



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

<b>Inspections Performed for:</b> FMC Technologies Completion	
<b>Inspection Report for:</b> LH-0033 – Coil 1	
<b>Remaining Life:</b> 4.1 YRS	<b>Date of this Report:</b> 09/11/2018
<b>Average Corrosion Rate:</b> 129.4 MPY	<b>Next UT:</b> 09/11/2019 <b>Next VT:</b> 09/11/2019
<b>Manufacturer:</b> DynaCorp Fabricators	<b>Mfg Serial #:</b> 6J111050
<b>Date Built:</b> 2012	<b>National Board #:</b> None
<b>Alberta registration #:</b> 617901	<b>Canadian Registration #:</b> T9862.2

**FMC Technologies Completion LH-0033 Line Heater**



# PRESSURE VESSEL INVENTORY

Code    Code-invalidated    Non-Code    Unknown    Code-Exempt

## VESSEL ID INFORMATION

Company Name : FMC Technologies Completion  
Facility/Location Name : PA District  
Field Name : N/A  
Equipment Number : LH-0033  
Eq/Circ. ID : LH0033-C1/ LH0033-C2  
Equipment Name/Service : LH0033 Line Heater (w/two coils)  
Physical Location : Canonsburg Yard  
GPS Coordinates :

## VESSEL DESCRIPTION AND SERVICE CONDITIONS

**Type of Vessel:** Horizontal Line Heater

**Vessel Size:** N/A Coils = 4.500"

**Operating Pressure Range (psig):**

**Operating Temperature Range (°F):**

**Does the vessel have Internal Access?** Yes No

**Specify type of internal access, if available:** When coils are removed (only internal access)

**Vessel is located:** Inside Outside Under Roof

**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? Yes No

Any stamping pertaining to materials of construction? Yes No

**\*\*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) \_\_\_\_\_

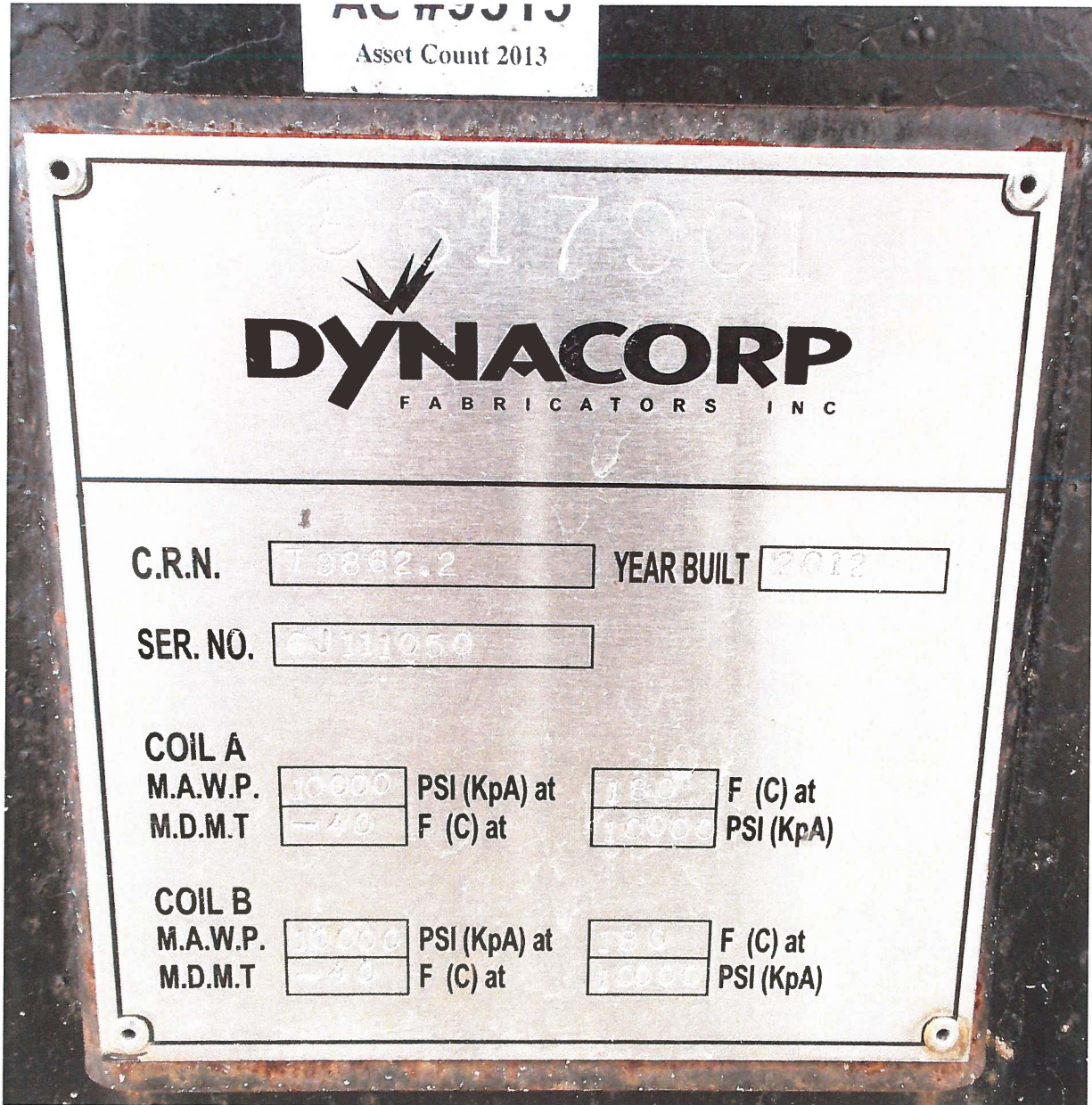
Approximate Date built or installed (check associated equipment or info at facility) \_\_\_\_\_

Any other pertinent information: \_\_\_\_\_

**ORIGINAL VESSEL NAMEPLATE/STAMPING INFORMATION**

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

**Nameplate Coils # 1 and Coils # 2**



## Coil #1 and Coil #2



### 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: Eric Crandall

Date: 08/27/2013

## API 510 PRESSURE VESSEL EXTERNAL INSPECTION

<b>Company Name:</b> FMC Technologies Completion	
<b>Facility/Location Name:</b> PA District	
<b>Equipment Number:</b> LH-0033	<b>Eq/Circ. ID:</b> LH0033 C1
<b>Equipment Name/Service:</b> Line Heater	
<b>Physical Location:</b> FMC Yard	
<b>Manufacturer:</b> DynaCorp Fabricators, INC	<b>Manufacturer Serial Number:</b> 6J111050
<b>Year Built:</b> 2012	<b>National Board Number:</b> None
<b>Alberta Registration #:</b> 617901	<b>Canadian Registration #</b> T9862.2

**Is Vessel in-service:** No.

**Reason for Inspection:** Scheduled API-510 External Inspection

**Condition of Nameplate and/or Bracket:** Nameplate is missing. May require an authorized inspector to install one.

**Internal Access:** Yes, with bundles pulled.

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

**Grounding Device in Place and Secure?:** N/A. The equipment is grounded through the skid. The line heater was not in service at the time of this inspection.

**Condition of Foundation and Anchor Bolts:** The front plate is warped with a bulge. Coating is missing on the upper right quarter. The remainder of the coating has mild surface corrosion.

**Condition of Steel Supports, Saddles, and Bolting:** All structural welds appear sound. Vessel is welded to baseplate.

**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:** Nozzles and flanges are in good condition. Crossover piping is in place with chipping and minor surface corrosion.

**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.

**Condition of Ladders, Stairways, and Brackets:** Access ladders and stairways are in acceptable condition.

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

**Is There a PSV on the Vessel?** No.

**If yes, is it set at or below the MAWP?**

**Date PSV last tested (if there is a tag on the valve):** N/A

**Comments:**

Piping is to be discarded.

**Recommendations:**

**Repairs Needed:**

*Mike York/MJW*

API 510 Inspector Signature

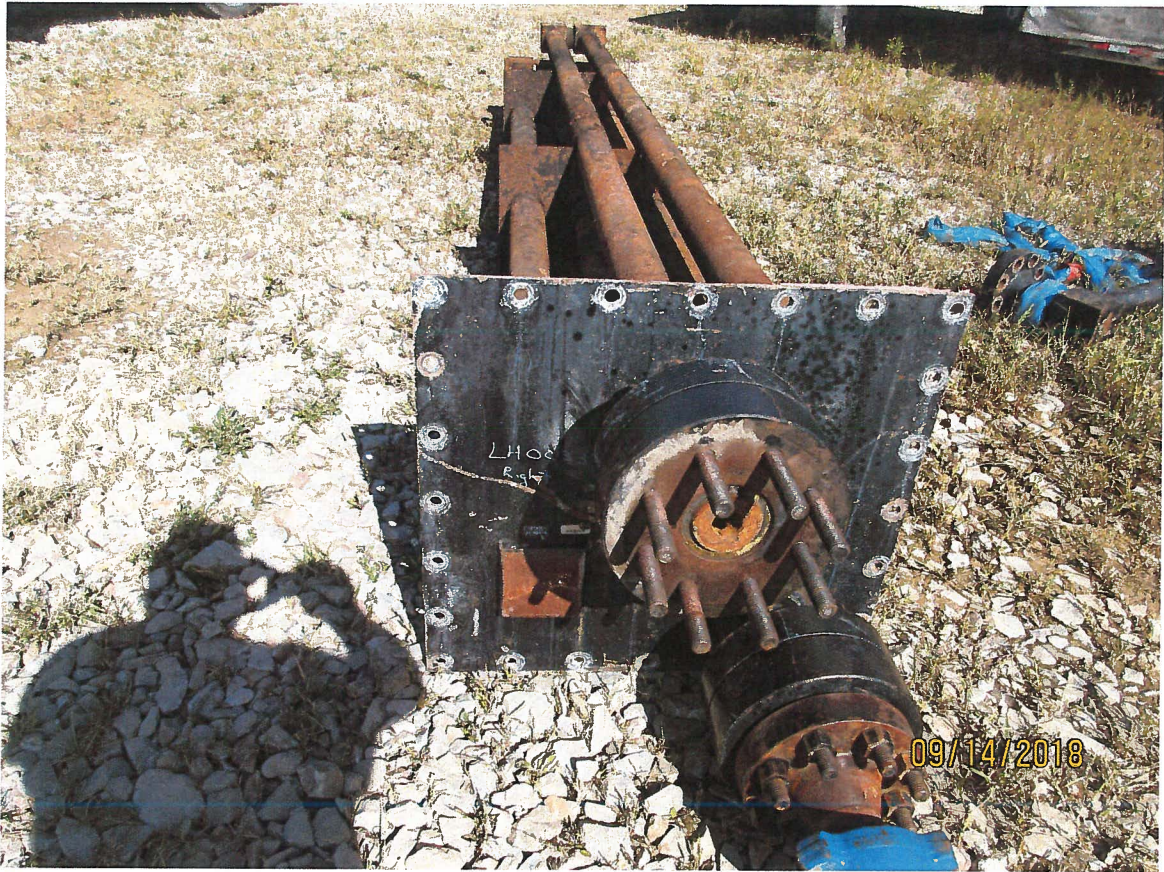
66475

API 510 Inspector Number

09/11/2018

Date

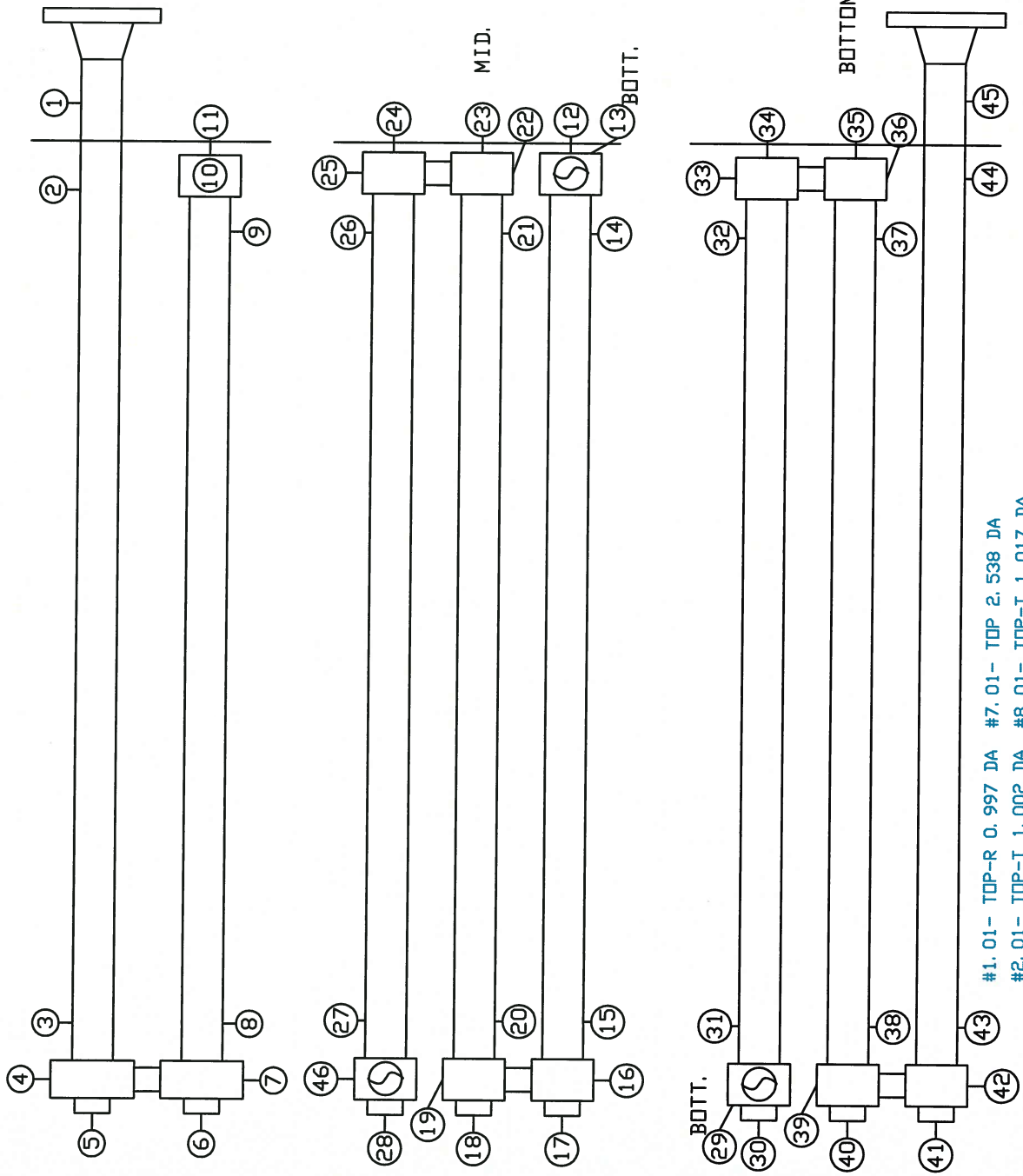








**EQUIP RETIREMENT DATE: 10/10/2022**  
**NEXT INSPECTION IS DUE: 9/11/2019**



TOP

MID.

BOTT.

BOTTOM

NAMEPLATE INFO	
MFG	DYNACORP
SERIAL NUMBER	6J111050
A NUMBER	617901
DATE BUILT	2012
DESIGN P & T	10,000 psi @ 180°F
NOTE	CRN # T9862-2

- DA-501
- #13.01- MID 0.000 NT #30.01- BTM 1.639 DA
  - #14.01- MID-T 1.018 DA #31.01- BTM 0.994 DA
  - #15.01- MID-R 0.965 DA #32.01- BTM-L 0.993 DA
  - #16.01- MID 1.634 DA #33.01- BTM 0.000 NT
  - #17.01- MID 2.513 DA #34.01- BTM 2.486 DA
  - #18.01- MID 1.663 DA #35.01- BTM 1.659 DA
  - #19.01- MID 0.000 NT #36.01- BTM 0.000 NT
  - #20.01- MID-L 1.038 DA #37.01- BTM 0.000 NT
  - #21.01- MID-L 1.009 DA **#38.01- BTM 0.000 NI**
  - #22.01- MID 0.000 NT #39.01- BTM 0.000 NT
  - #23.01- MID 2.507 DA #40.01- BTM 2.573 DA
  - #24.01- MID 1.603 DA **#41.01- BTM 1.622 DA**
  - #25.01- MID 2.539 DA #42.01- BTM 2.525 DA
  - #26.01- MID-T 0.984 DA #43.01- BTM-R 1.020 DA
  - #27.01- MID-L 1.019 DA **#44.01- BTM-T 0.985 DA**
  - #28.01- MID 1.661 DC** #45.01- BTM-L 1.009 DA
  - #29.01- BTM 2.552 DA #46.01- BTM 0.000 NT

CAL= 73°F PIPE= 75°F

BUSINESS UNIT	FMC TECHNOLOGIES COMPLETION
EQ/CIRC ID #	LH0033-C1
EQUIP NAME	LINE HEATER (WITH 2 COILS)
DWG #	LH0033-C1

- #1.01- TOP-R 0.997 DA #7.01- TOP 2.538 DA
- #2.01- TOP-T 1.002 DA #8.01- TOP-T 1.017 DA
- #3.01- TOP 1.031 DA #9.01- TOP-T 1.009 DA
- #4.01- TOP 1.668 DA** #10.01- TOP 1.637 DA
- #5.01- TOP 2.519 DC #11.01- TOP 0.000 NT
- #6.01- TOP 1.653 DA** #12.01- MID 0.000 NT

**DESC: COIL A ON LH-0033 LINE HTR; SN: 6J111050**  
**DWG#: LH0033-C1-1.01-46.01**

**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: 10/30/2018

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

Unit: LH-0033  
 Eq/Circ ID: LH0033-C1  
 Eq Type: PIPING  
 Class:  
 CM RBI:  
 Design Code: S8/D1

Flange Rating: 5734 lb/in<sup>2</sup>  
 Design Pressure: 10000 lb/in<sup>2</sup>  
 Design Temperature: 180 °F

Description: COIL A ON LINE HEATER; SN: 6J111050

Summary: Group Name: 09/11/2019  
 Insp. Due Date = 10/10/2022  
 Pred. Ret. Date =

Group Description:  
 RCR = 129.4 MPY  
 Rem. Life (from last survey 09/11/2018) = 4.1 yrs

0 C.A. Status: NO  
 Total Caution TMLs = 6

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	TOP-R	N	1.000 NM	06/15/2012	0.993 TC	11/11/2017	0.997 DA	09/11/2018	0	0.5	0.8	1.3	0.750 U	0.5	09/15/2512	09/11/2019
2.01	TOP-T	N	1.014	08/27/2013	0.962 TC	11/11/2017	1.002 DA	09/11/2018	0	2.4	5.6	12.4	0.750 U	2.4	09/12/2123	09/11/2019
3.01	TOP	N	0.987	08/27/2013	0.969 TC	11/11/2017	1.031 DA	09/11/2018	0	0	0	10.8	0.750 U	0.1	09/26/4018	09/11/2019
4.01	TOP	Y *	2.516	08/27/2013	1.586 TC	11/11/2017	1.668 DA	09/11/2018	0	168.2	185.4	221.0	1.000 U	168.2	09/01/2022	09/11/2019
5.01	TOP	N	1.369	08/27/2013	2.458 TC	11/11/2017	2.519 DA	09/11/2018	0	0	0	0	0.750 U	0.1	09/26/4018	09/11/2019
6.01	TOP	Y	1.757	08/27/2013	1.619 TC	11/11/2017	1.653 DA	09/11/2018	0	20.6	24.6	32.8	1.000 U	20.6	05/24/2050	09/11/2019
7.01	TOP	N	1.625	08/27/2013	2.451 TC	11/11/2017	2.538 DA	09/11/2018	0	0	0	0	1.000 U	0.1	09/26/4018	09/11/2019
8.01	TOP-T	N	1.018	08/27/2013	0.796 TC	11/11/2017	1.017 DA	09/11/2018	0	0.2	17.2	52.8	0.750 U	0.2	09/21/3353	09/11/2019
9.01	TOP-T	N	1.012	08/27/2013	0.956 TC	11/11/2017	1.009 DA	09/11/2018	0	0.6	4.7	13.3	0.750 U	0.6	05/15/2450	09/11/2019
10.01	TOP	N	1.653	08/27/2013	1.560 TC	11/11/2017	1.637 DA	09/11/2018	0	3.2	9.3	22.1	1.000 U	3.2	10/06/2217	09/11/2019
11.01	TOP	N	2.500 NM	06/15/2012	2.494	08/27/2013	2.476 TC	11/11/2017	4.3	4.4	4.4	5.0	1.000 U	4.4	04/29/2353	11/11/2018
12.01	MID	N	1.625 NM	06/15/2012	1.668	08/27/2013	1.630 TC	11/11/2017	9.0	0	1.7	9.0	1.000 U	9.0	11/11/2087	11/11/2018
13.01	MID	N	1.000 NM	06/15/2012		N/A	1.104	08/27/2013	N/A	0	N/A	0	0.750 U	0.1	09/11/4013	08/27/2014
14.01	MID-T	N	1.026	08/27/2013	0.964 TC	11/11/2017	1.018 DA	09/11/2018	0	1.6	5.9	0359.2	0.750 U	1.6	03/13/2186	09/11/2019
15.01	MID-R	N	0.997	08/27/2013	0.970 TC	11/11/2017	0.965 DA	09/11/2018	6.0	6.3	6.4	6.4	0.750 U	6.3	10/27/2052	09/11/2019
16.01	MID	N	1.618	08/27/2013	1.627 TC	11/11/2017	1.634 DA	09/11/2018	0	0	0	5.8	1.000 U	0.1	09/26/4018	09/11/2019
17.01	MID	N	2.496	08/27/2013	2.476 TC	11/11/2017	2.513 DA	09/11/2018	0	0	0	4.8	1.000 U	0.1	09/26/4018	09/11/2019
18.01	MID	N	1.617	08/27/2013	1.577 TC	11/11/2017	1.663 DA	09/11/2018	0	0	0	9.5	1.000 U	0.1	09/26/4018	09/11/2019
19.01	MID	N		N/A		N/A	1.625 NM	06/15/2012	N/A	N/A	N/A	0	1.000 U	0.1	06/30/4012	06/15/2013
20.01	MID-L	N	0.997	08/27/2013	0.970 TC	11/11/2017	1.038 DA	09/11/2018	0	0	0	6.4	0.750 U	0.1	09/26/4018	09/11/2019

**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: 10/30/2018

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

Unit: LH-0033  
Eq/Circ ID: LH0033-C1  
Eq Type: PIPING  
Class:  
CM RBI:  
Design Code: S8/D1

Flange Rating: 5734 lb/in<sup>2</sup>  
Design Pressure: 10000 lb/in<sup>2</sup>  
Design Temperature: 180 °F

Description: COIL A ON LINE HEATER; SN:6J111050

Summary: Group Name: Insp. Due Date = 09/11/2019  
Pred. Ret. Date = 10/10/2022

Group Description: RCR = 129.4 MPY  
Rem. Life (from last survey 09/11/2018) = 4.1 yrs

O C.A. Status: NO  
Total Caution TMLs = 6

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
21.01	MID-L	N	1.008	08/27/2013	0.950 TC	11/11/2017	1.009 DA	09/11/2018	0	0	4.3	13.8	0.750 U	0.1	09/26/4018	09/11/2019
22.01	MID	N	1.000 NM	06/15/2012		N/A	1.674	08/27/2013	N/A	0	N/A	0	0.750 U	0.1	09/11/4013	08/27/2014
23.01	MID	N	2.476	08/27/2013	2.462 TC	11/11/2017	2.507 DA	09/11/2018	0	0	0	20.0	1.000 U	0.1	09/26/4018	09/11/2019
24.01	MID	N	1.612	08/27/2013	1.591 TC	11/11/2017	1.603 DA	09/11/2018	0	1.8	2.8	10.8	1.000 U	1.8	09/14/2353	09/11/2019
25.01	MID	N	2.490	08/27/2013	2.455 TC	11/11/2017	2.539 DA	09/11/2018	0	0	0	8.3	0.750 U	0.1	09/26/4018	09/11/2019
26.01	MID-T	N	1.000	08/27/2013	0.955 TC	11/11/2017	0.994 DA	09/11/2018	0	3.2	5.6	10.7	0.750 U	3.2	10/27/2091	09/11/2019
27.01	MID-L	N	1.023	08/27/2013	0.973 TC	11/11/2017	1.019 DA	09/11/2018	0	0.8	4.4	11.9	0.750 U	0.8	12/14/2354	09/11/2019
28.01	MID	Y *	2.490	08/27/2013	2.479 TC	11/11/2017	1.661 DA	09/11/2018	982.8	164.5	112.0	982.8	1.000 U	982.8	05/15/2019	09/11/2019
29.01	BTM	N	1.625 NM	06/15/2012	2.457 TC	11/11/2017	2.552 DA	09/11/2018	0	0	0	0	1.000 U	0.1	09/26/4018	09/11/2019
30.01	BTM	N	1.629	08/27/2013	1.570 TC	11/11/2017	1.639 DA	09/11/2018	0	0	3.2	14.0	1.000 U	0.1	09/26/4018	09/11/2019
31.01	BTM	N	1.025	08/27/2013	0.955 TC	11/11/2017	0.994 DA	09/11/2018	0	6.2	9.6	16.6	0.750 U	6.2	01/18/2058	09/11/2019
32.01	BTM-L	N	1.003	08/27/2013	0.942 TC	11/11/2017	0.993 DA	09/11/2018	0	2.0	6.0	14.5	0.750 U	2.0	03/13/2140	09/11/2019
33.01	BTM	N	1.625 NM	06/15/2012	1.637	08/27/2013	1.616 TC	11/11/2017	5.0	1.7	2.5	5.0	1.000 U	5.0	01/24/2141	11/11/2018
34.01	BTM	N	2.511	08/27/2013	2.475 TC	11/11/2017	2.486 DA	09/11/2018	0	5.0	6.1	8.6	1.000 U	5.0	11/26/2315	09/11/2019
35.01	BTM	N	1.663	08/27/2013	1.622 TC	11/11/2017	1.659 DA	09/11/2018	0	0.8	3.7	9.7	1.000 U	0.8	06/18/2842	09/11/2019
36.01	BTM	N	2.500 NM	06/15/2012		N/A	2.535	08/27/2013	N/A	0	N/A	0	1.000 U	0.1	09/11/4013	08/27/2014
37.01	BTM	N *	1.000 NM	06/15/2012	1.007	08/27/2013	0.954 TC	11/11/2017	12.6	8.5	9.6	12.6	0.750 U	12.6	01/20/2034	11/11/2018
38.01	BTM	Y *	1.000 NM	06/15/2012	1.062	08/27/2013	0.955 TC	11/11/2017	25.4	8.3	12.8	25.4	0.750 U	25.4	12/07/2025	11/11/2018
39.01	BTM	N		N/A		N/A	1.000 NM	06/15/2012	N/A	N/A	N/A	0	0.750 U	0.1	06/30/4012	06/15/2013
40.01	BTM	N	1.742	08/27/2013	2.485 TC	11/11/2017	2.573 DA	09/11/2018	0	0	0	0	1.000 U	0.1	09/26/4018	09/11/2019
41.01	BTM	Y *	2.520	08/27/2013	1.642 TC	11/11/2017	1.622 DA	09/11/2018	24.0	178.2	188.0	208.6	1.000 U	178.2	03/09/2022	09/11/2019

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: 10/30/2018

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

Unit: LH-0033  
 Eq/Circ ID: LH0033-C1  
 Eq Type: PIPING  
 Class:  
 CM RBI:  
 Design Code: S8/D1

Flange Rating: 5734 lb/in<sup>2</sup>  
 Design Pressure: 10000 lb/in<sup>2</sup>  
 Design Temperature: 180 °F

Description: COIL A ON LINE HEATER; SN:6J1111050

Summary: Group Name: Group Description:  
 Insp. Due Date = 09/11/2019 RCR = 129.4 MPY  
 Pred. Ret. Date = 10/10/2022 Rem. Life (from last survey 09/11/2018) = 4.1 yrs

0 C.A. Status: No  
 Total Caution TMLs = 6

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
42.01	BTM	N	1.648	08/27/2013	2.487 TC	11/11/2017	2.525 DA	09/11/2018	0	0	0	0	1.000 U	0.1	09/26/4018	09/11/2019
43.01	BTM-R	N	0.996	08/27/2013	0.970 TC	11/11/2017	1.020 DA	09/11/2018	0	0	0	6.2	0.750 U	0.1	09/26/4018	09/11/2019
44.01	BTM-T	Y *	0.982	08/27/2013	0.987 TC	11/11/2017	0.985 DA	09/11/2018	2.4	0	0	236.5	1.000 U	2.4	06/11/2012	09/11/2019
45.01	BTM-L	N	1.034	08/27/2013	1.017 TC	11/11/2017	1.009 DA	09/11/2018	9.6	5.0	4.7	9.6	0.750 U	9.6	09/03/2045	09/11/2019
46.01	BTM	N	1.000 NM	06/15/2012		N/A	1.582 TC	11/11/2017	N/A	0	N/A	0	0.750 S	0.1	11/26/4017	11/11/2018

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: 10/30/2018

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

Unit: LH-0033  
Eq/Circ ID: LH0033-C1  
Design Code: S8/D1  
Eq Type: PIPING  
Class:  
CM RBI:

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

Description: COIL A ON LINE HEATER; SN:6J111050

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	:	31.6 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	129.4 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	37.6 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 129.4 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 = 4.1 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 10/10/2022

Recommended Eq/Circ UT/RT Inspection Date is 09/11/2019  
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 6 Caution TMLs in this Eq/Circ ID.



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

<b>Inspections Performed for:</b> FMC Technologies Completion	
<b>Inspection Report for:</b> LH-0033 – Coil 2	
<b>Remaining Life:</b> 20+ YRS	<b>Date of this Report:</b> 09/11/2018
<b>Average Corrosion Rate:</b> 17.3 MPY	<b>Next UT:</b> 09/11/2019 <b>Next VT:</b> 09/11/2019
<b>Manufacturer:</b> DynaCorp Fabricators	<b>Mfg Serial #:</b> 6J111050
<b>Date Built:</b> 2012	<b>National Board #:</b> None
<b>Alberta registration #:</b> 617901	<b>Canadian Registration #:</b> T9862.2

**FMC Technologies Completion LH-0033 Line Heater**



## PRESSURE VESSEL INVENTORY

Code    Code-invalidated    Non-Code    Unknown    Code-Exempt

### VESSEL ID INFORMATION

Company Name : FMC Technologies Completion  
Facility/Location Name : PA District  
Field Name : N/A  
Equipment Number : LH-0033  
Eq/Circ. ID : LH0033-C1/ **LH0033-C2**  
Equipment Name/Service : LH0033 Line Heater (w/two coils)  
Physical Location : Canonsburg Yard  
GPS Coordinates :

### VESSEL DESCRIPTION AND SERVICE CONDITIONS

**Type of Vessel:** Horizontal Line Heater

**Vessel Size:** N/A Coils = 4.500"

**Operating Pressure Range (psig):**

**Operating Temperature Range (°F):**

**Does the vessel have Internal Access?** Yes No

**Specify type of internal access, if available:** When coils are removed (only internal access)

**Vessel is located:** Inside Outside Under Roof

**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? Yes No

Any stamping pertaining to materials of construction? Yes No

**\*\*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) \_\_\_\_\_

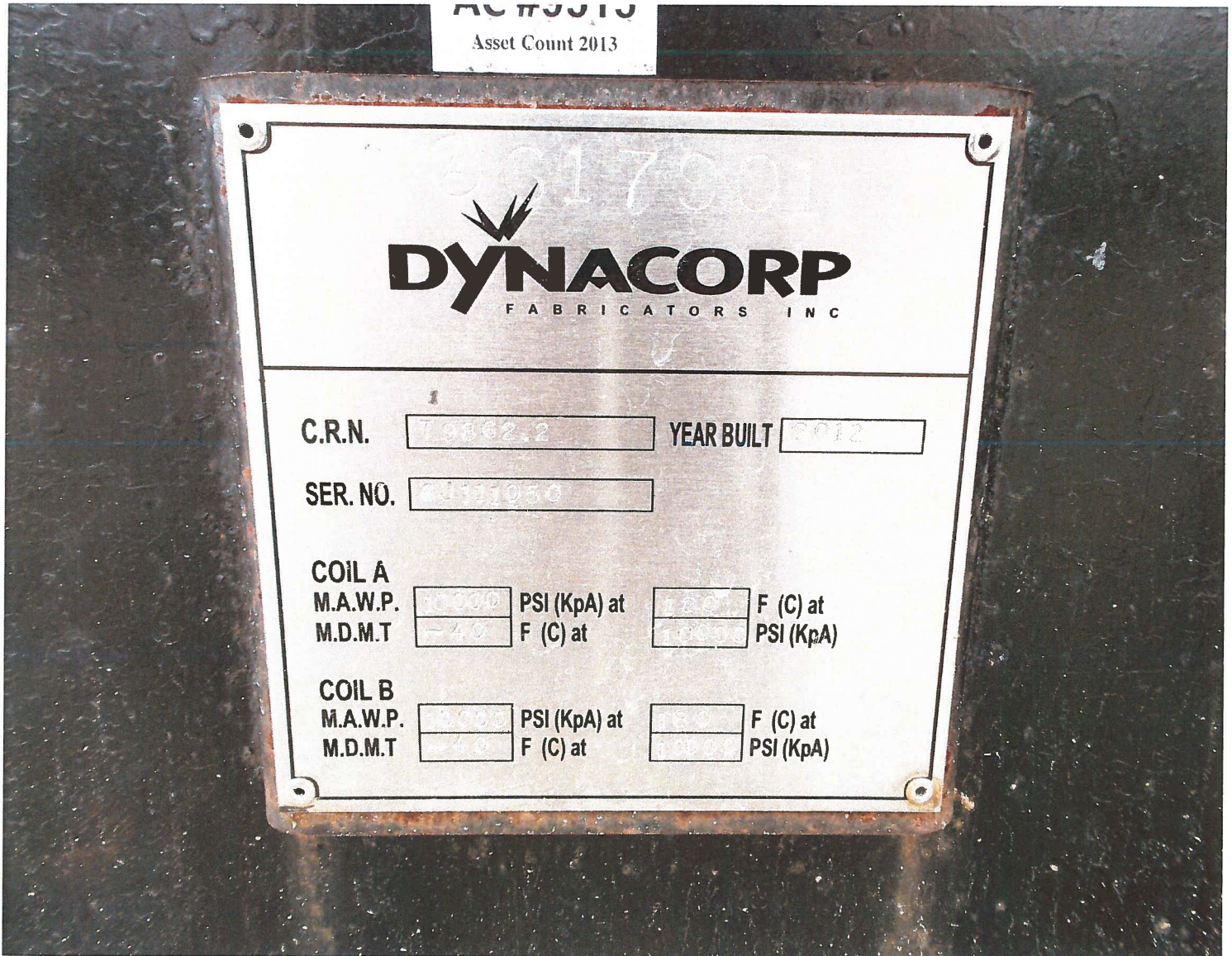
Any other pertinent information: \_\_\_\_\_



**ORIGINAL VESSEL NAMEPLATE/STAMPING INFORMATION**

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

**Nameplate Coils # 1 and Coils # 2**



## Coil # 1 and Coil # 2



### 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: Eric Crandall

Date: 08/27/2013

## API 510 PRESSURE VESSEL EXTERNAL INSPECTION

<b>Company Name:</b> FMC Technologies Completion	
<b>Facility/Location Name:</b> PA District	
<b>Equipment Number:</b> LH-0033	<b>Eq/Circ. ID:</b> LH0033-C2
<b>Equipment Name/Service:</b> Line Heater	
<b>Physical Location:</b> FMC Yard	
<b>Manufacturer:</b> DynaCorp Fabricators, INC	<b>Manufacturer Serial Number:</b> 6J111050
<b>Year Built:</b> 2012	<b>National Board Number:</b> None
<b>Alberta Registration #:</b> 617901	<b>Canadian Registration #</b> T9862.2

**Is Vessel in-service:** No.

**Reason for Inspection:** Scheduled API-510 External Inspection

**Condition of Nameplate and/or Bracket:** Nameplate is missing. May require an authorized inspector in install a replacement nameplate.

**Internal Access:** Yes, with bundles removed.

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

**Grounding Device in Place and Secure?:** N/A. The equipment is grounded through the skid. The line heater was not in service at the time of this inspection.

**Condition of Foundation and Anchor Bolts:** The front plate is dented in.

**Condition of Steel Supports, Saddles, and Bolting:** Angle iron supports have corrosion and scale build up.

**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:** Nozzles and flanges are acceptable with some chipping and minor surface corrosion present.

**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.

**Condition of Ladders, Stairways, and Brackets:** Access ladders and stairways are in acceptable condition.

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

**Is There a PSV on the Vessel?** No.

**If yes, is it set at or below the MAWP?**

**Date PSV last tested (if there is a tag on the valve):** N/A

**Comments:**

Piping is to be discarded.

**Recommendations:**

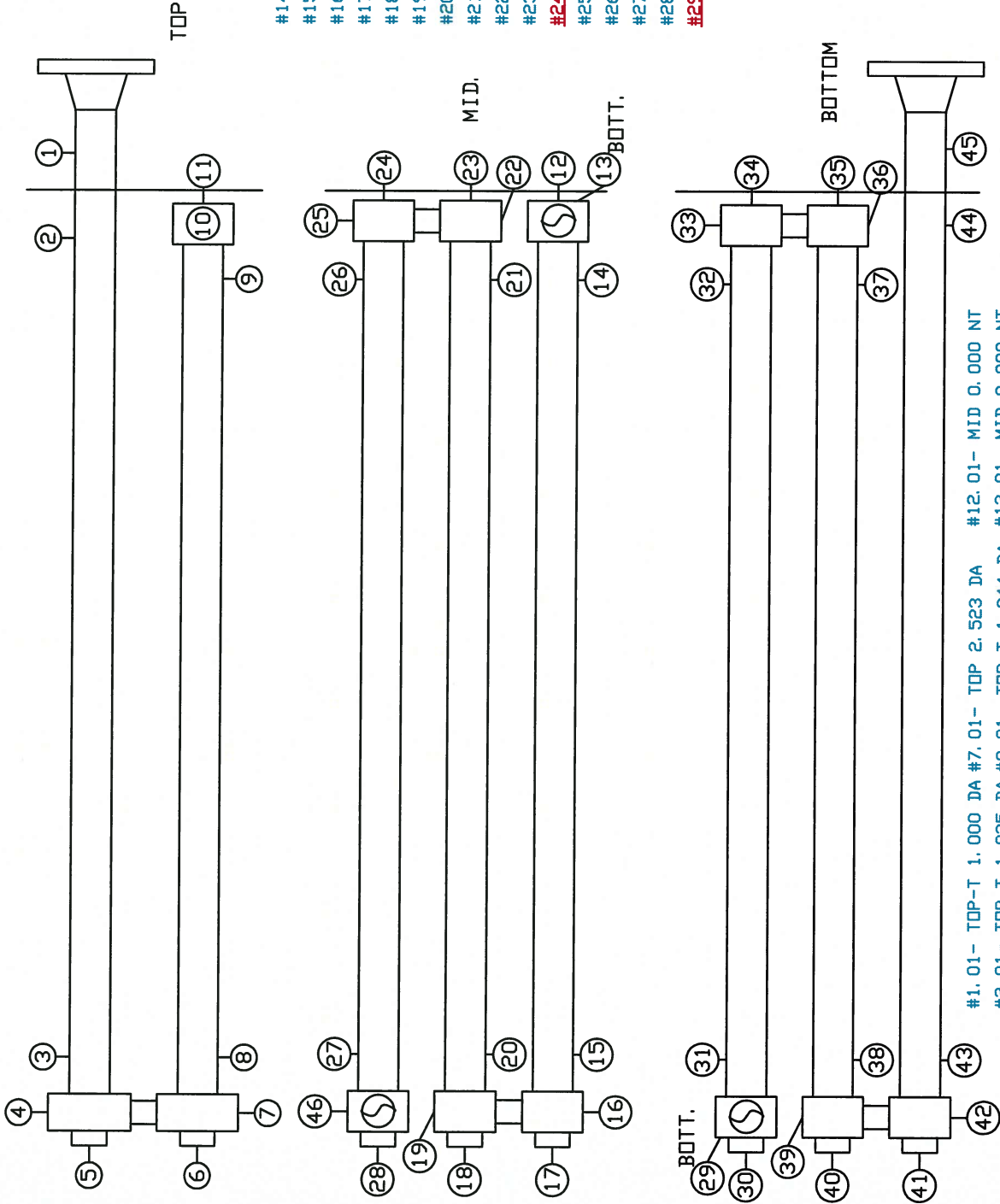
**Repairs Needed:**

*Robert W. Menke/MFW*  
**API 510 Inspector Signature**

66475  
**API 510 Inspector Number**

09/11/2018  
**Date**

**EQUIP RETIREMENT DATE: 12/23/2035**  
**NEXT INSPECTION IS DUE: 9/11/2019**



DA-501

- #14. 01- MID-L 1. 029 DA #30. 01- BTM 2. 483 DA
- #15. 01- MID-L 1. 012 DA #31. 01- BTM-R 1. 046 DA
- #16. 01- MID 2. 543 DA #32. 01- BTM-T 1. 000 DA
- #17. 01- MID 1. 668 DA #33. 01- BTM 2. 567 DA
- #18. 01- MID 2. 534 DA ~~#34. 01- BTM 1. 648 DA~~
- #19. 01- MID 0. 000 NT #35. 01- BTM 2. 520 DA
- #20. 01- MID-T 1. 036 DA #36. 01- BTM 0. 000 NT
- #21. 01- MID-R 1. 018 DA #37. 01- BTM 0. 000 NT
- #22. 01- MID 0. 000 NT ~~#38. 01- BTM 0. 000 NT~~
- #23. 01- MID 1. 620 DA #39. 01- BTM 0. 000 NT
- ~~#24. 01- MID 2. 509 DA~~ #40. 01- BTM 2. 505 DA
- #25. 01- MID 1. 657 DA ~~#41. 01- BTM 1. 652 DA~~
- #26. 01- MID-T 0. 985 DA #42. 01- BTM 2. 557 DA
- #27. 01- MID-T 1. 046 DA #43. 01- BTM-L 1. 027 DA
- #28. 01- MID 2. 515 DA #44. 01- BTM-T 1. 038 DA
- ~~#29. 01- BTM 1. 621 DA~~ #45. 01- BTM 0. 000 NT
- #46. 01- BTM 0. 000 NT

CAL= 73°F

PIPE= 75°F

BUSINESS UNIT	FMC TECHNOLOGIES
EG/CIRC ID #	LH0033-C2
EQUIP NAME	LINE HEATER (WITH 2 COILS)
DWG #	LH0033-C2

DESC: COIL B ON LH-0033 LINE HTR; SN: 6J111050

DWG#: LH0033-C2-1.01-46.01

- #1. 01- TOP-T 1. 000 DA #7. 01- TOP 2. 523 DA #12. 01- MID 0. 000 NT
- #2. 01- TOP-T 1. 025 DA #8. 01- TOP-T 1. 044 DA #13. 01- MID 0. 000 NT
- #3. 01- TOP-T 1. 039 DA #9. 01- TOP-T 1. 011 DA
- #4. 01- TOP 1. 640 DA #10. 01- TOP 2. 537 DA
- #5. 01- TOP 2. 532 DA #11. 01- TOP 0. 000 NT
- #6. 01- TOP 1. 664 DA

**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: 10/30/2018

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

Unit: LH-0033  
 Eq/Circ ID: LH0033-C2  
 Eq Type: PIPING  
 Class:  
 CM RBI:  
 Design Code: S8/D1

Flange Rating: 5734 lb/in<sup>2</sup>  
 Design Pressure: 10000 lb/in<sup>2</sup>  
 Design Temperature: 180 °F

Description: COIL B ON LINE HEATER; SN:6J111050

Summary: Group Name: Group Description:  
 Insp. Due Date = 09/11/2019 RCR = 29.1 MPY  
 Pred. Ret. Date = 12/23/2035 Rem. Life (from last survey 09/11/2018) = 17.3 Yrs

O C.A. Status: NO  
 Total Caution TMLs = 5

TM No	Location	Ctn	First Survey Thick	First Survey Nm	First Date	Previous Survey Thick	Previous Survey Nm	Previous Date	Last Survey Thick	Last Survey Nm	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TM Retirement Date	TM Inspection Date	
1.01	TOP-T	N	1.000	NM	06/15/2012	1.004	TC	11/11/2017	1.000	DA	09/11/2018	4.8		0	4.8	0.750	U	4.8	10/11/2070	09/11/2019
2.01	TOP-T	N	1.059		08/27/2013	0.976	TC	11/11/2017	1.025	DA	09/11/2018	0	6.7	11.0	19.7	0.750	U	6.7	09/28/2059	09/11/2019
3.01	TOP-T	N	1.008		08/27/2013	0.987	TC	11/11/2017	1.039	DA	09/11/2018	0	0	0	5.0	0.750	U	0.1	09/26/4018	09/11/2019
4.01	TOP	N	1.625		08/27/2013	1.588	TC	11/11/2017	1.640	DA	09/11/2018	0	0	0.8	8.8	1.000	U	0.1	09/26/4018	09/11/2019
5.01	TOP	N	2.469		08/27/2013	2.441	TC	11/11/2017	2.532	DA	09/11/2018	0	0	0	6.7	1.000	U	0.1	09/26/4018	09/11/2019
6.01	TOP	N	1.609		08/27/2013	1.607	TC	11/11/2017	1.664	DA	09/11/2018	0	0	0	13.3	1.000	U	0.1	09/26/4018	09/11/2019
7.01	TOP	N	2.516		08/27/2013	2.502	TC	11/11/2017	2.523	DA	09/11/2018	0	0	0.1	3.3	1.000	U	0.1	09/26/4018	09/11/2019
8.01	TOP-T	N	1.020		08/27/2013	0.966	TC	11/11/2017	1.044	DA	09/11/2018	0	0	0.9	12.8	0.750	U	0.1	09/26/4018	09/11/2019
9.01	TOP-T	N	1.016		08/27/2013	0.963	TC	11/11/2017	1.011	DA	09/11/2018	0	1.0	4.8	12.6	0.750	U	1.0	09/13/2279	09/11/2019
10.01	TOP	N	2.521		08/27/2013	2.501	TC	11/11/2017	2.537	DA	09/11/2018	0	0	0	4.8	1.000	U	0.1	09/26/4018	09/11/2019
11.01	TOP	N	1.625	NM	06/15/2012	1.640		08/27/2013	1.581	TC	11/11/2017	14.0	8.1	9.7	14.0	1.000	U	14.0	05/13/2059	11/11/2018
12.01	MID	N	2.500	NM	06/15/2012	2.501		08/27/2013	2.485	TC	11/11/2017	3.8	2.8	3.0	3.8	1.000	U	3.8	08/29/2408	11/11/2018
13.01	MID	N	1.625	NM	06/15/2012			N/A	1.759		08/27/2013	N/A	0	N/A	0	1.000	U	0.1	09/11/4013	08/27/2014
14.01	MID-L	N	1.014		08/27/2013	0.957	TC	11/11/2017	1.029	DA	09/11/2018	0	0	2.4	13.5	0.750	U	0.1	09/26/4018	09/11/2019
15.01	MID-L	N	0.983		08/27/2013	0.974	TC	11/11/2017	1.012	DA	09/11/2018	0	0	0	14.2	0.750	U	0.1	09/26/4018	09/11/2019
16.01	MID	N	2.523		08/27/2013	2.489	TC	11/11/2017	2.543	DA	09/11/2018	0	0	0	8.1	1.000	U	0.1	09/26/4018	09/11/2019
17.01	MID	N	1.623		08/27/2013	1.614	TC	11/11/2017	1.668	DA	09/11/2018	0	0	0	2.1	1.000	U	0.1	09/26/4018	09/11/2019
18.01	MID	N	2.459		08/27/2013	2.464	TC	11/11/2017	2.534	DA	09/11/2018	0	0	0	34.2	1.000	U	0.1	09/26/4018	09/11/2019
19.01	MID	N	1.625	NM	06/15/2012			N/A	1.620		08/27/2013	N/A	4.2	N/A	4.2	1.000	U	4.2	04/11/2161	08/27/2014
20.01	MID-T	N	1.037		08/27/2013	0.981	TC	11/11/2017	1.036	DA	09/11/2018	0	0.2	4.4	13.3	0.750	U	0.2	09/22/3448	09/11/2019

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: 10/30/2018

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

Unit: LH-0033  
 Eq/Circ ID: LH0033-C2  
 Eq Type: PIPING  
 Class:  
 CM RBI:  
 Design Code: S8/D1

Flange Rating: 5734 lb/in<sup>2</sup>  
 Design Pressure: 10000 lb/in<sup>2</sup>  
 Design Temperature: 180 °F

Description: COIL B ON LINE HEATER; SN:6J111050

Summary: Group Name: Group Description:  
 Insp. Due Date = 09/11/2019 RCR = 29.1 MPY  
 Pred. Ret. Date = 12/23/2035 Rem. Life (from last survey 09/11/2018) = 17.3 Yrs

O C.A. Status: NO  
 Total Caution TMLs = 5

TML No	Location	Ctn	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
21.01	MID-R	N	1.009	08/27/2013	0.969 TC	11/11/2017	1.018 DA	09/11/2018	0	0	1.9	9.5	0.750 U	0.1	09/26/4018	09/11/2019
22.01	MID	N		N/A		N/A	1.000 NM	06/15/2012	N/A	N/A	N/A	0	0.750 U	0.1	06/30/4012	06/15/2013
23.01	MID	N	1.662	08/27/2013	1.614 TC	11/11/2017	1.620 DA	09/11/2018	0	8.3	9.3	11.4	1.000 U	8.3	05/24/2093	09/11/2019
24.01	MID	Y	2.593	08/27/2013	2.490 TC	11/11/2017	2.509 DA	09/11/2018	0	16.7	19.2	24.5	1.000 U	16.7	01/21/2109	09/11/2019
25.01	MID	N	1.650	08/27/2013	1.572 TC	11/11/2017	1.657 DA	09/11/2018	0	0	5.1	18.5	1.000 U	0.1	09/26/4018	09/11/2019
26.01	MID-T	N	1.003	08/27/2013	0.942 TC	11/11/2017	0.985 DA	09/11/2018	0	3.6	7.1	14.5	0.750 U	3.6	12/22/2083	09/11/2019
27.01	MID-T	N	1.034	08/27/2013	0.986 TC	11/11/2017	1.046 DA	09/11/2018	0	0	2.1	11.4	0.750 U	0.1	09/26/4018	09/11/2019
28.01	MID	N	1.609	08/27/2013	1.604 TC	11/11/2017	2.515 DA	09/11/2018	0	0	0	13.3	1.000 U	0.1	09/26/4018	09/11/2019
29.01	BTM	Y *	1.893	08/27/2013	1.568 TC	11/11/2017	1.621 DA	09/11/2018	0	54.0	61.5	77.2	1.000 U	54.0	03/12/2030	09/11/2019
30.01	BTM	N	2.503	08/27/2013	2.486 TC	11/11/2017	2.483 DA	09/11/2018	3.6	4.0	4.0	4.0	1.000 U	4.0	06/14/2389	09/11/2019
31.01	BTM-R	N	1.002	08/27/2013	0.970 TC	11/11/2017	1.046 DA	09/11/2018	0	0	0	7.6	0.750 U	0.1	09/26/4018	09/11/2019
32.01	BTM-T	N	0.996	08/27/2013	0.964 TC	11/11/2017	1.000 DA	09/11/2018	0	0	1.9	7.6	0.750 U	0.1	09/26/4018	09/11/2019
33.01	BTM	N	2.494	08/27/2013	2.484 TC	11/11/2017	2.567 DA	09/11/2018	0	0	0	5.0	1.000 U	0.1	09/26/4018	09/11/2019
34.01	BTM	Y *	1.895	08/27/2013	1.602 TC	11/11/2017	1.648 DA	09/11/2018	0	49.0	55.7	69.6	1.000 U	49.0	12/02/2031	09/11/2019
35.01	BTM	N	2.520	08/27/2013	2.489 TC	11/11/2017	2.520 DA	09/11/2018	0	0	2.4	7.4	1.000 U	0.1	09/26/4018	09/11/2019
36.01	BTM	N	1.625 NM	06/15/2012		N/A	1.859	08/27/2013	N/A	0	N/A	0	1.000 U	0.1	09/11/4013	08/27/2014
37.01	BTM	N *	1.000 NM	06/15/2012	0.977	08/27/2013	0.965 TC	11/11/2017	2.9	6.5	5.5	19.2	0.750 U	6.5	12/09/2050	11/11/2018
38.01	BTM	Y *	1.000 NM	06/15/2012	1.039	08/27/2013	0.972 TC	11/11/2017	15.9	5.2	8.0	15.9	0.750 U	15.9	10/29/2031	11/11/2018
39.01	BTM	N		N/A		N/A	1.000 NM	06/15/2012	N/A	N/A	N/A	0	0.750 U	0.1	06/30/4012	06/15/2013
40.01	BTM	N	1.613	08/27/2013	2.475 TC	11/11/2017	2.505 DA	09/11/2018	0	0	0	10.0	1.000 U	0.1	09/26/4018	09/11/2019
41.01	BTM	Y *	2.500 NM	06/15/2012	1.610 TC	11/11/2017	1.652 DA	09/11/2018	0	135.9	146.2	212.9	1.000 U	135.9	06/29/2023	09/11/2019

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: 10/30/2018

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

Unit: LH-0033  
 Eq/Circ ID: LH0033-C2  
 Eq Type: PIPING  
 Class:  
 CM RBI:  
 Design Code: S8/D1

Flange Rating: 5734 lb/in<sup>2</sup>  
 Design Pressure: 10000 lb/in<sup>2</sup>  
 Design Temperature: 180 °F

Description: COIL B ON LINE HEATER; SN:6J111050

Summary: Group Name: Insp. Due Date = 09/11/2019 RCR = 29.1 MPY Group Description: 0 C.A. Status: NO  
 Pred. Ret. Date = 12/23/2035 Rem. Life (from last survey 09/11/2018) = 17.3 yrs Total Caution TMLs = 5

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
42.01	BTM	N	1.634	08/27/2013	2.467 TC	11/11/2017	2.557 DA	09/11/2018	0	0	0	0	1.000 U	0.1	09/26/4018	09/11/2019
43.01	BTM-L	N	1.030	08/27/2013	0.983 TC	11/11/2017	1.027 DA	09/11/2018	0	0.6	4.0	11.2	0.750 U	0.6	05/15/2480	09/11/2019
44.01	BTM-T	N	1.047	08/27/2013	0.979 TC	11/11/2017	1.038 DA	09/11/2018	0	1.8	6.4	16.2	0.750 U	1.8	09/12/2178	09/11/2019
45.01	BTM	N *	1.000 NM	06/15/2012	1.031	08/27/2013	0.996 TC	11/11/2017	8.3	0.7	2.7	8.3	0.750 U	8.3	07/02/2047	11/11/2018
46.01	BTM	N	1.000 NM	06/15/2012		N/A	2.492 TC	11/11/2017	N/A	0	N/A	0	0.750 U	0.1	11/26/4017	11/11/2018



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

Report Date: 10/30/2018

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

Unit: LH-0033  
Eq/Circ ID: LH0033-C2  
Design Code: S8/D1  
Eq Type: PIPING  
Class:  
CM RBI:

Flange Rating: 5734 lb/in<sup>2</sup>  
Design Pressure: 10000 lb/in<sup>2</sup>  
Design Temperature: 180 °F

Description: COIL B ON LINE HEATER; SN:6J111050

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 : 7.4 MPY  
(B) -- Average Max 25.0% of TMLs, Min of 2 : 29.1 MPY  
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 8.8 MPY  
(D) -- Default Corrosion Rate : 0.1 MPY  
Representative Corrosion Rate = 29.1 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 = 17.3 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 12/23/2035

Recommended Eq/Circ UT/RT Inspection Date is 09/11/2019  
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 5 Caution TMLs in this Eq/Circ ID.



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

<b>Inspections Performed for:</b> FMC Technologies Completion – PA District	
<b>Inspection Report for:</b> LH-0033 Fuel Gas Scrubber	
<b>Remaining Life:</b> 17.9 YRS	<b>Date of this Report:</b> 09/11/2018
<b>Representative Corrosion Rate:</b> 3.4 MPY	<b>Next UT:</b> 09/11/2019 <b>Next VT:</b> 09/11/2019
<b>Manufacturer:</b> LoTech Mfg.	<b>Mfg Serial #:</b> 1006.5889
<b>Date Built:</b> 2011	<b>National Board #:</b> None
<b>Alberta registration #:</b>	<b>Canadian Registration #:</b> OH7154.21345

**FMC Technologies Completion - LH-0033 Line Heater Fuel Gas Scrubber**



## PRESSURE VESSEL INVENTORY

Code     Code-invalidated     Non-Code     Unknown     Code-Exempt

### VESSEL ID INFORMATION

Company Name : Technip FMC  
Facility/Location Name : Pennsylvania District  
Field Name :  
Equipment Number : LH-0033  
Eq/Circ. ID : LH0033-FGS  
Equipment Name/Service : (Line Heater) Fuel Gas Scrubber  
Physical Location : On LH-0033 in FMC Yard  
GPS Coordinates :

### VESSEL DESCRIPTION AND SERVICE CONDITIONS

**Type of Vessel:** Vertical Fuel Gas Scrubber

**Vessel Size:** 6.625" O.D.

**Operating Pressure Range (psig):** Not in-service

**Operating Temperature Range (°F):** Not in-service

**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): 6.625 O.D.

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) 2011

Any other pertinent information: \_\_\_\_\_

# PRESSURE VESSEL INVENTORY

## ORIGINAL VESSEL NAMEPLATE/STAMPING INFORMATION

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



## SUPPLEMENTAL VESSEL NAMEPLATE/STAMPING INFORMATION

Repair stamp:  R stamp  Other Stamp  No stamp

Repaired By \_\_\_\_\_

Date of Repair \_\_\_\_\_

Nat'l Bd. R-Certification No. \_\_\_\_\_

Other Stamping Information: \_\_\_\_\_

## 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: Jeff Wall

Date: 11/11/2017

## API 510 PRESSURE VESSEL EXTERNAL INSPECTION REPORT

<b>Company Name:</b> FMC Technologies Completion	
<b>Field/Location:</b> PA District	
<b>Equipment Number:</b> LH-0033	<b>Eq/Circ. ID:</b> LH0033-FGS
<b>Equipment Name/Service:</b> Fuel Gas Scrubber	
<b>Physical Location:</b> In PA Yard	
<b>Manufacturer:</b> LoTech Mfg., Inc.	<b>Manufacturer Serial Number:</b> 1006.5889
<b>Year Built:</b> 2011	<b>National board #:</b> None
<b>Alberta Registration #:</b> None	<b>Canadian Registration # :</b> OH 7154.21345

**Is Vessel in-service?** No

**Reason for Inspection:** Initial API-510 on Stream 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?:** N/A. The equipment is grounded through the skid. The unit was not in service at the time of this inspection.

**Condition of Foundation and Anchor Bolts:** There are no anchor bolts. The vessel is welded to a baseplate which is welded to the skid deck/frame. Baseplate-to-deck/frame attachment welds appear sound. There is light peeling and moderate surface corrosion on the baseplate.

**Condition of Steel Supports, Saddles, and Bolting:** All support structural welds appear sound. Vessel is welded to baseplate. There is minor peeling and moderate surface corrosion.

**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.

**Condition of Ladders, Stairways, and Brackets:** N/A. Vessel sits in a steel box.

**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. 150 psi.

**Date PSV last tested (if there is a tag on the valve):** 01/2018 by Portersville.

**Comments:**

**Recommendations:**

**Repairs Needed:**

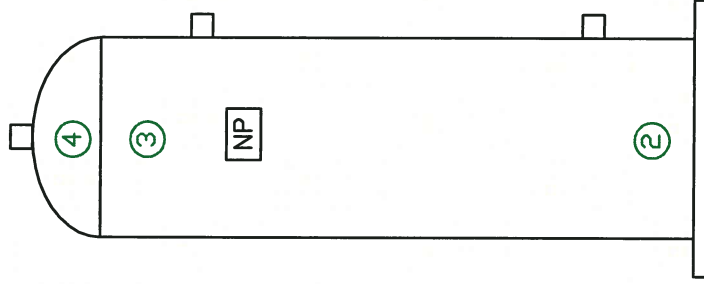
Robert W. Menke/MJW  
**API 510 Inspector Signature**

0131  
**API 510 Inspector Number**

09/11/2018  
**Date**

**EQUIP RETIREMENT DATE: 8/12/2036**  
**NEXT INSPECTION IS DUE: 9/11/2019**

- #2. 01- SH BTM - F 0. 279 FH
- #2. 02- SH BTM - L 0. 274 FH
- #2. 03- SH BTM - BK 0. 273 FH
- #2. 04- SH BTM - R 0. 280 FH
- #3. 01- SH TOP - F 0. 282 FH
- #3. 02- SH TOP - L 0. 292 FH
- #3. 03- SH TOP - BK 0. 283 FH
- #3. 04- SH TOP - R 0. 284 FH
- #4. 01- HD TOP - F 0. 284 FH
- #4. 02- HD TOP - L 0. 279 FH
- #4. 03- HD TOP - BK 0. 281 FH
- #4. 04- HD TOP - R 0. 281 FH



FH2E-D

**NAMEPLATE INFO**

MFG	LOTECH MANUFACTURING, INC.
SERIAL NUMBER	1006. 5889
NATIONAL BOARD #	NONE
DATE BUILT	2011
DESIGN P & T	150 PSIG @ 650°F
NOTE	CRN # DH 7154. 21345 NO 'U' STAMP

CAL BLK=73°F

VESSEL=75°F

BUSINESS UNIT	FMC TECHNOLOGIES COMPLETION
EQ/CIRC ID #	LH0033-FGS
EQUIP NAME	FUEL GAS SCRUBBER
LOCATION	WITH LINE HEATER LH-0033
DWG #	LH0033-FGS

**DESC: FUEL GAS SCRUBBER; SN:1006.5889**  
**DWG#: LH0033-FGS-2.01-4.04**

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: 10/29/2018

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

Unit: LH-0033  
 Eq/Circ ID: LH0033-FGS  
 Eq Type: PIPING  
 Class:  
 CM RBI:  
 Design Code: S8/D1

Flange Rating: 0 lb/in<sup>2</sup>  
 Design Pressure: 150 lb/in<sup>2</sup>  
 Design Temperature: 650 °F

Description: FUEL GAS SCRUBBER; SN:1006.5889

Summary: Group Name: Insp. Due Date = 09/11/2019  
 Pred. Ret. Date = 08/12/2036

Group Description:  
 RCR = 3.4 MPY  
 Rem. Life (from last survey 09/11/2018) = 17.9 Yrs

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

TML No	Location	Ctn	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 BTM - F	N	0.280 NM	06/01/2011	0.273 TC	11/11/2017	0.273 RR	09/11/2018	0	1.0	1.0	1.1	0.210 U	1.0	09/11/2081	09/11/2019
2.02	SH BTM - L	N *	0.280 NM	06/01/2011	0.260 TC	11/11/2017	0.260 RR	09/11/2018	0	2.7	2.9	3.1	0.210 S	2.7	03/19/2037	09/11/2019
2.03	SH BTM - BK	N	0.280 NM	06/01/2011	0.271 TC	11/11/2017	0.271 RR	09/11/2018	0	1.2	1.3	1.4	0.210 S	1.2	07/12/2069	09/11/2019
2.04	SH BTM - R	N	0.280 NM	06/01/2011	0.276 TC	11/11/2017	0.276 RR	09/11/2018	0	0.5	0.6	0.6	0.210 S	0.5	09/12/2150	09/11/2019
3.01	SH TOP - F	N *	0.280 NM	06/01/2011	0.267 TC	11/11/2017	0.267 RR	09/11/2018	0	1.8	1.9	2.0	0.210 S	1.8	05/12/2050	09/11/2019
3.02	SH TOP - L	N *	0.280 NM	06/01/2011	0.267 TC	11/11/2017	0.267 RR	09/11/2018	0	1.8	1.9	2.0	0.210 S	1.8	05/12/2050	09/11/2019
3.03	SH TOP - BK	N	0.280 NM	06/01/2011	0.278 TC	11/11/2017	0.278 RR	09/11/2018	0	0.3	0.3	0.3	0.210 S	0.3	05/14/2245	09/11/2019
3.04	SH TOP - R	N	0.280 NM	06/01/2011	0.277 TC	11/11/2017	0.277 RR	09/11/2018	0	0.4	0.4	0.5	0.210 S	0.4	03/13/2186	09/11/2019
4.01	HD TOP - F	N *	0.280 NM	06/01/2011	0.254 TC	11/11/2017	0.254 RR	09/11/2018	0	3.6	3.7	4.0	0.210 S	3.6	12/01/2030	09/11/2019
4.02	HD TOP - L	N *	0.280 NM	06/01/2011	0.254 TC	11/11/2017	0.254 RR	09/11/2018	0	3.6	3.7	4.0	0.210 S	3.6	12/01/2030	09/11/2019
4.03	HD TOP - BK	N *	0.280 NM	06/01/2011	0.258 TC	11/11/2017	0.258 RR	09/11/2018	0	3.0	3.2	3.4	0.210 S	3.0	09/11/2034	09/11/2019
4.04	HD TOP - R	N *	0.280 NM	06/01/2011	0.259 TC	11/11/2017	0.259 RR	09/11/2018	0	2.9	3.0	3.3	0.210 S	2.9	08/04/2035	09/11/2019



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: 10/29/2018

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

Unit: LH-0033  
Eq/Circ ID: LH0033-FGS  
Design Code: S8/DI  
Eq Type: PIPING  
Class:  
CM RBI:

Flange Rating: 0 lb/in<sup>2</sup>  
Design Pressure: 150 lb/in<sup>2</sup>  
Design Temperature: 650 °F  
Description: FUEL GAS SCRUBBER; SN:1006.5889

TML Corrosion Rates are each the Maximum of:  
(A) -- Calculated Corrosion Rates x 1.00 :  
(B) -- Default Corrosion Rate : 0.1 MPY

Representative Corrosion Rate is the Maximum of:  
(A) -- Average Corrosion Rate x 1.00 : 1.9 MPY  
(B) -- Average Max 25.0% of TMLs, Min of 2 : 3.4 MPY  
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 2.6 MPY  
(D) -- Default Corrosion Rate : 0.1 MPY  
Representative Corrosion Rate = 3.4 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 6 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 = 17.9 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 08/12/2036

Recommended Eq/Circ UT/RT Inspection Date is 09/11/2019  
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.