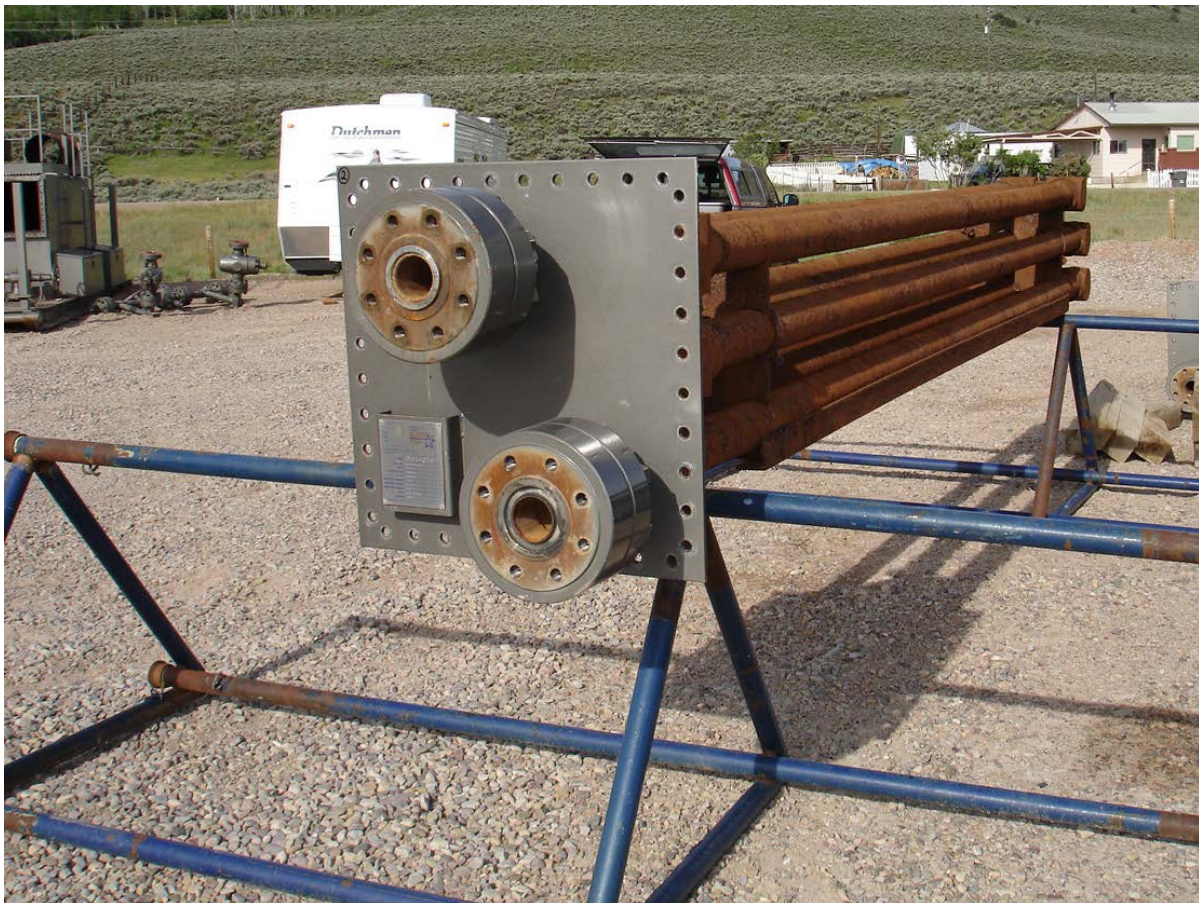
Coil #1

RTI W HT	MANUFACTURED & CERTIFIED BY: BLUESTAR WELDING 
GRANDE PRAIRIE, AB., CANADA  1-780-532-1160	
A-NUMBER	514078
SERIAL No.	BS10K4MM-05A
JOB No.	10252-P
DESIGN PRESSURE	10000 PSI
M.A.W.P.	10000 PSI
DESIGN TEMP. MINIMUM	-40°F
CORROSION ALLOWANCE	0.125 IN.
DESIGN TEMP. MAXIMUM	180°F
CRN No.	ALD-05-001
YEAR BUILT	2005
STEAM COIL M.A.W.P.	@ °F

Coil #1



Coil #2





Coil #2

RTI W HT	MANUFACTURED & CERTIFIED BY: BLUESTAR WELDING 
GRANDE PRAIRIE, AB., CANADA  1-780-532-1160	
A-NUMBER	① 514079
SERIAL No.	BS10K4MM-05 B
JOB No.	10252-P
DESIGN PRESSURE	10000 PSI
M.A.W.P.	10000 PSI
DESIGN TEMP. MINIMUM	-40°F
CORROSION ALLOWANCE	0.125 IN.
DESIGN TEMP. MAXIMUM	180°F
CRN No.	ALD-05-001
YEAR BUILT	2005
STEAM COIL M.A.W.P.	<input type="text"/> @ <input type="text"/> °F

VESSEL DOCUMENTATION

Manufacturer Data Sheets: ☐ ASME U-1 or U-1A Forms ☐ U2 or U4 Supplemental Forms
☐ Documentation relating to repair/alteration/rerating work: (R-1 form, calculations, revised drawings, inspection reports, etc.)

Name: Robert W. Menke

Date: 02/04/2012

*Revised 2/2016

EQUIP RETIREMENT DATE: 10/29/2042
NEXT INSPECTION IS DUE: 2/13/2017

N1		N13	
N2		N14	
N3		N15	
N4		N16	
N5		N17	
N6		N18	
N7		N19	
N8		N20	
N9		N21	
N10		N22	
N11		N23	
N12		N24	

TC-560

NAMEPLATE INFO	
MFG	BLUESTAR WELDING
SERIAL NUMBER	BSFGS229
NATIONAL BOARD #	NONE
DATE BUILT	2004
DESIGN P & T	150 PSI @ 100°F
NOTE	NO "U" STAMP CRN DH-6510.2

CAL BLK=47°F VESSEL=38°F

BUSINESS UNIT	FMC TECHNOLOGIES COMPLETION
EQ/CIRC ID #	LH0010-FGS-1
EQUIP NAME	FUEL GAS SCRUBBER
LOCATION	ON LINE HEATER LH-0010
DWG #	LH0010-FGS-1

DESC: FUEL GAS SCRUBBER ON LH-0010
DWG#: LH0010-FGS-1-2.01-3.04

Corrosion Monitoring Eq/Circ ID Analysis Report

Eaton Inspection Services
 1595 So Hwy 150, Suite F, Evanston, WY 82930
 Phone 307-789-3540 FAX 307-789-2822

Report Date:06/27/2016

(Report in inches, Corrosion Rates in MPY)
 Analysis: Straight Line

Unit: LH-0010
 Eq/Circ ID: LH0010-FGS-1
 Eq Type: VESSEL
 Class:
 CM RBI:
 Design Code: S8/D1

Flange Rating: 285 lb/in²
 Design Pressure: 150 lb/in²
 Design Temperature: 100 °F

Description: FUEL GAS SCRUBBER ON LH0010, SN:BSFGS229
 (8.625" PIPE)-FLAT HEADS, SHELL UT ONLY

Summary: Group Name:
 Insp. Due Date = 02/13/2017
 Pred. Ret. Date = 10/29/2042

Group Description:
 RCR = 0.1 MPY
 Rem. Life (from last survey 02/14/2016) = 26.7 yrs

0 C.A. Status: NO
 Total Caution TMLs = 0

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
2.01	SH-FRONT	N	0.330 TC	09/11/2009	0.323 TC	03/10/2014	0.326 TC	02/14/2016	0	0.6	0.2	5.1	0.282 U	0.6	06/15/2089	02/13/2017
2.02	SH-LEFT	N *	0.316 TC	09/11/2009	0.312 TC	03/10/2014	0.312 TC	02/14/2016	0	0.6	0	6.3	0.282 U	0.6	02/14/2066	02/13/2017
2.03	SH-BACK	N *	0.314 TC	09/11/2009	0.307 TC	03/10/2014	0.309 TC	02/14/2016	0	0.8	0.3	3.9	0.282 U	0.8	11/14/2049	02/13/2017
2.04	SH-RIGHT	N *	0.322 TC	09/11/2009	0.313 TC	03/10/2014	0.306 TC	02/14/2016	3.6	2.5	2.3	3.6	0.282 U	3.6	10/15/2022	02/13/2017
3.01	SH-FRONT	N *	0.326 TC	09/11/2009	0.312 TC	03/10/2014	0.315 TC	02/14/2016	0	1.7	2.1	8.5	0.282 U	1.7	07/14/2035	02/13/2017
3.02	SH-LEFT	N	0.314 TC	09/11/2009	0.319 TC	03/10/2014	0.321 TC	02/14/2016	0	0	0	6.6	0.282 U	0.1	02/17/2406	02/13/2017
3.03	SH-BACK	N *	0.316 TC	09/11/2009	0.319 TC	03/10/2014	0.311 TC	02/14/2016	4.1	0.8	0.3	4.7	0.282 U	4.1	03/12/2023	02/13/2017
3.04	SH-RIGHT	N *	0.327 TC	09/11/2009	0.318 TC	03/10/2014	0.321 TC	02/14/2016	0	0.9	0.8	4.6	0.282 U	0.9	06/16/2059	02/13/2017

Eaton Inspection Services
1595 So Hwy 150, Suite F, Evanston, WY 82930
Phone 307-789-3540 FAX 307-789-2822

Report Date: 06/27/2016

(Report in Inches, Corrosion Rates in MPY)
Analysis: Straight Line

Unit: LH-0010
Eq/Circ ID: LH0010-FGS-1
Design Code: S8/D1
Eq Type: VESSEL
Class:
CM RBI:

Flange Rating: 285 lb/in²
Design Pressure: 150 lb/in²
Design Temperature: 100 °F

Description: FUEL GAS SCRUBBER ON LH0010, SN:BSFGS229
(8.625" PIPE)-FLAT HEADS, SHELL UT ONLY

TML Corrosion Rates are each the Maximum of:

(A) -- Calculated Corrosion Rates x 1.00	:	Varies
(B) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate is the Maximum of:

(A) -- Average Corrosion Rate x 1.10	:	Not Used.
(B) -- Average Max 25.0% of TMLs, Min of 2	:	Not Used.
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	Not Used.
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 0.1 MPY

TML thickness readings have not been compensated for high Temperatures.
TML thickness readings have not been compensated for growths.

TML Life calculations are based on the Representative TML Corrosion Rate using Short
Term and Long Term Corrosion Rates.

Nominal thickness is used for TML corrosion rate calculations with less than 3 surveys.

Minimum time between inspections required for corrosion rate calculation is 3 months.

TML Inspection Interval is:
(A) -- 1.00 years.

Eq/Circ ID Last Survey Date is based on the LAST of the last 0% of TML survey dates (Min 1).

Eq/Circ ID Estimated life = 26.7 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 25% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 10/29/2042

Recommended Eq/Circ UT/RT Inspection Date is 02/13/2017
UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
There are 0 Caution TMLs in this Eq/Circ ID.



1595 So. Hwy 150, Suite F
Evanston, WY 82930

Inspections Performed for: FMC Technologies Completion- Grand Junction	
Inspection Report for: LH-0010 FGS-2	
Remaining Life: 20+YRS	Date Last Inspected: 02/14/2016
Representative Corrosion Rate: 0.1 MPY	Next UT: 02/14/2017 Next VT: 02/14/2017
Manufacturer: Bluestar Welding	Manufacturer Serial #: BSFGS230
Year Built: 2004	National Board #: None
Alberta Registration #: None	Canadian Registration #: OH 6510.2

LH-0010-FGS-2 Fuel Gas Scrubber



PRESSURE VESSEL INVENTORY

☒ Code ☐ Code-invalidated ☐ Non-Code ☐ Unknown ☐ Code-Exempt

VESSEL ID INFORMATION

Company Name : Pure Energy Services (USA) Inc.
Facility/Location Name : Grand Junction District
Field Name :
Equipment Number : LH-0010
Eq/Circ. ID : LH0010-FGS-2
Equipment Name/Service : (Line Heater) Fuel Gas Scrubber
Physical Location : On LH-0010
GPS Coordinates :

VESSEL DESCRIPTION AND SERVICE CONDITIONS

Type of Vessel: Vertical Fuel Gas Scrubber

Vessel Size: 8.625"

Operating Pressure Range (psig): N/A

Operating Temperature Range (°F): N/A

Does the vessel have Internal Access? No

Specify type of internal access, if available:

Vessel is located: Outside

MISCELLANEOUS VESSEL INFORMATION: (IF VESSEL HAS NO NAMEPLATE, PLEASE OBTAIN AS MUCH OF THE FOLLOWING AS POSSIBLE FOR WORST CASE TMIN CALCULATIONS, *may have to check with operations personnel*).

Is there a Long Seam?

Any stamping pertaining to materials of construction?

****Diameter****(strap equipment): _____

Pressure (highest the equip. sees in the process and/or check PSV setting if available) _____psi

Temperature (highest the equipment would ever see in the process) _____

Approximate Date built or installed (check associated equipment or info at facility) _____

Any other pertinent information: _____

PRESSURE VESSEL INVENTORY

ORIGINAL VESSEL NAMEPLATE/STAMPING INFORMATION

Code stamp: ☐ U stamp ☐ U2 stamp ☐ UM stamp ☐ API-ASME ☒ No stamp

VESSEL DOCUMENTATION

Manufacturer Data Sheets: ☐ ASME U-1 or U-1A Forms ☐ U2 or U4 Supplemental Forms
☐ Documentation relating to repair/alteration/rerating work: (R-1 form, calculations, revised drawings, inspection reports, etc.)

Name: Robert W. Menke

Date: 02/04/2012

API 510 PRESSURE VESSEL EXTERNAL INSPECTION REPORT

Company Name: FMC Technologies Completion	
Field/Location: Grand Junction	
Equipment Number: LH-0010	Eq/Circ. ID: LH0010-FGS-2
Equipment Name/Service: Fuel Gas Scrubber	
Physical Location: GR 14-28 Pad	
Manufacturer: Bluestar Welding	Manufacturer Serial #: BSFGS230
Year Built: 2004	National Board #: None
Alberta Registration #: None	Canadian Registration #: OH 6510.2

Reason for Inspection: Scheduled API-510 External Inspection

Condition of Nameplate and/or Bracket: Nameplate is intact and legible. The nameplate bracket is securely attached.

Internal Access?: No.

Corrosion Monitoring Locations (CMLs) and baseline thickness data established?: Yes.

Grounding Device in Place and Secure?: Yes. The equipment is grounded through the skid. The skid ground wire is attached and secure.

Condition of Foundation and Anchor Bolts: Anchor bolts are in place and secure. All (4) anchor bolt nuts are in place and secure.

Condition of Steel Supports, Saddles, and Bolting: All support structural welds appear sound.

Condition of Paint and/or Insulation: The paint is in acceptable condition with minor localized chipping and peeling.

Condition of Nozzles, Flanges, Repads, and Weepholes: All threaded connections. There is no evidence of leaks at any of the threaded connections.

Condition of Welds; Head and Shell Metal Surfaces: All (exposed) metal surfaces are painted. There is no distortion or indication of corrosion beneath the paint coating. The pressure boundary welds have no visual weld defects. Paint has minor chipping.

Condition of Ladders, Stairways, and Brackets: N/A

If Equipment has Anomalous Data, did the Inspector check it?: N/A

Is There a PSV on the Vessel?: Yes

If Yes, is it set at or below the MAWP?: Yes **Setting** 150 psi

Date PSV last tested (if there is a tag on the valve): 06/19/2015

Comments:

Recommendations:

Repairs Needed:

Robert W. Menke/JWW

API 510 Inspector Signature

0131

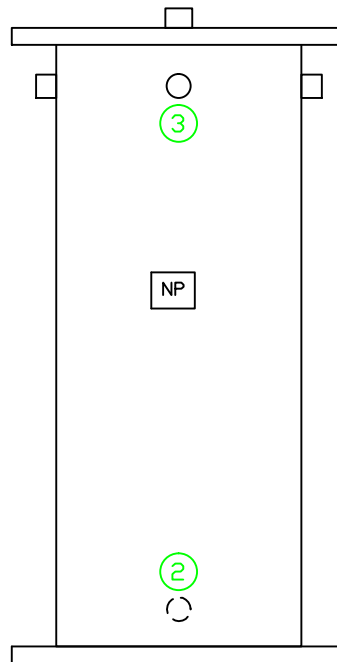
API 510 Inspector Number

02/14/2016

Date

EQUIP RETIREMENT DATE: 6/11/2043
NEXT INSPECTION IS DUE: 2/13/2017

#2. 01- SH-FRONT 0. 320 TC
#2. 02- SH-LEFT 0. 318 TC
#2. 03- SH-BACK 0. 319 TC
#2. 04- SH-RIGHT 0. 317 TC
#3. 01- SH-FRONT 0. 313 TC
#3. 02- SH-LEFT 0. 319 TC
#3. 03- SH-BACK 0. 312 TC
#3. 04- SH-RIGHT 0. 318 TC



N1		N13	
N2		N14	
N3		N15	
N4		N16	
N5		N17	
N6		N18	
N7		N19	
N8		N20	
N9		N21	
N10		N22	
N11		N23	
N12		N24	

TC-560

NAMEPLATE INFO	
MFG	BLUESTAR WELDING
SERIAL NUMBER	BSFGS230
NATIONAL BOARD #	NONE
DATE BUILT	2004
DESIGN P & T	150 PSI @ 100°F
NOTE	NO "U" STAMP CRN DH-6510. 2

CAL BLK=47°F

VESSEL=38°F

BUSINESS UNIT	FMC TECHNOLOGIES COMPLETION
EQ/CIRC ID #	LH0010-FGS-2
EQUIP NAME	FUEL GAS SCRUBBER
LOCATION	ON LINE HEATER LH-0010
DWG #	LH0010-FGS-2

DESC: FUEL GAS SCRUBBER ON LH-0010
DWG#: LH0010-FGS-2-2.01-3.04

Corrosion Monitoring Eq/Circ ID Analysis Report

Eaton Inspection Services
 1595 So Hwy 150, Suite F, Evanston, WY 82930
 Phone 307-789-3540 FAX 307-789-2822

Report Date:06/27/2016

(Report in inches, Corrosion Rates in MPY)
 Analysis: Straight Line

Unit: LH-0010
 Eq/Circ ID: LH0010-FGS-2
 Eq Type: VESSEL
 Class:
 CM RBI:
 Design Code: S8/D1

Flange Rating: 285 lb/in²
 Design Pressure: 150 lb/in²
 Design Temperature: 100 °F

Description: FUEL GAS SCRUBBER ON LH0010, SN:BSFGS230
 (8.625" PIPE)-FLAT HEADS, SHELL UT ONLY

Summary: Group Name:
 Insp. Due Date = 02/13/2017
 Pred. Ret. Date = 06/11/2043

Group Description:
 RCR = 0.1 MPY
 Rem. Life (from last survey 02/14/2016) = 27.3 yrs

0 C.A. Status: NO
 Total Caution TMLs = 0

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
2.01	SH-FRONT	N *	0.324 TC	09/11/2009	0.319 TC	03/10/2014	0.320 TC	02/14/2016	0	0.6	0.1	3.5	0.282 U	0.6	06/16/2079	02/13/2017
2.02	SH-LEFT	N	0.320 TC	09/11/2009	0.302 TC	03/10/2014	0.318 TC	02/14/2016	0	0.3	0.6	4.7	0.282 U	0.3	02/15/2136	02/13/2017
2.03	SH-BACK	N *	0.328 TC	09/11/2009	0.304 TC	03/10/2014	0.319 TC	02/14/2016	0	1.4	1.8	10.4	0.282 U	1.4	07/20/2042	02/13/2017
2.04	SH-RIGHT	N	0.319 TC	09/11/2009	0.315 TC	03/10/2014	0.317 TC	02/14/2016	0	0.3	0	3.8	0.282 U	0.3	10/16/2132	02/13/2017
3.01	SH-FRONT	N *	0.325 TC	09/11/2009	0.317 TC	03/10/2014	0.313 TC	02/14/2016	2.1	1.9	1.0	5.2	0.282 U	2.1	11/19/2030	02/13/2017
3.02	SH-LEFT	N *	0.331 TC	09/11/2009	0.317 TC	03/10/2014	0.319 TC	02/14/2016	0	1.9	1.9	3.8	0.282 U	1.9	08/06/2035	02/13/2017
3.03	SH-BACK	N *	0.321 TC	09/11/2009	0.315 TC	03/10/2014	0.312 TC	02/14/2016	1.6	1.4	1.0	3.0	0.282 U	1.6	11/14/2034	02/13/2017
3.04	SH-RIGHT	N *	0.329 TC	09/11/2009	0.319 TC	03/10/2014	0.318 TC	02/14/2016	0.5	1.7	1.3	5.1	0.282 U	1.7	04/19/2037	02/13/2017

Eaton Inspection Services
1595 So Hwy 150, Suite F, Evanston, WY 82930
Phone 307-789-3540 FAX 307-789-2822

Report Date: 06/27/2016

(Report in Inches, Corrosion Rates in MPY)
Analysis: Straight Line

Unit: LH-0010
Eq/Circ ID: LH0010-FGS-2
Design Code: S8/D1
Eq Type: VESSEL
Class:
CM RBI:

Flange Rating: 285 lb/in²
Design Pressure: 150 lb/in²
Design Temperature: 100 °F

Description: FUEL GAS SCRUBBER ON LH0010, SN:BSFGS230
(8.625" PIPE)-FLAT HEADS, SHELL UT ONLY

TML Corrosion Rates are each the Maximum of:

(A) -- Calculated Corrosion Rates x 1.00	:	Varies
(B) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate is the Maximum of:

(A) -- Average Corrosion Rate x 1.10	:	Not Used.
(B) -- Average Max 25.0% of TMLs, Min of 2	:	Not Used.
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	Not Used.
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 0.1 MPY

TML thickness readings have not been compensated for high Temperatures.
TML thickness readings have not been compensated for growths.

TML Life calculations are based on the Representative TML Corrosion Rate using Short
Term and Long Term Corrosion Rates.

Nominal thickness is used for TML corrosion rate calculations with less than 3 surveys.

Minimum time between inspections required for corrosion rate calculation is 3 months.

TML Inspection Interval is:
(A) -- 1.00 years.

Eq/Circ ID Last Survey Date is based on the LAST of the last 0% of TML survey dates (Min 1).

Eq/Circ ID Estimated life = 27.3 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 25% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 06/11/2043

Recommended Eq/Circ UT/RT Inspection Date is 02/13/2017
UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
There are 0 Caution TMLs in this Eq/Circ ID.

API 570 Piping External Inspection

Company Name: FMC Technologies Completion	Facility Name: Grand Junction
Line Name/Number: Associated Piping With LH-0010	
Size/Sched. Of Pipe: 3.5"	Eq/Circ. ID:
Service/System:	Piping Class <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> Other
Design Pressure: 1000 psi	Materials: <input checked="" type="checkbox"/> CS <input type="checkbox"/> SS <input type="checkbox"/> Other
Design Temperature: 180°	Note Stamping (If Any)
P&ID#:	Flange Rating:

Reason for Inspection: ☐ Initial API-570 on Stream Inspection.

☒ Scheduled API-570 External Inspection. ☐ Other:

Testing Performed:

☒ Visual ☒ UT ☐ PT ☐ MT ☐ Other:

Comments:

Insulation Observations:	Comments:
<input type="checkbox"/> Serviceable <input checked="" type="checkbox"/> Not Insulated <input type="checkbox"/> Missing/Damaged <input type="checkbox"/> CUI Identification <input type="checkbox"/> Corrosion Present (Describe) <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Issues	Piping is not insulated.

Coating Condition:	Comments:
<input checked="" type="checkbox"/> Good <input checked="" type="checkbox"/> Fair, Some Blistering/Peeling <input type="checkbox"/> Corrosion Present (Describe) <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Issues	Coating has minor peeling.

Loss of Containment:	Comments:
<input type="checkbox"/> Fluid Loss (Indicate How Much) <input type="checkbox"/> Seeping or Evidence of Past Leakage <input type="checkbox"/> Dripping (Size of Drops/Drops Per Minute) <input type="checkbox"/> Leaking (Size of Stream, Noise Level, etc.) <input type="checkbox"/> Clamps <input type="checkbox"/> Other <input checked="" type="checkbox"/> None Identified	There are no visible leaks.

Condition of Welds:	Comments:
<input checked="" type="checkbox"/> Welds Are Full, Smooth and Well Profiled <input type="checkbox"/> Incomplete Fusion/Penetration <input type="checkbox"/> Crack Located Near Weld Seam <input type="checkbox"/> Weld Does Not Appear to Be Original <input type="checkbox"/> Joints-Misaligned <input type="checkbox"/> Undercut <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Issues	Welds are full with a good weld profile. There are no visual issues.

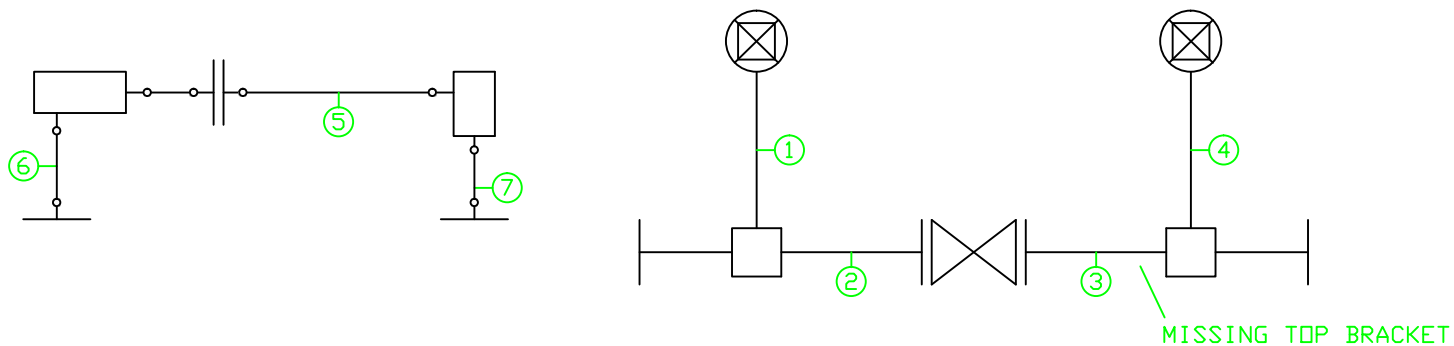
Relief Device:	Comments:
<input type="checkbox"/> PSV <input checked="" type="checkbox"/> No PSV <input type="checkbox"/> Rupture Disk <input type="checkbox"/> Atmospheric <input type="checkbox"/> No Relief Device Identified For This Equipment <input type="checkbox"/> Tag Secure and Legible <input type="checkbox"/> Set Pressure At Or Below MAWP <input type="checkbox"/> Block Valve Not Locked/Car Sealed In Open Position <input type="checkbox"/> Improper Drain Hole/Weather Cap On Atmos. Discharge <input type="checkbox"/> Obstruction (i.e. Debris) <input type="checkbox"/> Relief Installed In A Position Other Than Horiz. Or Upright <input checked="" type="checkbox"/> Other <input checked="" type="checkbox"/> No Issues	There is no PSV.

Supports/Hangers:	Comments:
<input checked="" type="checkbox"/> In Serviceable Condition <input type="checkbox"/> Foundation Is Damaged <input type="checkbox"/> Additional Support Needed <input type="checkbox"/> Hanger/Support Is Distorted/Broken/Missing <input type="checkbox"/> Pipe Slide Or Shoe Is Off Of The Support <input type="checkbox"/> Makeshift Support <input type="checkbox"/> Loose Support Needed To Be Tightened <input type="checkbox"/> Fireproofing Missing Or Damaged <input type="checkbox"/> Support/Hanger Is Corroded <input checked="" type="checkbox"/> Other <input checked="" type="checkbox"/> No Issues	Supports are in good condition. There is a top bracket missing.

Flanged Connections:	Comments:
<input checked="" type="checkbox"/> Bolting Serviceable <input type="checkbox"/> Short, Missing Or Damaged Bolting <input type="checkbox"/> Nuts Lack Full Engagement <input checked="" type="checkbox"/> Flanges Serviceable <input type="checkbox"/> Flange Material Or Rating Inconsistent For System <input type="checkbox"/> Flanges Deformed Or Damaged <input type="checkbox"/> Corrosion Present (Describe) <input type="checkbox"/> Gaskets <input type="checkbox"/> Flange Rating Issues <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Issues	Flanges are in good condition. Bolts are fully engaged.

Mechanical Observations:	Comments:
<input type="checkbox"/> Deadleg <input type="checkbox"/> Damaged Flex Hose <input type="checkbox"/> Crack <input type="checkbox"/> Biological Growth <input type="checkbox"/> Threaded Exposed <input type="checkbox"/> Threaded Connections Not Seal Welded <input type="checkbox"/> Expansion Joint Issues <input type="checkbox"/> Low Point Without Drain <input type="checkbox"/> Open Ended <input type="checkbox"/> Vibration (Excessive) <input type="checkbox"/> Weephole <input type="checkbox"/> Other <input checked="" type="checkbox"/> No Issues	There are no mechanical issues.

EQUIP RETIREMENT DATE: 11/4/2062
NEXT INSPECTION IS DUE: 2/13/2017



#1. 01- STR-F 0.772 D5
#1. 02- STR-L 0.726 D5
#1. 03- STR-BK 0.718 D5
#1. 04- STR-R 0.731 D5
#2. 01- STR-T 0.783 D5
#2. 02- STR-L 0.757 D5
#2. 03- STR-BTM 0.715 D5

#2. 04- STR-R 0.779 D5
#3. 01- STR-T 0.766 D5
#3. 02- STR-L 0.745 D5
#3. 03- STR-BTM 0.743 D5
#3. 04- STR-R 0.747 D5
#4. 01- STR-F 0.751 D5
#4. 02- STR-L 0.752 D5

#4. 03- STR-BK 0.748 D5
#4. 04- STR-R 0.740 D5
#5. 01- STR-T 0.715 D5
#5. 02- STR-F 0.714 D5
#5. 03- STR-BTM 0.704 D5
#5. 04- STR-BK 0.727 D5
#6. 01- STR-F 0.740 D5

#6. 02- STR-L 0.749 D5
#6. 03- STR-BK 0.761 D5
#6. 04- STR-R 0.743 D5
#7. 01- STR-F 0.818 D5
#7. 02- STR-L 0.829 D5
#7. 03- STR-BK 0.819 D5
#7. 04- STR-R 0.831 D5

CAL BLK=41°F

PIPE=35°F

BUSINESS UNIT	FMC TECHNOLOGIES COMPLETION
EQ/CIRC ID #	LH0010-P
EQUIP NAME	LH0010-P
DWG #	LH0010

DA-512

DESC: ASSOCIATED PIPING ON LINE HEATER 3
DWG#: LH0010-P-1.01-7.04

Corrosion Monitoring Eq/Circ ID Analysis Report

Eaton Inspection Services
 1595 So Hwy 150, Suite F, Evanston, WY 82930
 Phone 307-789-3540 FAX 307-789-2822

Report Date: 06/27/2016

(Report in inches, Corrosion Rates in MPY)
 Analysis: Straight Line

Unit: LH-0010
 Eq/Circ ID: LH0010-P
 Eq Type: PIPING
 Class:
 CM RBI:
 Design Code: B31.3

Flange Rating: 5734 lb/in²
 Design Pressure: 10000 lb/in²
 Design Temperature: 180 °F

Description: ASSOCIATED PIPING ON LINE HEATER 3

Summary: Group Name: Group Description:
 Insp. Due Date = 02/13/2017 RCR = 10.4 MPY
 Pred. Ret. Date = 11/04/2062 Rem. Life (from last survey 02/14/2016) = 46.7 yrs

0 C.A. Status: NO
 Total Caution TMLs = 1

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
1.01	STR-F	N	0.767	06/17/2007	0.786	03/10/2014	0.772 D5	02/14/2016	7.2	0	0	7.2	0.260 P	7.2	03/19/2087	02/13/2017
1.02	STR-L	N *	0.753	09/11/2009	0.744	03/10/2014	0.726 D5	02/14/2016	9.3	4.2	4.1	9.3	0.260 P	9.3	03/19/2066	02/13/2017
1.03	STR-BK	N *	0.732	09/11/2009	0.739 RR	03/10/2014	0.718 D5	02/14/2016	10.9	2.2	1.4	10.9	0.260 P	10.9	02/15/2058	02/13/2017
1.04	STR-R	N	0.756	09/11/2009	0.742 RR	03/10/2014	0.731 D5	02/14/2016	5.7	3.9	4.1	8.6	0.260 P	5.7	09/23/2098	02/13/2017
2.01	STR-T	N	0.781	06/17/2007	0.760	03/10/2014	0.760 RR	02/14/2016	0	2.4	2.9	9.5	0.260 P	2.4	05/26/2224	02/13/2017
2.02	STR-L	N	0.746	09/11/2009	0.731 RR	03/10/2014	0.744 RR	02/14/2016	0	0.3	1.3	13.3	0.260 P	0.3	01/01/3629	02/13/2017
2.03	STR-BTM	Y *	0.750	09/11/2009	0.749 RR	03/10/2014	0.715 D5	02/14/2016	17.6	5.4	3.5	17.6	0.260 P	17.6	12/19/2041	02/13/2017
2.04	STR-R	N	0.780	09/11/2009	0.794	03/10/2014	0.779 D5	02/14/2016	7.8	0.2	0	7.8	0.260 P	7.8	08/22/2082	02/13/2017
3.01	STR-T	N	0.767	06/17/2007	0.763	03/10/2014	0.763 RR	02/14/2016	0	0.5	0.6	4.7	0.260 P	0.5	11/07/3021	02/13/2017
3.02	STR-L	N *	0.756	09/11/2009	0.760	03/10/2014	0.745 D5	02/14/2016	7.8	1.7	1.2	7.8	0.260 P	7.8	04/13/2078	02/13/2017
3.03	STR-BTM	N	0.753	09/11/2009	0.751 RR	03/10/2014	0.743 D5	02/14/2016	4.1	1.6	1.4	4.1	0.260 P	4.1	11/22/2133	02/13/2017
3.04	STR-R	N	0.756	09/11/2009	0.750 RR	03/10/2014	0.747 D5	02/14/2016	1.6	1.4	1.5	4.7	0.260 P	1.6	05/31/2320	02/13/2017
4.01	STR-F	N *	0.765	06/17/2007	0.766	03/10/2014	0.751 D5	02/14/2016	7.8	1.6	1.1	7.8	0.260 P	7.8	01/19/2079	02/13/2017
4.02	STR-L	N	0.760	09/11/2009	0.757	03/10/2014	0.752 D5	02/14/2016	2.6	1.2	0.1	6.0	0.260 P	2.6	04/20/2205	02/13/2017
4.03	STR-BK	N	0.760	09/11/2009	0.730 RR	03/10/2014	0.737 RR	02/14/2016	0	3.6	4.5	19.0	0.260 P	3.6	08/01/2148	02/13/2017
4.04	STR-R	N	0.755	09/11/2009	0.741 RR	03/10/2014	0.740 D5	02/14/2016	0.5	2.3	2.5	8.6	0.260 P	2.3	10/04/2224	02/13/2017
5.01	STR-T	N	0.724	06/17/2007	0.715 RR	03/10/2014	0.715 D5	02/14/2016	0	1.0	0	3.3	0.260 P	1.0	12/26/2470	02/13/2017
5.02	STR-F	N	0.726	09/11/2009	0.724 RR	03/10/2014	0.714 D5	02/14/2016	5.2	1.9	1.5	5.2	0.260 P	5.2	05/28/2103	02/13/2017
5.03	STR-BTM	N *	0.725	09/11/2009	0.727 RR	03/10/2014	0.704 D5	02/14/2016	11.9	3.3	2.6	11.9	0.260 P	11.9	06/02/2053	02/13/2017
5.04	STR-BK	N	0.715	09/11/2009	0.705 RR	03/10/2014	0.727 D5	02/14/2016	0	0	0	7.5	0.260 P	0.1	02/29/4016	02/13/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

Eaton Inspection Services
 1595 So Hwy 150, Suite F, Evanston, WY 82930
 Phone 307-789-3540 FAX 307-789-2822

Report Date: 06/27/2016

(Report in Inches, Corrosion Rates in MPY)
 Analysis: Straight Line

Unit: LH-0010
 Eq/Circ ID: LH0010-P
 Eq Type: PIPING
 Class:
 CM RBI:
 Design Code: B31.3

Flange Rating: 5734 lb/in²
 Design Pressure: 10000 lb/in²
 Design Temperature: 180 °F

Description: ASSOCIATED PIPING ON LINE HEATER 3

Summary: Group Name: Group Description:
 Insp. Due Date = 02/13/2017 RCR = 10.4 MPY
 Pred. Ret. Date = 11/04/2062 Rem. Life (from last survey 02/14/2016) = 46.7 yrs

0 C.A. Status: No
 Total Caution TMLs = 1

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
6.01	STR-F	N	0.757	06/17/2007	0.743	03/10/2014	0.740 D5	02/14/2016	1.6	2.0	2.3	5.7	0.260 P	2.0	01/20/2256	02/13/2017
6.02	STR-L	N	0.745	09/11/2009	0.741 RR	03/10/2014	0.749 D5	02/14/2016	0	0	0	3.0	0.260 P	0.1	02/29/4016	02/13/2017
6.03	STR-BK	N	0.761	09/11/2009	0.756 RR	03/10/2014	0.761 D5	02/14/2016	0	0	0	3.7	0.260 P	0.1	02/29/4016	02/13/2017
6.04	STR-R	N	0.742	09/11/2009	0.749	03/10/2014	0.743 D5	02/14/2016	3.1	0	0	3.1	0.260 P	3.1	11/19/2171	02/13/2017
7.01	STR-F	N	0.749	06/17/2007	0.736 RR	03/10/2014	0.818 D5	02/14/2016	0	0	0	7.5	0.260 P	0.1	02/29/4016	02/13/2017
7.02	STR-L	N	0.747	09/11/2009	0.748 RR	03/10/2014	0.829 D5	02/14/2016	0	0	0	2.2	0.260 P	0.1	02/29/4016	02/13/2017
7.03	STR-BK	N	0.735	09/11/2009	0.761 RR	03/10/2014	0.819 D5	02/14/2016	0	0	0	0	0.260 P	0.1	02/29/4016	02/13/2017
7.04	STR-R	N	0.760	09/11/2009	0.762 RR	03/10/2014	0.831 D5	02/14/2016	0	0	0	0.4	0.260 P	0.1	02/29/4016	02/13/2017

Eaton Inspection Services
1595 So Hwy 150, Suite F, Evanston, WY 82930
Phone 307-789-3540 FAX 307-789-2822

Report Date: 06/27/2016

(Report in Inches, Corrosion Rates in MPY)
Analysis: Straight Line

Flange Rating: 5734 lb/in²
Design Pressure: 10000 lb/in²
Design Temperature: 180 °F

Unit: LH-0010
Eq/Circ ID: LH0010-P
Design Code: B31.3
Eq Type: PIPING
Class:
CM RBI:

Description: ASSOCIATED PIPING ON LINE HEATER 3

TML Corrosion Rates are each the Maximum of:

(A) -- Calculated Corrosion Rates x 1.00	:	Varies
(B) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate is the Maximum of:

(A) -- Average Corrosion Rate x 1.00	:	4.1 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	10.4 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	5.1 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 10.4 MPY

TML thickness readings have not been compensated for high Temperatures.
TML thickness readings have been compensated for growths.

TML Life calculations are based on the Representative TML Corrosion Rate using Short
Term and Long Term Corrosion Rates.

Nominal thickness is used for TML corrosion rate calculations with less than 3 surveys.

Minimum time between inspections required for corrosion rate calculation is 3 months.

TML Inspection Interval is:
(A) -- 1.00 years.

Eq/Circ ID Last Survey Date is based on the LAST of the last 0% of TML survey dates (Min 1).

Eq/Circ ID Estimated life = 46.7 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 11/04/2062

Recommended Eq/Circ UT/RT Inspection Date is 02/13/2017
UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
There are 1 Caution TMLs in this Eq/Circ ID.