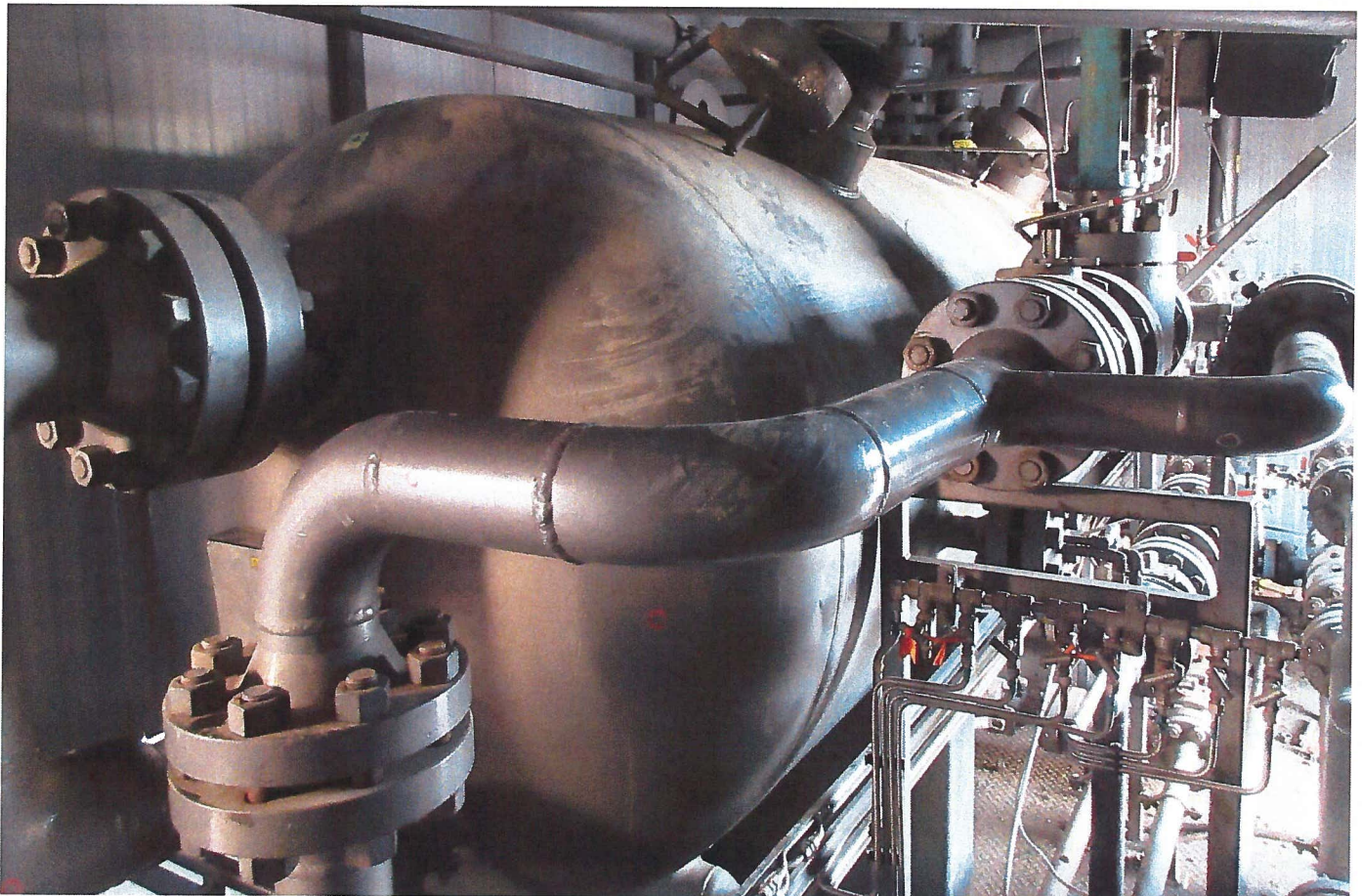




1595 So. Hwy 150, Suite F
Evanston, WY 82930

Inspections Performed for: FMC Technologies Completion – Grand Junction	
Inspection Report for: HS-0030 Separator	
Remaining Life: 20+ YRS	Date Last Inspected: 09/26/2018
Representative Corrosion Rate: 5.5 MPY	Next UT: 09/26/2019 Next VT: 09/26/2019
Manufacturer: Micoda Process Systems, Inc.	Manufacturer Serial #: 1256
Year Built: 2005	National Board #: 20
Alberta Registration #: 525009	Canadian Registration #: R9975.2

HS-0030 Separator



PRESSURE VESSEL INVENTORY FORM

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

VESSEL ID INFORMATION

Company Name : Pure Energy Services (USA) Inc.
Facility/Location Name : Wyoming District
Field Name :
Equipment Number : HS-0030
Eq/Circ. ID : HS0030-SEP
Equipment Name/Service : Separator
Physical Location :
GPS Coordinates :

VESSEL DESCRIPTION AND SERVICE CONDITIONS

Type of Vessel: Horizontal Separator

Vessel Size: 50"

Operating Pressure Range (psig): 2000 psi

Operating Temperature Range (°F): 200°

Does the vessel have Internal Access? Yes

Specify type of internal access, if available: Manway is located in the shell.

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)

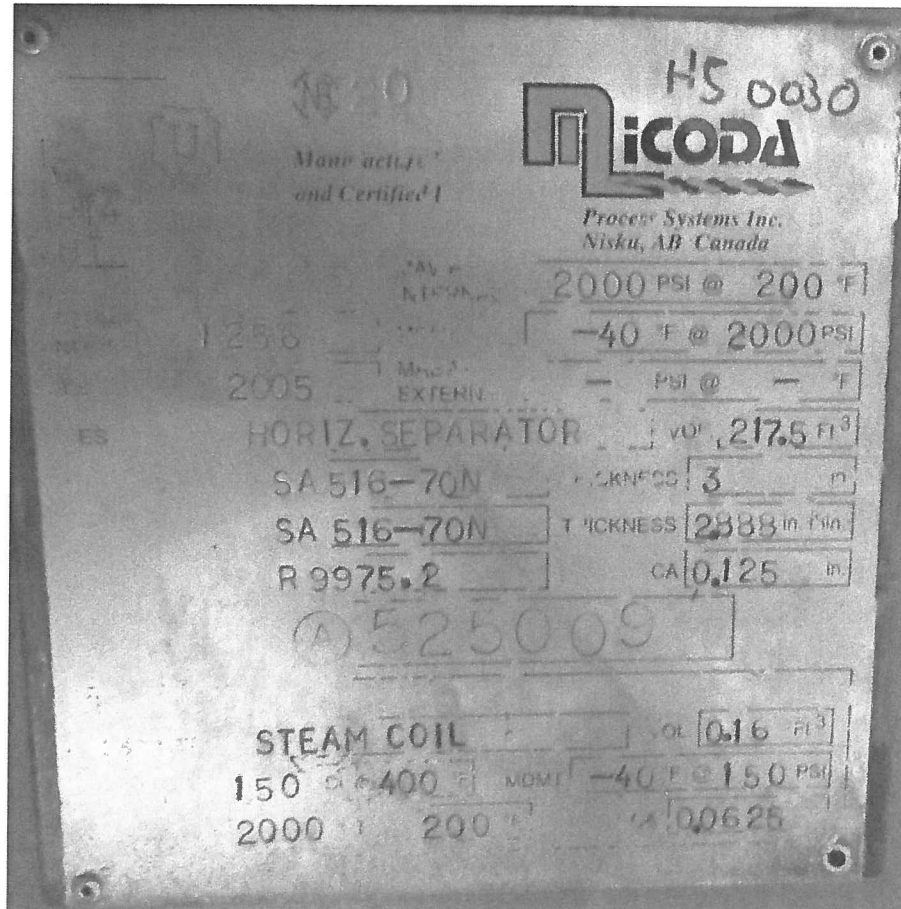
Approximate Date built or installed (check associated equipment or info at facility)

Any other pertinent information:

PRESSURE VESSEL INVENTORY FORM

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: Robert W. Menke

Date: 01/07/2013

*Revised 2/2016

API 510 PRESSURE VESSEL EXTERNAL INSPECTION REPORT

Company Name: FMC Technologies Completion	
Field/Location: Grand Junction	
Equipment Number: HS-0030	Eq/Circ. ID: HS0030-SEP
Equipment Name/Service: High Pressure Separator	
Physical Location: RDI Yard	
Manufacturer: Micoda Process Systems, Inc.	Manufacturer Serial #: 1256
Year Built: 2005	National Board #: 20
Alberta Registration #: 525009	Canadian Registration #: R9975.2

Reason for Inspection: Scheduled API-510 External Inspection

Condition of Nameplate and/or Bracket: Nameplate is intact. The nameplate bracket is securely attached. The stamping on the nameplate is legible. The painted wording is mostly worn off.

Internal Access: Yes.

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

Grounding Device in Place and Secure?: N/A.

Condition of Foundation and Anchor Bolts: There are no anchor bolts. The (2) vertical support baseplates are welded to the skid/trailer deck/frame. Baseplate-to-deck/frame attachment welds appear sound. Vessel is supported by (2) support saddles welded to the skid deck.

Condition of Steel Supports, Saddles, and Bolting: The (2) vertical supports have no corrosion or distortion. All support structural welds appear sound. The accessible support saddle-to-shell attachment welds have no visual weld defects. Light chipping of coating on (2) saddles.

Condition of Paint and/or Insulation: The paint is in acceptable condition with minor localized chipping and peeling. The coating has light chipping and peeling. The vessel is not coated.

Condition of Nozzles, Flanges, Repads, and Weepholes: The nozzles and flanges are in good condition. All flange bolting is in place and secure. Flanges show light chipping and peeling with light surface corrosion on the flange bolts.

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. Welds appear full and uniform.

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, (2) PSVs set at 2000 & 2160 psi

Date PSV last tested (if there is a tag on the valve): 02/2016

Comments:

There are (2) PSVs. External vessel appears acceptable.

Recommendations:

Repairs Needed:

Robert W. Menke/BGW/MK

API 510 Inspector Signature

0131

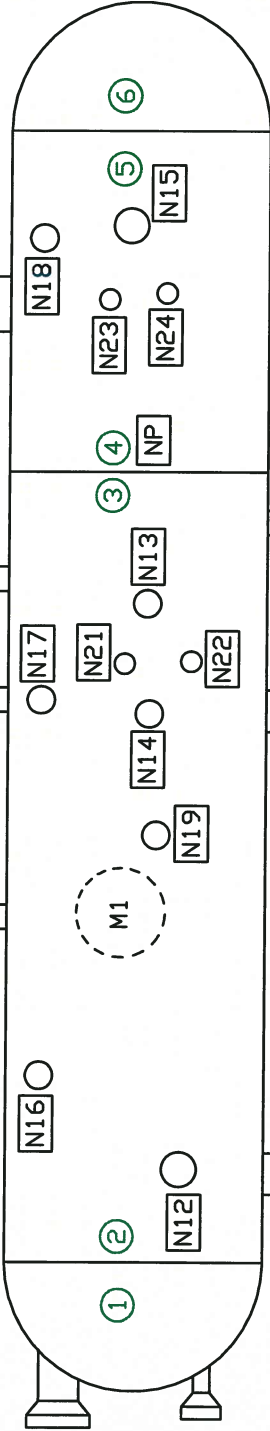
API 510 Inspector Number

09/26/2018

Date

EQUIP RETIREMENT DATE: 8/23/2040
NEXT INSPECTION IS DUE: 9/26/2019

N1	6' INLET	N13	2' SPARGE 2
N2	6' OUTLET	N14	3' WATER LC
N3	2' PSV-1	N15	3' OIL LC
N4	2' PSV-2	N16	6' CLEANING
N5	2' STEAM COIL	N17	6' CLEANING
N6	2' STEAM COIL	N18	6' CLEANING
N7	4' SOLIDS DRAIN	N19	1' TI
N8	3' WATER DRAIN	N20	1' PI
N9	3' OIL OUT	N21	1' WATER LG
N10	2' WATER OUT	N22	1' WATER LG
N11	2' OIL DRAIN	N23	1' OIL LG
N12	2' SPARGE 1	N24	1' OIL LG



TC-560

NAMEPLATE INFO	
MFG	MICODDA PROCESS SYSTEMS
SERIAL NUMBER	1256
NATIONAL BOARD #	20
DATE BUILT	2005
DESIGN P & T	2000 psi @ 200°F
NOTE	CRN R9975.2 ALBERTA REG # 525009

CAL BLK: 70°F VESSEL: 65°F

BUSINESS FMC TECHNOLOGIES COMPLETION	
UNIT	HS0030-SEP
EQ/CIRC ID #	SEPARATOR
EQUIP NAME	INSIDE SKID UNIT HS-0030
LOCATION	HS0030-SEP
DWG #	

DESC: HIGH PRESSURE SEPARATOR

DWG#: HS0030-SEP-1.01-125.04

- #1. 01- FRONT 2. 951 TC
#1. 02- BOTTOM 2. 958 TC
#1. 03- BACK 2. 956 TC
#1. 04- TOP 3. 003 TC
#2. 01- FRONT 3. 008 TC
#2. 02- BOTTOM 3. 020 TC
#2. 03- BACK 3. 066 TC
#2. 04- TOP 3. 038 TC
#3. 01- FRONT 3. 028 TC
#3. 02- BOTTOM 3. 020 TC
#3. 03- BACK 3. 023 TC
#3. 04- TOP 3. 010 TC
#4. 01- FRONT 3. 033 TC
#4. 02- BOTTOM 3. 023 TC
#4. 03- BACK 3. 033 TC
#4. 04- TOP 3. 026 TC
#5. 01- FRONT 3. 005 TC
#5. 04- TOP 2. 993 TC
#6. 01- FRONT 2. 960 TC
#6. 02- BOTTOM 2. 966 TC
#6. 03- BACK 2. 960 TC
#6. 04- TOP 2. 936 TC
#101. 01- N-1 INLET-TOP 2. 448 TC
#101. 02- N-1 INLET-LEFT 2. 459 TC
#101. 03- N-1 INLET-BTM 2. 445 TC
#101. 04- N-1 INLET-RIGHT 2. 460 TC
#102. 01- N-2 OUTLET-FRONT 2. 464 TC
#102. 02- N-2 OUTLET-LEFT 2. 469 TC
#102. 03- N-2 OUTLET-BACK 2. 475 TC
#102. 04- N-2 OUTLET-RIGHT 2. 466 TC

- #103. 01- N-3 PSV-1-FRONT 0. 350 TC
#104. 01- N-4 PSV-2-FRONT 0. 301 TC
#104. 03- N-4 PSV-2-BACK 0. 326 TC
#105. 01- N-5STMCOIL-F-TOP 0. 416 TC
#105. 03- N-5STMCOIL-F-BTM 0. 430 TC
#106. 01- N-6STMCOIL-BK-T 0. 410 TC
#106. 03- N-6STMCOIL-BK-B 0. 433 TC
#107. 01- N-7SLDSDRAIN-F 1. 772 TC
#107. 02- N-7SLDSDRAIN-L 1. 772 TC
#107. 03- N-7SLDSDRAIN-B 1. 774 TC
#107. 04- N-7SLDSDRAIN-R 1. 774 TC
#108. 01- N-8 H2ODRAIN-F 1. 560 TC
#108. 02- N-8 H2ODRAIN-L 1. 550 TC
#108. 03- N-8 H2ODRAIN-BK 1. 538 TC
#108. 04- N-8 H2ODRAIN-RGT 1. 561 TC
#110. 01- N-10 H2O OUT-F 0. 300 TC
#110. 03- N-10 H2O OUT-BK 0. 311 TC
#111. 01- N-11-DILDR-F 0. 326 TC
#111. 03- N-11-DILDR-BK 0. 311 TC
#112. 01- N-12-SPARGE-TOP 0. 332 TC
#112. 03- N-12-SPARGE-BTM 0. 316 TC
#113. 01- N-13-TOP 0. 356 TC
#113. 02- N-13-BTM 0. 331 TC
#114. 01- N-14-WATER-T 1. 572 TC
#114. 02- N-14-WATER-R 1. 566 TC
#114. 03- N-14-WATER-B 1. 570 TC
#114. 04- N-14-WATER-L 1. 574 TC
#115. 01- N-15-DIL-LC-TOP 1. 572 TC
#115. 02- N-15-DIL-LC-L 1. 574 TC
#115. 03- N-15-DIL-LC-BTM 1. 565 TC
#115. 04- N-15-DIL-LC-R 1. 570 TC
#116. 01- N-16-F 2. 054 TC
#116. 02- N-16-L 2. 053 TC
#116. 03- N-16-R 2. 055 TC
#116. 04- N-16-B 2. 058 TC
#117. 01- N-17-F 2. 072 TC
#117. 02- N-17-L 2. 073 TC
#117. 03- N-17-B 2. 073 TC
#117. 04- N-17-R 2. 071 TC
#118. 01- N-18-F 2. 044 TC
#118. 02- N-18-L 2. 046 TC
#118. 03- N-18-B 2. 046 TC
#118. 04- N-18-R 2. 044 TC
#119. 01- N-19 TI-TOP 0. 317 TC
#119. 03- N-19 TI-BTM 0. 350 TC
#120. 01- N-20 PI-FRONT 0. 340 TC
#120. 03- N-20 PI-FBACK 0. 343 TC
#121. 01- N-21-H2DLG-TOP 0. 333 TC
#121. 03- N-21-H2DLG-BTM 0. 342 TC
#122. 01- N-22-H2DLG-TOP 0. 321 TC
#122. 03- N-22-H2DLG-BTM 0. 324 TC
#123. 01- N-23-DIL- LG-TOP 0. 337 TC
#123. 03- N-23-DIL- LG-BTM 0. 336 TC
#124. 01- N-24-DIL- LG-TOP 0. 331 TC
#124. 03- N-24-DIL- LG-BTM 0. 323 TC
#125. 01- MW-1-TOP 3. 022 TC
#125. 02- MW-1-LEFT 3. 036 TC
#125. 03- MW-1-RIGHT 3. 018 TC
#125. 04- MW-1-BTM 3. 002 TC

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: HS0030-SEP
Eq Type: VESSEL
Class:
CM RBI:
Design Code: S8/D1

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: HORIZONTAL SEPARATOR; SN: 1256

Summary: Group Name:
Insp. Due Date = 09/26/2019
Pred. Ret. Date = 08/23/2040

Group Description:
RCR = 5.5 MPY
Rem. Life (from last survey 09/26/2018) = 21.9 yrs

O 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
1.01	FRONT	N	2.965 TC	11/14/2007	2.960 RR	02/15/2016	2.951 TC	09/26/2018	3.4	1.3	0.9	3.4	2.525 P	3.4	12/17/2143	09/26/2019
1.02	BOTTOM	N	2.969 TC	11/14/2007	2.955 TC	02/15/2016	2.955 RR	09/26/2018	0	1.3	1.2	4.5	2.525 P	1.3	07/06/2349	09/26/2019
1.03	BACK	N	2.960 TC	11/14/2007	2.951 RR	02/15/2016	2.956 TC	09/26/2018	0	0.4	0.6	5.7	2.525 P	0.4	04/04/3096	09/26/2019
1.04	TOP	N	3.010 TC	11/14/2007	3.000 RR	02/15/2016	3.003 TC	09/26/2018	0	0.6	0.8	2.3	2.525 P	0.6	06/03/2815	09/26/2019
2.01	FRONT	N	3.038 TC	11/14/2007	3.012 TC	02/15/2016	3.008 TC	09/26/2018	1.5	2.8	3.2	6.0	2.660 P	2.8	03/06/2143	09/26/2019
2.02	BOTTOM	N	3.034 TC	11/14/2007	3.014 RR	02/15/2016	3.020 TC	09/26/2018	0	1.3	2.3	23.7	2.660 P	1.3	08/31/2295	09/26/2019
2.03	BACK	N	3.040 TC	11/14/2007	3.037 TC	02/15/2016	3.037 RR	09/26/2018	0	0.3	20.0	1041.2	2.660 P	0.3	06/05/3275	09/26/2019
2.04	TOP	N	3.047 TC	11/14/2007	3.038 RR	02/15/2016	3.038 TC	09/26/2018	0	0.8	0.8	9.0	2.660 P	0.8	03/31/2491	09/26/2019
3.01	FRONT	N	3.031 TC	11/14/2007	3.027 TC	02/15/2016	3.027 RR	09/26/2018	0	0.4	0.3	1.7	2.660 P	0.4	04/03/2936	09/26/2019
3.02	BOTTOM	N	3.022 TC	11/14/2007	2.985 RR	02/15/2016	3.017 RR	09/26/2018	0	0.5	2.8	43.0	2.660 P	0.5	10/01/2732	09/26/2019
3.03	BACK	N	3.025 TC	11/14/2007	3.015 RR	02/15/2016	3.023 TC	09/26/2018	0	0.2	0.8	9.0	2.660 P	0.2	10/10/3833	09/26/2019
3.04	TOP	N	3.057 TC	11/14/2007	3.013 TC	02/15/2016	3.010 TC	09/26/2018	1.1	4.3	2.6	9.1	2.660 P	4.3	02/18/2100	09/26/2019
4.01	FRONT	N	3.037 TC	11/14/2007	3.032 TC	02/15/2016	3.032 RR	09/26/2018	0	0.5	0.4	2.2	2.660 P	0.5	10/02/2762	09/26/2019
4.02	BOTTOM	N	3.024 TC	11/14/2007	2.987 RR	02/15/2016	3.023 TC	09/26/2018	0	0.1	3.0	46.4	2.660 P	0.1	10/11/4018	09/26/2019
4.03	BACK	N	3.031 TC	11/14/2007	3.026 RR	02/15/2016	3.033 TC	09/26/2018	0	0	0.3	5.7	2.660 P	0.1	10/11/4018	09/26/2019
4.04	TOP	N	3.031 TC	11/14/2007	3.026 TC	02/15/2016	3.026 TC	09/26/2018	0	0.5	0.8	3.4	2.660 P	0.5	10/02/2750	09/26/2019
5.01	FRONT	N	3.010 TC	11/14/2007	3.002 RR	02/15/2016	3.005 TC	09/26/2018	0	0.5	0.6	4.5	2.660 P	0.5	10/01/2708	09/26/2019
5.04	TOP	N	3.012 TC	11/14/2007	2.990 RR	02/15/2016	2.993 TC	09/26/2018	0	1.7	2.2	14.0	2.660 P	1.7	08/16/2214	09/26/2019
6.01	FRONT	N	2.967 TC	11/14/2007	2.961 TC	02/15/2016	2.960 TC	09/26/2018	0.4	0.6	0.5	2.4	2.525 P	0.6	10/02/2743	09/26/2019
6.02	BOTTOM	N	3.001 TC	11/14/2007	2.959 RR	02/15/2016	2.966 TC	09/26/2018	0	3.2	2.5	11.5	2.525 P	3.2	07/20/2156	09/26/2019

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: HS0030-SEP
Eq Type: VESSEL
Class:
CM RBI:
Design Code: S8/D1

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: HORIZONTAL SEPARATOR; SN: 1256

Summary: Group Name:
Insp. Due Date = 09/26/2019
Pred. Ret. Date = 08/23/2040

Group Description:
RCR = 5.5 MPY

Rem. Life (from last survey 09/26/2018) = 21.9 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	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
6.03	BACK	N	2.962 TC	11/14/2007	2.960 TC	02/15/2016	2.960 TC	09/26/2018	0	0.2	0.1	1.2	2.525 P	0.2	10/11/4018	09/26/2019
6.04	TOP	N	2.941 TC	11/14/2007	2.939 TC	02/15/2016	2.936 TC	09/26/2018	1.1	0.5	0.2	1.8	2.525 P	1.1	05/19/2392	09/26/2019
101.01	N-1 INLET-TOP	N	2.462 TC	11/14/2007	2.449 TC	02/15/2016	2.448 TC	09/26/2018	0.4	1.3	1.4	4.9	2.036 U	1.3	09/01/2335	09/26/2019
101.02	N-1 INLET-LEFT	N	2.469 TC	11/14/2007	2.458 RR	02/15/2016	2.459 TC	09/26/2018	0	0.9	0.9	3.1	2.036 U	0.9	09/29/2488	09/26/2019
101.03	N-1 INLET-BTM	N	2.471 TC	11/14/2007	2.448 RR	02/15/2016	2.445 TC	09/26/2018	1.1	2.4	2.6	4.4	2.036 U	2.4	02/26/2189	09/26/2019
101.04	N-1 INLET-RIGHT	N	2.467 TC	11/14/2007	2.452 RR	02/15/2016	2.459 RR	09/26/2018	0	0.7	1.0	4.0	2.036 U	0.7	01/13/2623	09/26/2019
102.01	N-2 OUTLET-FRONT	N	2.471 TC	11/14/2007	2.460 TC	02/15/2016	2.460 RR	09/26/2018	0	1.0	1.0	2.3	2.036 U	1.0	09/29/2442	09/26/2019
102.02	N-2 OUTLET-LEFT	N	2.479 TC	11/14/2007	2.469 TC	02/15/2016	2.469 TC	09/26/2018	0	0.9	1.1	4.5	2.036 U	0.9	11/09/2499	09/26/2019
102.03	N-2 OUTLET-BACK	N	2.482 TC	11/14/2007	2.470 RR	02/15/2016	2.475 TC	09/26/2018	0	0.6	1.0	4.5	2.036 U	0.6	06/02/2750	09/26/2019
102.04	N-2 OUTLET-RIGHT	N	2.472 TC	11/14/2007	2.464 RR	02/15/2016	2.466 TC	09/26/2018	0	0.6	1.1	11.3	2.036 U	0.6	06/03/2735	09/26/2019
103.01	N-3 PSV-1-FRONT	N	0.416	11/14/2007	0.347 RR	02/15/2016	0.349 RR	09/26/2018	0	6.2	6.9	21.6	0.176 U	6.2	08/22/2046	09/26/2019
104.01	N-4 PSV-2-FRONT	N *	0.379	11/14/2007	0.298 RR	02/15/2016	0.299 RR	09/26/2018	0	7.4	8.5	19.2	0.176 U	7.4	05/11/2035	09/26/2019
104.03	N-4 PSV-2-BACK	N *	0.387	11/14/2007	0.318 TC	02/15/2016	0.318 RR	09/26/2018	0	6.3	6.9	15.4	0.176 U	6.3	04/11/2041	09/26/2019
105.01	N-5TMCویل-F-TOP	N	0.451	11/14/2007	0.412 RR	02/15/2016	0.416 TC	09/26/2018	0	3.2	3.9	11.1	0.176 U	3.2	09/26/2093	09/26/2019
105.03	N-5TMCویل-F-BTM	N	0.444	11/14/2007	0.418 TC	02/15/2016	0.418 RR	09/26/2018	0	2.4	2.4	5.2	0.176 U	2.4	07/28/2119	09/26/2019
106.01	N-6STMCOIL-BK-T	N	0.448	11/14/2007	0.409 RR	02/15/2016	0.410 TC	09/26/2018	0	3.5	4.0	11.8	0.176 U	3.5	08/05/2085	09/26/2019
106.03	N-6STMCOIL-BK-B	N	0.438	11/14/2007	0.420 RR	02/15/2016	0.424 RR	09/26/2018	0	1.3	2.3	21.0	0.176 U	1.3	07/05/2209	09/26/2019
107.01	N-7SLDSDRAIN-F	N	1.810 NM	09/07/2005	1.766 TC	02/15/2016	1.766 RR	09/26/2018	0	3.4	3.6	4.2	1.459 U	3.4	01/12/2109	09/26/2019
107.02	N-7SLDSDRAIN-L	N	1.812	11/14/2007	1.779 TC	02/15/2016	1.772 TC	09/26/2018	2.7	3.7	2.4	9.4	1.459 U	3.7	05/02/2103	09/26/2019
107.03	N-7SLDSDRAIN-B	N	1.814	11/14/2007	1.777 TC	02/15/2016	1.774 TC	09/26/2018	1.1	3.7	3.2	8.7	1.459 U	3.7	11/16/2103	09/26/2019
107.04	N-7SLDSDRAIN-R	N	1.810 NM	09/07/2005	1.798 TC	02/15/2016	1.774 TC	09/26/2018	9.2	2.8	2.3	9.2	1.459 U	9.2	12/22/2052	09/26/2019

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: HS0030-SEP
Eq Type: VESSEL
Class:
CM RBI:
Design Code: S8/D1

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: HORIZONTAL SEPARATOR; SN: 1256

Summary: Group Name: Insp. Due Date = 09/26/2019
Pred. Ret. Date = 08/23/2040

Group Description:

RCR = 5.5 MPY

Rem. Life (from last survey 09/26/2018) = 21.9 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
108.01	N-8 H2ODRAIN-F	N	1.580 NM	09/07/2005	1.546 TC	02/15/2016	1.546 RR	09/26/2018	0	2.6	2.8	3.3	1.278 U	2.6	10/25/2121	09/26/2019
108.02	N-8 H2ODRAIN-L	N	1.580 NM	09/07/2005	1.557 TC	02/15/2016	1.550 TC	09/26/2018	2.7	2.3	2.3	2.7	1.278 U	2.7	06/25/2119	09/26/2019
108.03	N-8 H2ODRAIN-BK	N	1.607	11/14/2007	1.532 RR	02/15/2016	1.538 TC	09/26/2018	0	6.3	5.2	17.4	1.278 U	6.3	01/03/2060	09/26/2019
108.04	N-8 H2ODRAIN-RGT	N	1.615	11/14/2007	1.552 RR	02/15/2016	1.561 TC	09/26/2018	0	5.0	3.7	14.1	1.278 U	5.0	05/03/2075	09/26/2019
110.01	N-10 H20 OUT-F	N	0.344 NM	09/07/2005	0.299 TC	02/15/2016	0.299 RR	09/26/2018	0	3.4	3.7	4.3	0.176 U	3.4	11/29/2054	09/26/2019
110.03	N-10 H20 OUT-BK	N	0.345	11/14/2007	0.308 TC	02/15/2016	0.308 RR	09/26/2018	0	3.4	3.7	9.4	0.176 U	3.4	07/23/2057	09/26/2019
111.01	N-11-OILDR-F	N	0.344 NM	09/07/2005	0.328 TC	02/15/2016	0.326 TC	09/26/2018	0.8	1.4	1.4	1.5	0.176 U	1.4	11/18/2125	09/26/2019
111.03	N-11-OILDR-BK	N	0.337	11/14/2007	0.310 RR	02/15/2016	0.311 TC	09/26/2018	0	2.4	3.3	27.1	0.176 U	2.4	12/26/2074	09/26/2019
112.01	N-12-SPARGE-TOP	N	0.394	11/14/2007	0.325 RR	02/15/2016	0.332 TC	09/26/2018	0	5.7	5.0	17.4	0.176 U	5.7	02/07/2046	09/26/2019
112.03	N-12-SPARGE-BTM	N	0.351	11/14/2007	0.309 RR	02/15/2016	0.316 TC	09/26/2018	0	3.2	3.6	20.4	0.176 U	3.2	06/27/2062	09/26/2019
113.01	N-13-TOP	N	0.404	11/14/2007	0.347 RR	02/15/2016	0.356 TC	09/26/2018	0	4.4	4.1	13.4	0.176 U	4.4	08/24/2059	09/26/2019
113.02	N-13-BTM	N	0.381	11/14/2007	0.327 RR	02/15/2016	0.331 TC	09/26/2018	0	4.6	4.1	10.7	0.176 U	4.6	06/06/2052	09/26/2019
114.01	N-14-WATER-T	N	1.639	11/14/2007	1.571 TC	02/15/2016	1.571 RR	09/26/2018	0	6.3	5.2	16.8	1.278 U	6.3	03/30/2065	09/26/2019
114.02	N-14-WATER-L	N	1.611	11/14/2007	1.560 RR	02/15/2016	1.566 TC	09/26/2018	0	4.1	3.7	13.0	1.278 U	4.1	12/24/2088	09/26/2019
114.03	N-14-WATER-R	N	1.613	11/14/2007	1.559 RR	02/15/2016	1.570 TC	09/26/2018	0	4.0	4.0	12.2	1.278 U	4.0	09/26/2091	09/26/2019
114.04	N-14-WATER-B	N	1.609	11/14/2007	1.569 TC	02/15/2016	1.569 RR	09/26/2018	0	3.7	3.0	8.6	1.278 U	3.7	05/20/2097	09/26/2019
115.01	N-15-OIL-LC-TOP	N	1.616	11/14/2007	1.568 TC	02/15/2016	1.568 RR	09/26/2018	0	4.4	3.6	11.0	1.278 U	4.4	08/23/2084	09/26/2019
115.02	N-15-OIL-LC-L	N	1.620	11/14/2007	1.570 RR	02/15/2016	1.574 TC	09/26/2018	0	4.2	3.4	13.1	1.278 U	4.2	03/18/2089	09/26/2019
115.03	N-15-OIL-LC-BTM	N	1.616	11/14/2007	1.561 RR	02/15/2016	1.564 RR	09/26/2018	0	4.8	4.1	12.4	1.278 U	4.8	04/27/2078	09/26/2019
115.04	N-15-OIL-LC-R	N	1.614	11/14/2007	1.562 TC	02/15/2016	1.562 RR	09/26/2018	0	4.8	3.9	13.8	1.278 U	4.8	11/26/2077	09/26/2019

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: HS0030-SEP
Eq Type: VESSEL
Class:
CM RBI:
Design Code: S8/D1

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: HORIZONTAL SEPARATOR; SN: 1256

Summary: Group Name:
Insp. Due Date = 09/26/2019
Pred. Ret. Date = 08/23/2040

Group Description:
RCR = 5.5 MPY

Rem. Life (from last survey 09/26/2018) = 21.9 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
116.01	N-16-F	N	2.059 TC	11/14/2007	2.047 RR	02/15/2016	2.052 RR	09/26/2018	0	0.6	0.6	7.0	1.652 U	0.6	06/01/2685	09/26/2019
116.02	N-16-L	N	2.063 TC	11/14/2007	2.055 TC	02/15/2016	2.053 TC	09/26/2018	0.8	0.9	0.6	2.1	1.652 U	0.9	04/19/2464	09/26/2019
116.03	N-16-B	N	2.063 TC	11/14/2007	2.050 RR	02/15/2016	2.058 TC	09/26/2018	0	0.5	1.1	8.4	1.652 U	0.5	10/02/2830	09/26/2019
116.04	N-16-R	N	2.065 TC	11/14/2007	2.057 RR	02/15/2016	2.055 TC	09/26/2018	0.8	0.9	0.8	2.3	1.652 U	0.9	07/10/2466	09/26/2019
117.01	N-17-F	N	2.080 TC	11/14/2007	2.075 TC	02/15/2016	2.072 TC	09/26/2018	1.1	0.7	0.6	3.8	1.652 U	1.1	07/24/2400	09/26/2019
117.02	N-17-L	N	2.082 TC	11/14/2007	2.070 RR	02/15/2016	2.073 TC	09/26/2018	0	0.8	1.0	3.4	1.652 U	0.8	12/30/2544	09/26/2019
117.03	N-17-B	N	2.082 TC	11/14/2007	2.072 RR	02/15/2016	2.073 TC	09/26/2018	0	0.8	0.7	2.0	1.652 U	0.8	12/30/2544	09/26/2019
117.04	N-17-R	N	2.078 TC	11/14/2007	2.073 TC	02/15/2016	2.071 TC	09/26/2018	0.8	0.6	0.3	1.2	1.652 U	0.8	07/01/2542	09/26/2019
118.01	N-18-F	N	2.045 TC	11/14/2007	2.035 RR	02/15/2016	2.042 RR	09/26/2018	0	0.3	0.8	5.0	1.652 U	0.3	10/06/3318	09/26/2019
118.02	N-18-L	N	2.049 TC	11/14/2007	2.043 RR	02/15/2016	2.046 TC	09/26/2018	0	0.3	0.4	3.4	1.652 U	0.3	02/05/3332	09/26/2019
118.03	N-18-B	N	2.049 TC	11/14/2007	2.038 RR	02/15/2016	2.042 RR	09/26/2018	0	0.6	1.1	5.7	1.652 U	0.6	09/30/2668	09/26/2019
118.04	N-18-R	N	2.048 TC	11/14/2007	2.040 RR	02/15/2016	2.044 TC	09/26/2018	0	0.4	0.7	6.8	1.652 U	0.4	10/03/2998	09/26/2019
119.01	N-19 TI-TOP	N *	0.376	11/14/2007	0.318 RR	02/15/2016	0.317 TC	09/26/2018	0.4	5.4	4.4	14.6	0.188 U	5.4	08/16/2042	09/26/2019
119.03	N-19 TI-BTM	N	0.383	11/14/2007	0.342 RR	02/15/2016	0.346 RR	09/26/2018	0	3.4	3.1	8.8	0.188 U	3.4	03/16/2065	09/26/2019
120.01	N-20 PI-FRONT	N	0.382	11/14/2007	0.337 RR	02/15/2016	0.340 TC	09/26/2018	0	3.9	4.4	11.6	0.188 U	3.9	09/16/2057	09/26/2019
120.03	N-20 PI-FBACK	N	0.399	11/14/2007	0.338 RR	02/15/2016	0.343 TC	09/26/2018	0	5.2	6.0	15.2	0.188 U	5.2	07/17/2048	09/26/2019
121.01	N-21-H2OLG-TOP	N *	0.389	11/14/2007	0.327 TC	02/15/2016	0.327 RR	09/26/2018	0	5.7	4.7	12.4	0.188 U	5.7	02/14/2043	09/26/2019
121.03	N-21-H2OLG-BTM	N	0.386	11/14/2007	0.337 RR	02/15/2016	0.342 TC	09/26/2018	0	4.0	4.0	10.6	0.188 U	4.0	03/27/2057	09/26/2019
122.01	N-22-H2OLG-TOP	N *	0.375	11/14/2007	0.315 TC	02/15/2016	0.315 RR	09/26/2018	0	5.5	4.1	15.5	0.188 U	5.5	10/29/2041	09/26/2019
122.03	N-22-H2OLG-BTM	N *	0.395	11/14/2007	0.325 RR	02/15/2016	0.324 TC	09/26/2018	0.4	6.5	5.4	17.9	0.188 U	6.5	08/29/2039	09/26/2019
123.01	N-23-OIL- LG-TOP	N	0.391	11/14/2007	0.335 RR	02/15/2016	0.337 TC	09/26/2018	0	5.0	4.4	13.3	0.188 U	5.0	07/14/2048	09/26/2019

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: HS0030-SEP
Eq Type: VESSEL
Class:
CM RBI:
Design Code: S8/D1

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: HORIZONTAL SEPARATOR; SN: 1256

Summary: Group Name: Group Description: 0 C.A. Status: No
Insp. Due Date = 09/26/2019 RCR = 5.5 MPY Total Caution TMLs = 0
Pred. Ret. Date = 08/23/2040 Rem. Life (from last survey 09/26/2018) = 21.9 yrs

TML No	Location	Ctn	First Survey Thick	First Survey Nt	First Date	Previous Survey Thick	Previous Survey Nt	Previous Date	Last Survey Thick	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
123.03	N-23-OIL- LG-BTM	N	0.383		11/14/2007	0.342 TC	0.336 TC	02/15/2016	0.336 TC	09/26/2018	2.3	4.3	4.1	9.3	0.188 U	4.3	02/25/2053	09/26/2019
124.01	N-24-OIL- LG-TOP	N	0.378		11/14/2007	0.327 RR	0.329 RR	02/15/2016	0.329 RR	09/26/2018	0	4.5	3.1	12.2	0.188 U	4.5	01/26/2050	09/26/2019
124.03	N-24-OIL- LG-BTM	N	0.363		11/14/2007	0.325 RR	0.323 TC	02/15/2016	0.323 TC	09/26/2018	0.8	3.7	3.9	8.6	0.188 U	3.7	03/23/2055	09/26/2019
125.01	MW-1-TOP	N	3.019 TC		11/14/2007	3.021 TC	3.021 RR	02/15/2016	3.021 RR	09/26/2018	0	0	0	0	2.562 U	0.1	10/11/4018	09/26/2019
125.02	MW-1-LEFT	N	3.017 TC		11/14/2007	3.015 TC	3.015 RR	02/15/2016	3.015 RR	09/26/2018	0	0.2	0.3	1.0	2.562 U	0.2	10/11/4018	09/26/2019
125.03	MW-1-RIGHT	N	3.021 TC		11/14/2007	3.007 TC	3.007 RR	02/15/2016	3.007 RR	09/26/2018	0	1.3	1.8	4.5	2.562 U	1.3	01/19/2361	09/26/2019
125.04	MW-1-BTM	N	3.024 TC		11/14/2007	2.983 TC	2.983 RR	02/15/2016	2.983 RR	09/26/2018	0	3.8	4.2	21.7	2.562 U	3.8	07/12/2129	09/26/2019

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

Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: HS0030-SEP
Design Code: S8/D1
Eq Type: VESSEL
Class:
CM RBI:

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

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: HORIZONTAL SEPARATOR; SN: 1256

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 : 2.6 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 5.5 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 3.0 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 5.5 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 = 21.9 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 08/23/2040

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

API 510 PRESSURE VESSEL INTERNAL INSPECTION

Operations Center: FMC Technologies Completion	Field Name: Grand Junction
Facility/Location Name: Grand Junction	
Equipment Number: HS-0030	Eq/Circ. ID: HS-0030
Equipment Name/Service: High Stage Separator	
Physical Location: RDI Yard	
Manufacturer: Micoda Process Systems	Manufacturer Serial Number: 1256
Year Built: 2005	National Board Number: 20
Alberta Registration #: 525009	Canadian Registration #: R9975.2

Reason for Inspection: Scheduled API Inspection.

Type and quality of cleaning: (Hot water wash suitable for inspection.) Clean with no sand or product present, however mice feces was present between weir plates.

Manway entrance and gasket seating area: Light surface corrosion and pitting along bottom of manway nozzle entrance (.100"). Light corrosion around sealing surface.

Shell (note pitting, corrosion, laminations, blisters, etc. - size and location): Coating has chipping and peeling with light surface corrosion. Large pits across bottom of shell, which measure .170" to .230".

Heads (note pitting, corrosion, laminations, blisters, etc. - size and location): Coating has chipping and peeling with light surface corrosion. Moderate scale and minor pitting, nothing measurable.

Internal Circumferential and Long seam Welds: (include type and condition welds): Welds appear to be in acceptable condition with no visible defects.

Internal Nozzle Welds: (include type and condition welds): Majority of nozzle welds appear to be in acceptable condition. 4" solids drain nozzle has heavy preferential corrosion and pitting.

Condition of Internal Attachments and Welds: Attachment welds are visually acceptable. There are no visible defects.

API 510 PRESSURE VESSEL INTERNAL INSPECTION

Comments:

There is corrosion and pitting on steam lines. Pits measure from .100" to .150".

Recommendations:

Make weld repairs to 4" nozzle at next available opportunity. Sand blast and recoat internal. Clean manway flange sealing surfaces.

Repairs Needed:

Repair shell areas with pitting deeper than acceptable limits. Replace steam lines (heavy pitting throughout).

Mike York /BGW

API 510 Inspector Signature

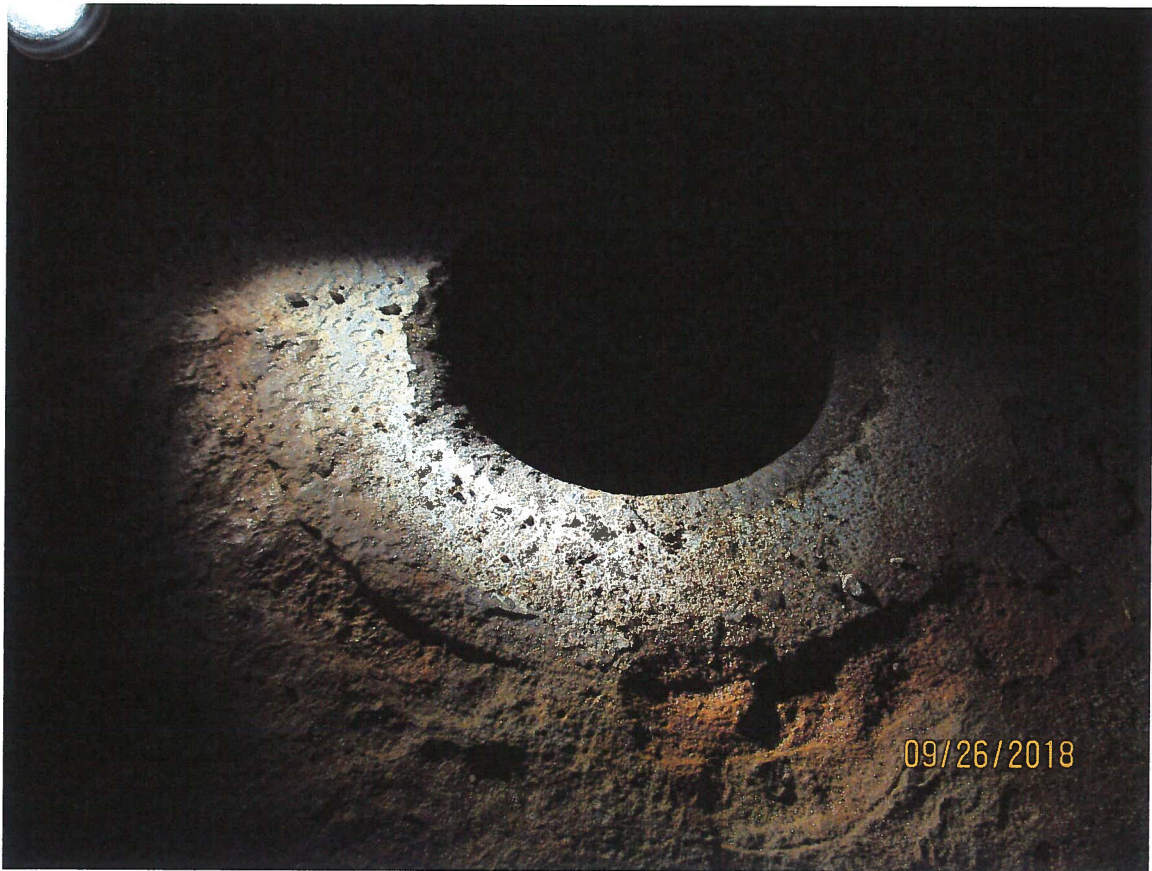
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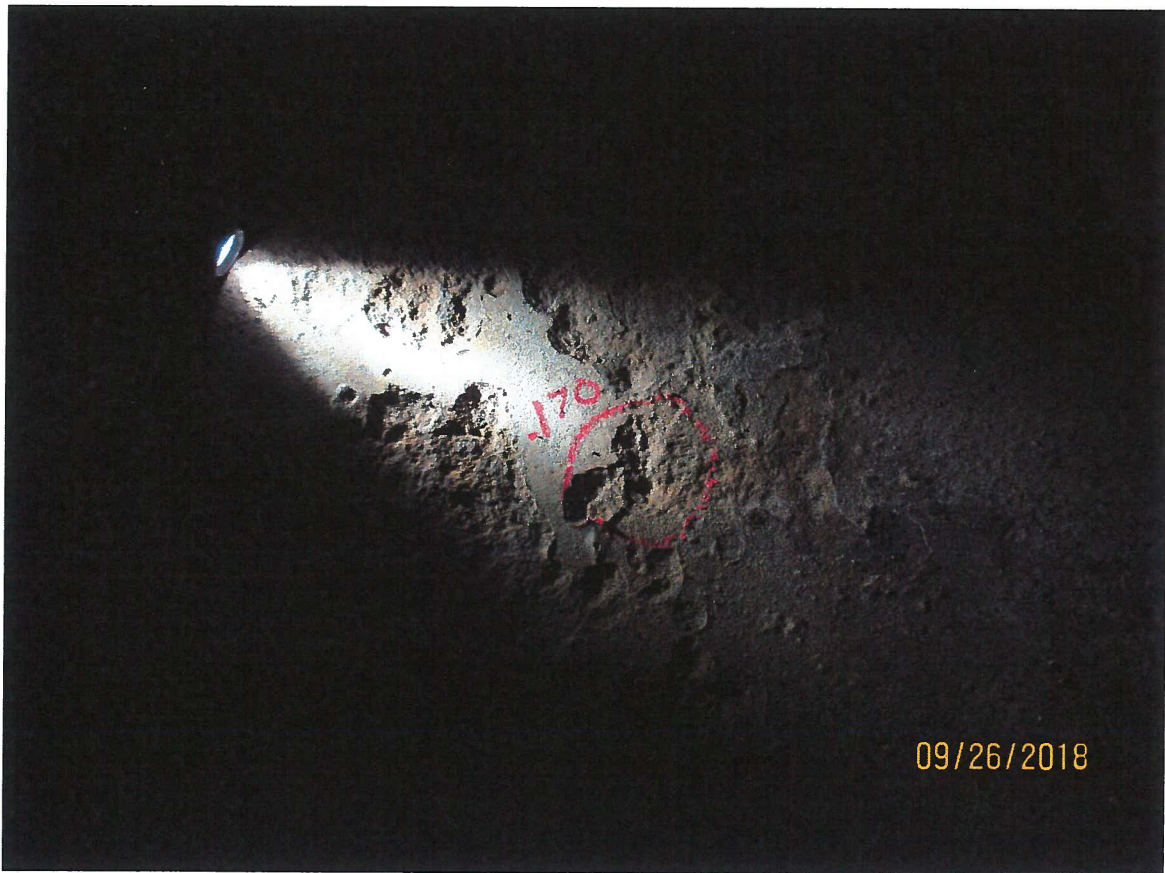
API 510 Inspector Number

09/26/2018

Date





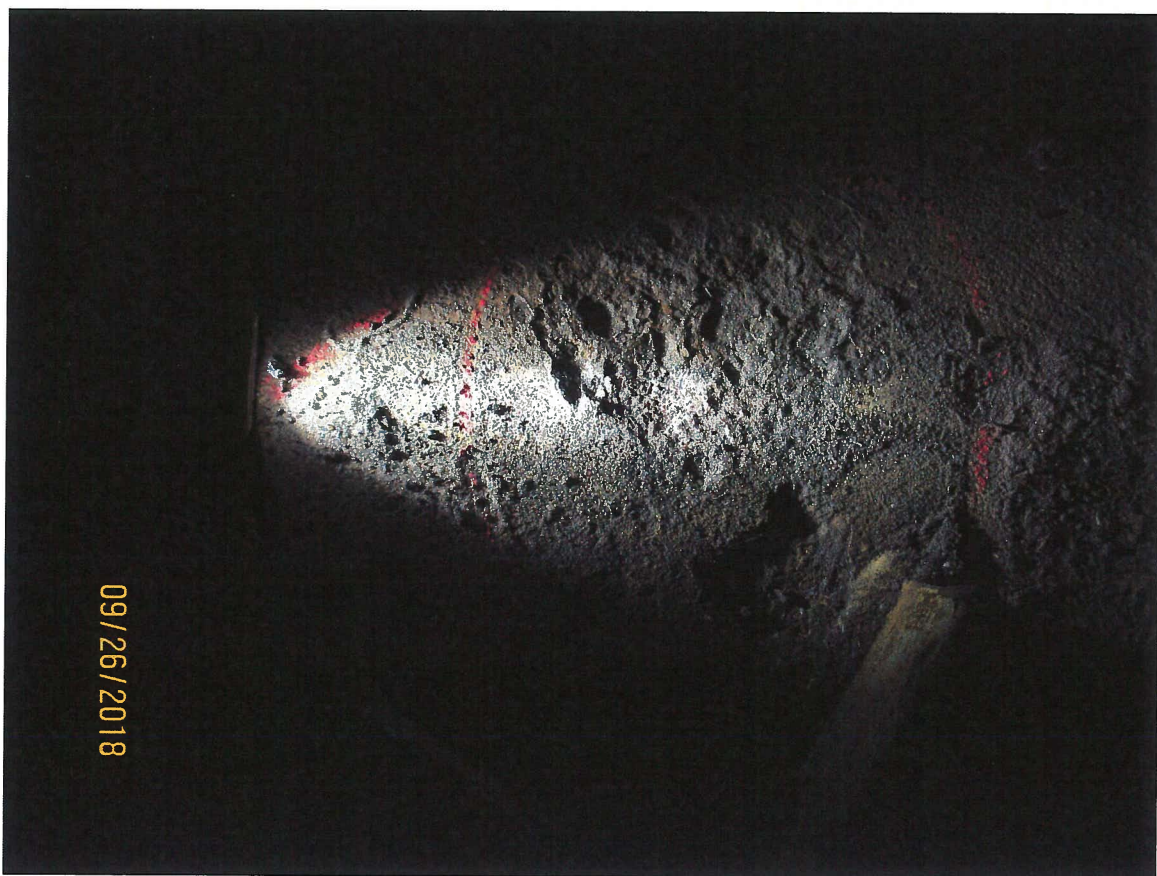




















525009

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

1. Manufactured and certified by MICODA PROCESS SYSTEMS INC., 1211 - 8A STREET NISKU, ALBERTA T9E 7R3 CANADA
(Name and address of Manufacturer)

Manufactured for Pure Energy Services LTD. #300, 1010-1st S.W. Calgary Alberta, Canada T2K-1KA
(Name and address of Purchaser)

3. Location of installation Portable

(Name and address)

4. Type: Horizontal Separator 1256 R 9975.2 HV 44 Rev 4 20 2005
(Horiz., vert., or sphere) (Tank, separator, jkt. vessel, heat exh., etc.) (Mfg's serial No.) (CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

5. ASME Code, Section VIII, Div. 1 2004 N/A N/A
Edition and Addenda (date) Code Case No. Special Service per UG-420(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): 2 (b) Overall length (ft & in.): 14'-0" s/s

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	50" ID	10'	SA 516-70N	3"	0.125"	1	Full			1	1	Full			1	1150 F	2.25 Hr.
2	50" ID	4'	SA 516-70N	3"	0.125"	1	Full			1	1	Full			1	1150 F	2.25 Hr.
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

7. Heads: (a) SA 516-70N 1150F For 2.25Hr. (b) SA 516-70N 1150F For 2.25Hr.
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp

(Math Spec. No., Grade or Type) P.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
(a)	END	2.888"	0.125"	N/A	N/A	2:1 SE	N/A	N/A	N/A	No	Yes	N/A	Seamless		1
(b)	END	2.888"	0.125"	N/A	N/A	2:1 SE	N/A	N/A	N/A	No	Yes	N/A	Seamless		1

If removable, bolts used (describe other fastening)

(Mat'l Spec. No., Grade, size, No.)

8. Type of jacket

Jacket closure

(Describe as ogee & weld, bar, etc.)

If bar, give dimensions

If bolted, describe or sketch.

9. MAWP 2000 N/A psi at max. temp. 200 N/A °F Min. design metal temp. -40 °F at 2000 psi.
(internal) (external) (internal) (external)

10. Impact test Yes: Heads and Shells No: Remaining Components per UCS-66(g) at test temperature of -40 °F
(Indicate yes or no and the component(s) impact tested)

11. Hydro., ~~XXXX~~, ~~XXXXXX~~ test press. 2600 Proof test N/A

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: Stationary (Mat'l Spec. No.) - Dia., in. (subject to press.) - 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: - Mat'l Spec. No., Grade or Type - O.D., in. - Nom. thk., in. or gauge - Number - 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): 1 (b) Overall length (ft & in.): 20'-4" s/s

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	2" NPS	20'-4"	SA 106-B	0.436	Nil	N/A	Seamless			1	1	None			.70	1150 F	2.25 Hr.
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

(b) - (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp

(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp										(Mat'l Spec. No., 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
(a)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

If removable, bolts used (describe other fastening)

(8) 0.625" OD x 3.75" Lg. Studs B7M, (16) 0.625" OD Nuts 2HM

(Mat'l Spec. No., Grade, Size, No.)

16. MAWP 150 2000 psi at max. temp. 400 200 °F Min. design metal temp. -40 °F at 150 psi.
(internal) (external) (internal) (external)

17. Impact test No; Per UCS-66(c) at test temperature of - °F
(Indicate yes or no and the component(s) impact tested)

18. Hydro., ~~###, ####~~ test press. 195 Proof test N/A

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	
-	-	-	-	See Attached	U-4 Form	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

20. Supports: Skirt No Lugs No Legs No Others Saddles Attached Welded to Shell
(Yes or No) (No.) (No.) (Describe) (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)

In-Line Closures S/N 12994(N16), 12991(N17), 12998(N18) CRN OH4712.231

22. Remarks: Construction dwg. 05-591-V Rev. 0

RT-4: Cat. A welds Full RT, Vessel Cat. B Welds Full RT & Steam Coil Cat. B welds No RT

Volume: 217.5 cu./ft.

PSV to be installed in the piping system by others **Hydro test conducted after internal coating**

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. 32693

Expires 7/10/2007

Date 8/05/2005

Name MICODA PROCESS SYSTEMS INC.

Signed [Signature]

(Manufacturer)

(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 Alberta and employed by ABSA of Alberta have inspected the pressure vessel described in this Manufacturer's Data Report on 8/05/2005, 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. 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 8/05/2005

Signed [Signature]

Commissions NB# 12369A AB #144A

(Authorized Inspector)

(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

Date

Name

Signed

(Assembler)

(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

Commissions

(Authorized Inspector)

(Nat'l Board incl. endorsement, State, Province and No.)

1.	Manufactured & Certified By: <u>MICODA PROCESS SYSTEMS Inc. 1211-8A St. Nisku Alberta Canada T9E-7R3</u> (Name and address of Manufacturer)			
2.	Manufactured for: <u>Pure Energy Services LTD. #300, 1010-1st S.W. Calgary Alberta, Canada T2K-1KA</u> (Name & Address of Purchaser)			
3.	Location of Installation: <u>Portable</u> (Name & Address)			
4.	Type: <u>Horizontal</u> (Horizontal, Vert., or Sphere)	<u>Separator</u> (Tank, Separator, Heat Exch., Etc.)	<u>1256</u> (Manufacturer Serial Number)	
	<u>R 9975.2</u> (CRN #)	<u>HV-44 Rev. 4</u> (Drawing No.)	<u>20</u> (National Board No.)	<u>2005</u> (Year Built)

[illegible]

Date August 5, 2005 Name  Commission NB#12869A AB#144A
(Authorized Inspector) (Nat'l Board incl. Endorsement, State, Prov. & No.)

FORM U-2A MANUFACTURER'S PARTIAL DATA REPORT (ALTERNATIVE FORM)
A Part of a Pressure Vessel Fabricated by One Manufacturer for Another Manufacturer
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by In-Line Flow Products Limited, 1417-70 Avenue, Edmonton, Alberta, Canada
 (Name and address of Manufacturer)

2. Manufactured for Stock
 (Name and address of Purchaser)

3. Location of installation Unknown
 (Name and address)

4. Type: NPS6 ANSI 900 Sch 160 In-Line Horizontal Closure 12988 to 12996 Inclusive OH4712.231
 (Description of vessel part (shell, two-piece head, tube bundle)) (Mfg's serial No.) (CRN)
CL01011 Rev 5 In-Line Flow Products Limited 2005
 (Mat'l. Bd. No.) (Drawing No.) (Drawing prepared by) (Year built)

5. ASME Code, Section VIII, Div. 1 2004 Edition N/A
 (Edition and Addenda (date)) (Code Case No.)

6. Shell (a) No. of course(s): One (b) Overall length (ft & in.): 0 Feet - 5.00 inches
 (Special Service per UG-120(d))

No.	Course(s)		Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment		
	Diameter, In.	Length (ft & In.)		Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	5.187	5.00 in	SA350 Grade LF2	0.719	1/8	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
			Class 1											
			Normalized											

7. Heads: (a) SA350 Grade LF2 Class 1 Normalized (b)
 (Mat'l Spec. No., 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)	End	0.613	1/8							Yes	N/A	N/A	N/A	
(b)														

If removable, bolts used (describe other fastening) 7.750-2 Modified Stub ACME-2G
 (Mat'l Spec. No., Grade, Size, No.)

8. MAWP 2220 400 -50 2220 psi
 (Internal) (external) (Internal) (external) °F. Min. design metal temp. °F at psi.

9. Impact test No (See Remarks) at test temperature of °F.
 (Indicate yes or no and the component(s) impact tested)

10. Hydro., pneu., or comb. test press. N/A Proof test N/A

11. 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	
Outlet - Alert Fitting	1	1/2 NPT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Shell

12. Supports: Skirt No Lugs N/A Legs N/A Others Hinge Assm. Cap Pin Attached Welded (WPS inline-1)
 (Yes or no) (No.) (No.) (Describe) (Where and how)

13. Remarks: Cap and Hub Material impact tested per UCS-66(g). Assembly not impact tested. Hydrotest to be performed by others.
Drawing Number CL01011 Revision 5 references Assembly and Machine Drawings used in construction.

CERTIFICATE OF SHOP/FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of material, construction, and workmanship of this pressure vessel part conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.

U Certificate of Authorization No. 33,859 Expires March 26, 2006
 Date June 27, 2005 Name In-Line Flow Products Limited Signed
 (Manufacturer) (Representative)

CERTIFICATE OF SHOP/FIELD 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 Alberta and employed by ABSA of Alberta have inspected the pressure vessel part described in this Manufacturer's Data Report on June 27, 2005

and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel part 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 part 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 June 27, 2005 Signed [Signature] Commissions AB 136A
 (Authorized Inspector) (Nat'l Board Incl. endorsement, State, Province and No.)



ATTN: Dave

SIN 12991, 12994, 12998

U-1 MAY BE IN ERROR...

DRAWING # 04-475-V REV 1

STATES THESE NOZZLES ARE

9.25" OD AND 5.187 ID.

WHICH MAKES THEM 2.031" THICK

USE 2.031" AS A NOMINAL AND

1.906 AS T-MIN (MINUS THE .125 CR.

RECORD NOTE STATING HOW WE DETERMINED
NOMINAL AND RE: THE U-1 DISCREP.

APPLIES TO: AH5005, AH5009,
AH5011 & AH5012, AH5001,
AH5007, AH5006

SEE U4

FORM U-4 MANUFACTURER'S DATA REPORT SUPPLEMENTARY SHEET
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1 **A**

1. Manufactured and certified by: COMPLETE PACKAGE TECHNOLOGY (2000) LTD., 2887 Parsons Road, Edmonton, Alberta T6N 1A3
(Name and address of Manufacturer)

2. Manufactured for: MICODA PROCESS SYSTEMS INC., 1211 - 8A Street Nisku, Alberta
(Name and address of Purchaser)

3. Location of Installation: MICODA PROCESS SYSTMES INC., 1211 - 8A STREET NISKU, ALBERTA
(Name and address)

4. Type: HORIZONTAL SEPARATOR C04-7090
(Honz., vert., or sphere) (Tank separator, heat exh., etc) (Mfg's Serial No.)

R9975.2 04-475-V - R1 2005
(CRN) (Drawing No.) (Bd. No.) (Year Built)

Date Report
Item Number

Remarks

NOZZLES AND OPENINGS

Purpose	No.	Dia	Type	Material	Nom Thk	Re Mat	How Att	Location	
INLET	N1	1	6"	CL 900 RTJ	SA-106-B / SA-105N / SA-350-LF2	2.465"	————	UW16-1c	HEAD
OUTLET	N2	1	6"	CL 900 RTJ	SA-350-LF2	2.465"	————	UW16-1c	SHELL
PSV-1	N3	1	2"	CL 900 RTJ	SA-333-6 / SA-350-LF2	0.344"	————	UW16-1c	SHELL
PSV-2	N4	1	2"	CL 900 RTJ	SA-333-6 / SA-350-LF2	0.344"	————	UW16-1c	SHELL
STEAM COIL	N5	1	2"	CL 150 RF	SA-333-6 / SA-350-LF2 / SA-106-B / SA-105N / SA-234-WPB	0.436"	————	UW16-1c	SHELL
STEAM COIL	N6	1	2"	CL 600 RF	SA-333-6 / SA-350-LF2 / SA-106-B / SA-105N / SA-234-WPB	0.436"	————	UW16-1c	SHELL
SOLIDS DRAIN	N7	1	4"	CL 900 RTJ	SA-350-LF2	1.805"	————	UW16-1c	SHELL
WATER DRAIN	N8	1	3"	CL 900 RTJ	SA-350-LF2	1.580"	————	UW16-1c	SHELL
OIL OUT	N9	1	3"	CL 900 RTJ	SA-350-LF2	1.580"	————	UW16-1c	SHELL
WATER OUT	N10	1	2"	CL 900 RTJ	SA-333-6 / SA-350-LF2	0.344"	————	UW16-1c	SHELL
OIL DRAIN	N11	1	2"	CL 900 RTJ	SA-333-6 / SA-350-LF2	0.344"	————	UW16-1c	SHELL
SPARGE 1	N12	1	2"	CL 900 RTJ	SA-333-6 / SA-350-LF2 / SA-105N	0.344"	————	UW16-1c	SHELL
SPARGE 2	N13	1	2"	CL 900 RTJ	SA-333-6 / SA-350-LF2 / SA-105N	0.344"	————	UW16-1c	SHELL
WATER LC	N14	1	3"	CL 900 RTJ	SA-350-LF2	1.580"	————	UW16-1c	SHELL
OIL LC	N15	1	3"	CL 900 RTJ	SA-350-LF2	1.580"	————	UW16-1c	SHELL
CLEANING	N16/N17/N18	3	6"	CL 900	SA-350-LF2	2.03"	————	UW16-1c	SHELL
MANWAY	M1	1	18"	CL 900 RTJ	SA-350-LF2	3.03"	————	UW16-1c	SHELL
TI	N19	1	1"	CL 900 RTJ	SA-333-6 / SA-350-LF2	0.358"	————	UW16-1c	SHELL
PI	N20	1	1"	CL 900 RTJ	SA-333-6 / SA-350-LF2	0.358"	————	UW16-1c	SHELL
WATER LG	N21/22	2	1"	CL 900 RTJ	SA-333-6 / SA-350-LF2	0.358"	————	UW16-1c	SHELL
OIL LG	N23/24	2	1"	CL 900 RTJ	SA-333-6 / SA-350-LF2	0.358"	————	UW16-1c	SHELL

Certificate of Authorization: Type: U No: 32.148

Expires: 17-Oct-08

Date Feb 10, 2005 Name COMPLETE PACKAGE TECHNOLOGY (2000) LTD.
(Manufacturer)

Signed [Signature]
(Inspector)

Date Feb 10, 2005 Name [Signature]
(Authorized Inspector)

Commission ALBERTA
(Nat'l Board (incl. endorsements) State, Province and No.)



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

Inspections Performed for: FMC Technologies Completion – Grand Junction	
Inspection Report for: HS-0030 Fuel Gas Scrubber	
Remaining Life: 20+ YRS	Date Last Inspected: 09/26/2018
Representative Corrosion Rate: 1.9 MPY	Next UT: 09/26/2019 Next VT: 09/26/2019
Manufacturer: Micoda Process Systems, Inc.	Manufacturer Serial #: 1259
Year Built: 2005	National Board #: None
Alberta Registration #: None	Canadian Registration #: T1592.231

HS-0030 Fuel Gas Scrubber



PRESSURE VESSEL INVENTORY FORM

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

VESSEL ID INFORMATION

Company Name : Pure Energy Services (USA) Inc.
Facility/Location Name : Wyoming District
Field Name :
Equipment Number : HS-0030
Eq/Circ. ID : HS0030-FGS
Equipment Name/Service : Fuel Gas Scrubber
Physical Location :
GPS Coordinates :

VESSEL DESCRIPTION AND SERVICE CONDITIONS

Type of Vessel: Fuel Gas Scrubber

Vessel Size: 8.625"

Operating Pressure Range (psig): 285 psi

Operating Temperature Range (°F): 100°

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) _____

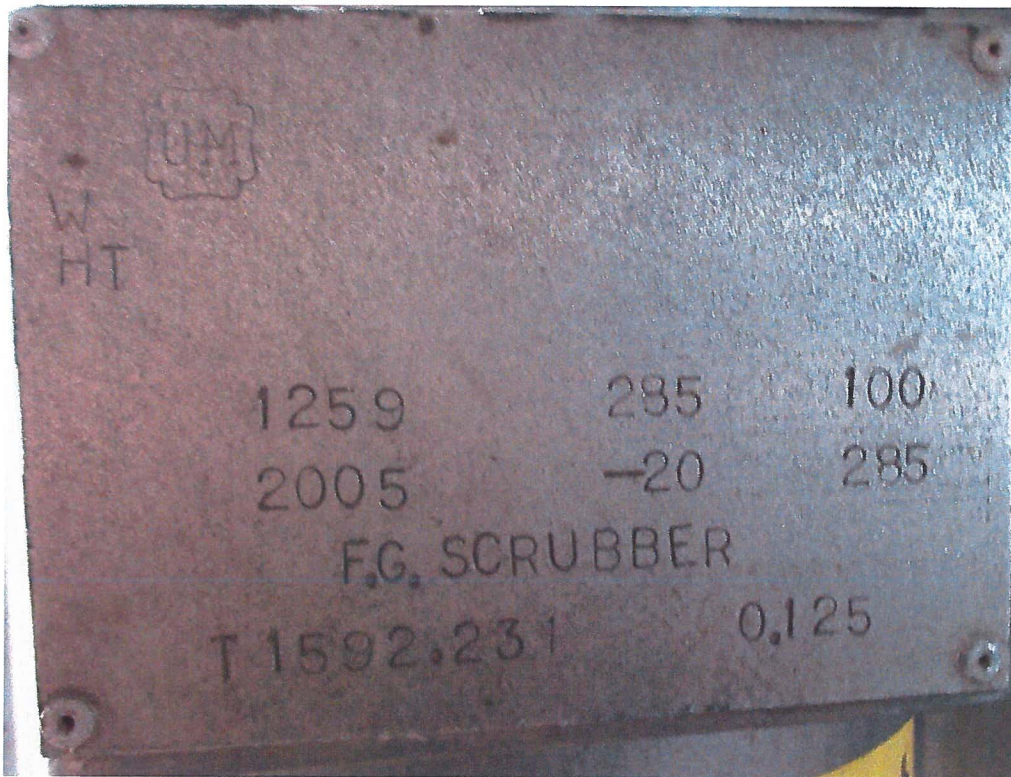
Approximate Date built or installed (check associated equipment or info at facility) _____

Any other pertinent information: _____

PRESSURE VESSEL INVENTORY FORM

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-3 ☐ 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: 01/07/2013

*Revised 2-2016

API 510 PRESSURE VESSEL EXTERNAL INSPECTION REPORT

Company Name: FMC Technologies Completion	
Field/Location: Grand Junction	
Equipment Number: HS-0030	Eq/Circ. ID: HS0030-FGS
Equipment Name/Service: Fuel Gas Scrubber	
Physical Location: RDI Yard	
Manufacturer: Micoda (Not legible on nameplate)	Manufacturer Serial #: 1259
Year Built: 2005	National Board #: None (UM Stamped)
Alberta Registration #: None	Canadian Registration #: T1592.231

Reason for Inspection: Scheduled API-510 External Inspection

Condition of Nameplate and/or Bracket: Nameplate is not legible. The nameplate bracket is securely attached. Nameplate lettering is worn off.

Internal Access: No

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

Grounding Device in Place and Secure?: N/A

Condition of Foundation and Anchor Bolts: There are no anchor bolts. The support skirt is welded to a baseplate, which is welded to the skid/trailer deck/frame. Baseplate-to-deck/frame attachment welds appear sound.

Condition of Steel Supports, Saddles, and Bolting: The skirt-to-head attachment weld has no visual weld defects. All support structural welds appear sound. Access holes in support skirt are showing moderate corrosion and scaling.

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. Vessel is not in service. The threaded connections appear acceptable.

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

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): 02/2016

Comments:

The vessel was not in service at the time of this inspection.

Recommendations:

Repairs Needed:

Robert W. Menke/BGW/MK

API 510 Inspector Signature

0131

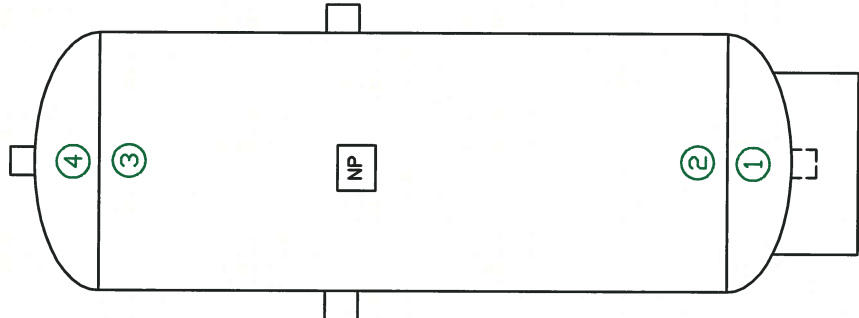
API 510 Inspector Number

09/26/2018

Date

EQUIP RETIREMENT DATE: 9/5/2085
NEXT INSPECTION IS DUE: 9/26/2019

- #1. 01- BTM HD-FRONT 0. 318 TC
- #1. 02- BTM HD-LEFT 0. 319 TC
- #1. 03- BTM HD-BACK 0. 314 TC
- #1. 04- BTM HD-RIGHT 0. 327 TC
- #2. 01- BTM SHELL-FRONT 0. 302 TC
- #2. 02- BTM SHELL-LEFT 0. 304 TC
- #2. 03- BTM SHELL-BACK 0. 307 TC
- #2. 04- BTM SHELL-RIGHT 0. 332 TC
- #3. 01- TOP SHELL-FRONT 0. 303 TC
- #3. 02- TOP SHELL-LEFT 0. 310 TC
- #3. 03- TOP SHELL-BACK 0. 311 TC
- #3. 04- TOP SHELL-RIGHT 0. 328 TC
- #4. 01- TOP HD-FRONT 0. 287 TC
- #4. 02- TOP HD-LEFT 0. 286 TC
- #4. 03- TOP HD-BACK 0. 284 TC
- #4. 04- TOP HD-RIGHT 0. 280 TC



TC-560

NAMEPLATE INFO	
MFG	MICODA PROCESS SYSTEMS
SERIAL NUMBER	1259
NATIONAL BOARD #	NONE
DATE BUILT	2005
DESIGN P & T	285 PSI @ 100°F
NOTE	UM STAMPED CRN T1592. 231

CAL BLK: 76°F	VESSEL: 64°F
BUSINESS UNIT	FMC TECHNOLOGIES COMPLETION
EQ/CIRC ID #	HS0030-FGS
EQUIP NAME	VERTICAL FUEL GAS SCRUBBER
LOCATION	INSIDE SKID UNIT HS-0030
DWG #	HS0030-FGS

DESC: FUEL GAS SCRUBBER
DWG#: HS0030-FGS-1.01-4.04

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: 10/31/2018

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

Unit: HS-0030

Eq/Circ ID: HS0030-FGS

Eq Type: VESSEL

Class:

CM RBI:

Design Code: S8/D1

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

Description: VERT. FUEL GAS SCRUBBER-SN:1259

Summary: Group Name:

Insp. Due Date = 09/26/2019

Pred. Ret. Date = 09/05/2085

Group Description:

RCR = 1.9 MPY

Rem. Life (from last survey 09/26/2018) = 66.9 Yrs

O C.A. Status: NO

Total Caution TMLs = 0

TM L No	Location	Ctn	First Survey Thick	First Nt	First Date	Previous Survey Thick	Previous Nt	Previous Date	Last Survey Thick	Last Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TM L Retirement Date	TM L Inspection Date
1.01	BTM HD-FRONT	N	0.333 TC	TC	11/14/2007	0.316 RR	RR	02/15/2016	0.318 TC	TC	09/26/2018	0	1.4	2.0	8.6	0.193 S	1.4	11/18/2107	09/26/2019
1.02	BTM HD-LEFT	N *	0.335 TC	TC	11/14/2007	0.318 TC	TC	02/15/2016	0.318 RR	RR	09/26/2018	0	1.6	1.7	5.7	0.193 S	1.6	11/10/2096	09/26/2019
1.03	BTM HD-BACK	N	0.328 TC	TC	11/14/2007	0.316 TC	TC	02/15/2016	0.314 TC	TC	09/26/2018	0.8	1.3	1.3	5.7	0.193 S	1.3	10/25/2111	09/26/2019
1.04	BTM HD-RIGHT	N	0.344 TC	TC	11/14/2007	0.328 TC	TC	02/15/2016	0.327 TC	TC	09/26/2018	0.4	1.6	1.8	4.2	0.193 S	1.6	06/28/2102	09/26/2019
2.01	BTM SHELL-FRONT	N	0.315 TC	TC	11/14/2007	0.302 TC	TC	02/15/2016	0.302 TC	TC	09/26/2018	0	1.2	1.0	3.4	0.193 S	1.2	05/28/2109	09/26/2019
2.02	BTM SHELL-LEFT	N *	0.314 TC	TC	11/14/2007	0.310 RR	RR	02/15/2016	0.304 TC	TC	09/26/2018	2.3	0.9	0.7	7.9	0.193 S	2.3	12/30/2066	09/26/2019
2.03	BTM SHELL-BACK	N *	0.325 TC	TC	11/14/2007	0.307 RR	RR	02/15/2016	0.307 TC	TC	09/26/2018	0	1.7	1.1	5.7	0.193 S	1.7	10/17/2085	09/26/2019
2.04	BTM SHELL-RIGHT	N	0.345 TC	TC	11/14/2007	0.331 TC	TC	02/15/2016	0.331 RR	RR	09/26/2018	0	1.3	0.8	4.5	0.193 S	1.3	11/22/2124	09/26/2019
3.01	TOP SHELL-FRONT	N	0.310 TC	TC	11/14/2007	0.297 RR	RR	02/15/2016	0.300 RR	RR	09/26/2018	0	0.9	1.1	6.8	0.193 S	0.9	08/17/2137	09/26/2019
3.02	TOP SHELL-LEFT	N	0.323 TC	TC	11/14/2007	0.303 RR	RR	02/15/2016	0.310 TC	TC	09/26/2018	0	1.2	1.6	5.0	0.193 S	1.2	03/28/2116	09/26/2019
3.03	TOP SHELL-BACK	N	0.316 TC	TC	11/14/2007	0.312 TC	TC	02/15/2016	0.311 TC	TC	09/26/2018	0.4	0.5	0.1	3.1	0.193 S	0.5	09/28/2254	09/26/2019
3.04	TOP SHELL-RIGHT	N *	0.350 TC	TC	11/14/2007	0.329 RR	RR	02/15/2016	0.328 TC	TC	09/26/2018	0.4	2.0	1.7	5.4	0.193 S	2.0	03/27/2086	09/26/2019
4.01	TOP HD-FRONT	N	0.295 TC	TC	11/14/2007	0.290 TC	TC	02/15/2016	0.287 TC	TC	09/26/2018	1.1	0.7	0.4	2.5	0.193 S	1.1	03/11/2104	09/26/2019
4.02	TOP HD-LEFT	N	0.295 TC	TC	11/14/2007	0.287 RR	RR	02/15/2016	0.286 TC	TC	09/26/2018	0.4	0.8	0.6	1.7	0.193 S	0.8	12/27/2134	09/26/2019
4.03	TOP HD-BACK	N *	0.296 TC	TC	11/14/2007	0.282 RR	RR	02/15/2016	0.284 TC	TC	09/26/2018	0	1.1	1.3	7.6	0.193 S	1.1	06/19/2101	09/26/2019
4.04	TOP HD-RIGHT	N *	0.296 TC	TC	11/14/2007	0.280 RR	RR	02/15/2016	0.280 TC	TC	09/26/2018	0	1.5	1.4	3.3	0.193 S	1.5	09/26/2076	09/26/2019

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

Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: HS0030-FGS
Design Code: S8/D1
Eq Type: VESSEL
Class:
CM RBI:

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

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

Description: VERT. FUEL GAS SCRUBBER-SN:1259

TWM 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	:	1.3 MPY	
(B) -- Average Max 25.0% of TWMs, Min of 2	:	1.9 MPY	
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	1.7 MPY	
(D) -- Default Corrosion Rate	:	0.1 MPY	
Representative Corrosion Rate = 1.9 MPY			

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

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

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

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

TWM Inspection Interval is:
(A) -- 1.00 Years.

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

Eq/Circ ID Estimated life = 66.9 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TWM retirement dates.)

Predicted Eq/Circ ID Retirement date is 09/05/2085

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
UT/RT Inspection Interval is 1.00 years.

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

FORM U-3 MANUFACTURER'S CERTIFICATE OF COMPLIANCE
COVERING PRESSURE VESSELS TO BE STAMPED WITH THE UM SYMBOL, SEE U-1(j)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by MICODA PROCESS SYSTEMS INC., 1211 - 8A STREET NISKU, ALBERTA T9E 7R3 CANADA
(Name and address of Manufacturer)

Manufactured for Pure Energy Services LTD. #300, 1010-1st S.W. Calgary Alberta, Canada T2K-1KA
(Name and address of Purchaser)

3. Location of installation Portable
(Name and address)

4. Type Vertical Fuel Gas Scrubber 1.00 cu/ft 1259
(Horz., vert., or sphere) (Tank, separator, etc.) (Capacity) (Mfg's. serial No.)
T 1592.23 FGS-47 Rev. 0 2005
(CRN) (Drawing No.) (Year built)

5. ASME Code, Section VIII, Div. 1 2004 Edd. N/A
(Edition and Addenda (date)) (Code Case No.)

6. Shell		(a) No. of course(s):		1		(b) Overall length (ft & in.):		2'-6" S/S									
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	8.625" OD	2'-6" S/S	SA 106-B	0.322"	0.125"	Smls	N/A			1	1		None		0.70	1150F	1 hr.
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

7. Heads: (a) SA 234-WPB 1150F for 1hr (b) SA 234-WPB 1150F for 1hr
(Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.) (Mat'l Spec. No., 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)	Top	0.210"	0.125"	N/A	N/A	2:1	N/A	N/A	N/A	No	Yes	N/A	N/A	N/A
(b)	Bottom	0.210"	0.125"	N/A	N/A	2:1	N/A	N/A	N/A	No	Yes	N/A	N/A	N/A

If removable, bolts used (describe other fastening) _____
(Mat'l Spec. No., Grade, Size, No.)

8. Type of Jacket _____ Jacket Closure _____
(Describe as ogee & weld, bar, etc.)

If bar, give dimensions; if bolted describe or sketch _____

9. MAWP 285 - psi at max. temp. 100 - °F. Min. design metal temp. -20 °F at 285 psi.
(internal) (external) (internal) (external)

10. Impact test No; per UG-20(f)1-5 at test temperature of - °F.
[Indicate yes or no and the component(s) impact tested]

11. Hydro., ~~proof~~, ~~hydro~~ test press. 371 Proof test -

12. 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	
Inlet	2	1"	CPLG	SA 105-N	N/A	CI-3000	0.125"	N/A	UW-16.1(a)	N/A	Shell
HLSD	1	2"	CPLG	SA 105-N	N/A	CI-3000	0.125"	N/A	UW-16.1(a)	N/A	Head
Drain	1	1"	CPLG	SA 105-N	N/A	CI-6000	0.125"	N/A	UW-16.1(a)	N/A	Head
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

13. Supports: Skirt Yes Lugs N/A Legs N/A Others N/A Attached Welded to Head
(Yes or no) (No.) (No.) (Describe) (Where and how)

14. 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)

15. Remarks: -

Construction Dwg. 05-603-V Rev. 0

PSV to be installed in the piping system by others

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.

UM Certificate of Authorization No. 34564 Expires 7/10/2005

Date 6/21/2005 Name MICODA PROCESS SYSTEMS INC. Signed _____
(Manufacturer) (Representative)

Signed _____
(Certified Individual)

API 570 Piping External Inspection

Company Name: FMC Technologies Completion	Facility Name: Grand Junction
Line Name/Number: Associated Piping with HS-0030	
Size/Sched. Of Pipe: 1.000";6.000"	Eq/Circ. ID:
Service/System:	Piping Class ☐ 1 ☒ 2 ☐ 3 ☐ Other
Design Pressure: 2000 psi	Materials: ☒ CS ☐ SS ☐ Other
Design Temperature: 200°	Note Stamping (If Any)
P&ID#:	Flange Rating: 900#/150# PSV

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

☒ Scheduled API-570 External Inspection. ☐ Other:

Comments: Tighten/repair support brackets. Plug threaded valves

Testing Performed:

☒ Visual ☒ UT ☐ PT ☐ MT ☐ Other:

Insulation Observations:	Comments:
☐ Serviceable ☒ Not Insulated ☐ Missing/Damaged ☐ CUI Identification ☐ Corrosion Present (Describe) ☐ Other ☒ No Issues	Piping is not insulated.

Coating Condition:	Comments:
☒ Good ☒ Fair, Some Blistering/Peeling ☒ Corrosion Present (Describe) ☐ Other ☐ No Issues	There is minor chipping, scratched and missing coating with light surface corrosion present.

Loss of Containment:	Comments:
☐ Fluid Loss (Indicate How Much) ☐ Seeping or Evidence of Past Leakage ☐ Dripping (Size of Drops/Drops Per Minute) ☐ Leaking (Size of Stream, Noise Level, etc.) ☐ Clamps ☐ Other ☒ None Identified	No signs of past leaks. The unit was not in service at time of inspection.

Condition of Welds:	Comments:
☒ Welds Are Full, Smooth and Well Profiled ☐ Incomplete Fusion/Penetration ☐ Crack Located Near Weld Seam ☐ Weld Does Not Appear to Be Original ☐ Joints-Misaligned ☐ Undercut ☐ Other ☒ No Issues	Welds are visually acceptable with no visible defects.

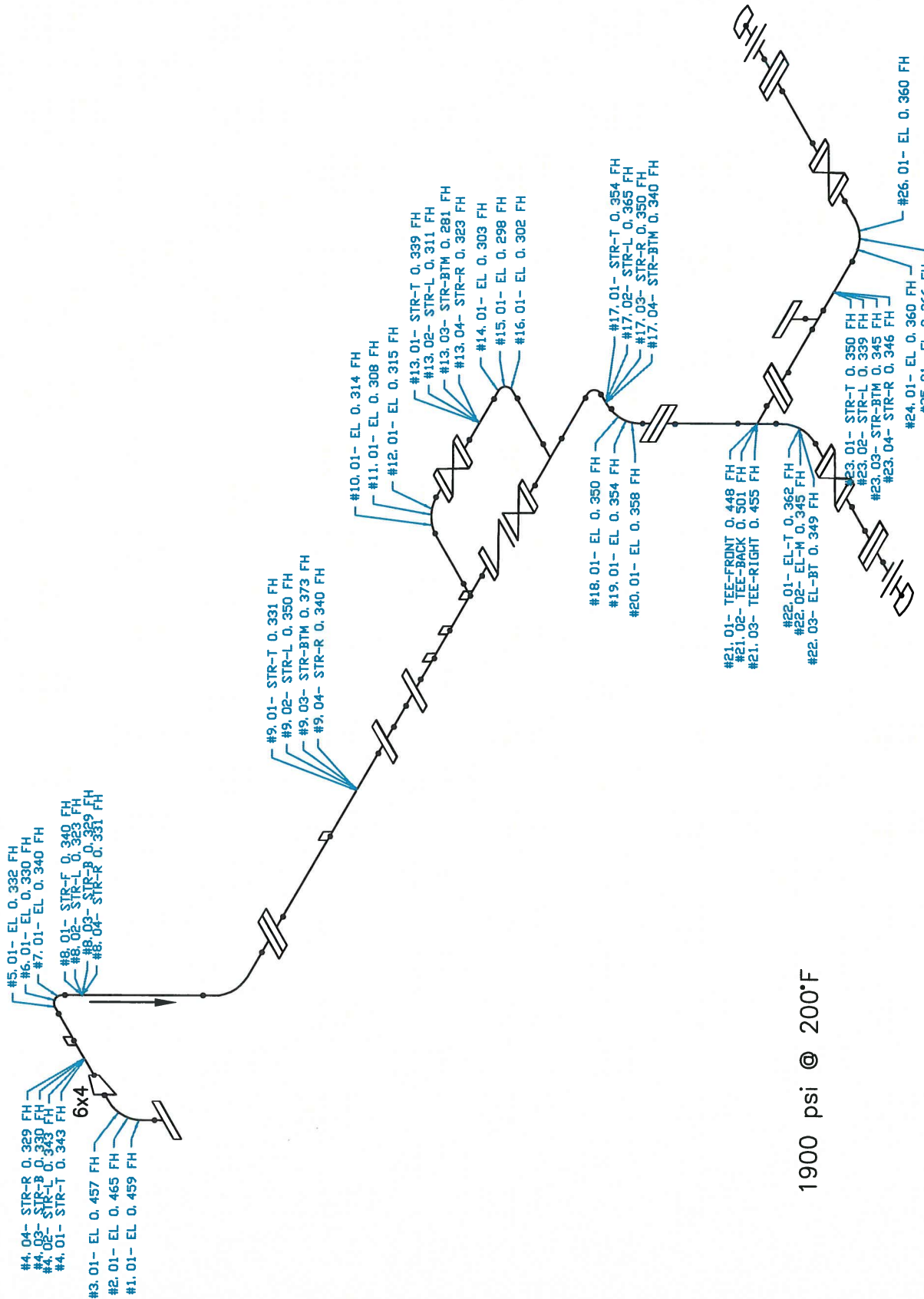
Relief Device:	Comments:
☒ PSV ☐ No PSV ☐ Rupture Disk ☒ Atmospheric ☐ No Relief Device Identified For This Equipment ☒ Tag Secure and Legible ☒ Set Pressure At Or Below MAWP ☐ Block Valve Not Locked/Car Sealed In Open Position ☐ Improper Drain Hole/Weather Cap On Atmos. Discharge ☐ Obstruction (i.e. Debris) ☐ Relief Installed In A Position Other Than Horiz. Or Upright ☐ Other ☒ No Issues	The PSV's are set at 2000 & 2160 psi Tested on 02/2016.

Supports/Hangers:	Comments:
☒ In Serviceable Condition ☐ Foundation Is Damaged ☐ Additional Support Needed ☒ Hanger/Support Is Distorted/Broken/Missing ☐ Pipe Slide Or Shoe Is Off Of The Support ☐ Makeshift Support ☒ Loose Support Needed To Be Tightened ☐ Fireproofing Missing Or Damaged ☐ Support/Hanger Is Corroded ☒ Other ☒ No Issues	Majority of brackets and vertical supports are acceptable. Light surface corrosion is present. Loose brackets and missing bolts (pg. 2,3 & 6). Broken bracket for 2" line (pg. 3). Tighten and repair loose and broken support brackets.

Flanged Connections:	Comments:
☒ Bolting Serviceable ☐ Short, Missing Or Damaged Bolting ☒ Nuts Lack Full Engagement ☒ Flanges Serviceable ☐ Flange Material Or Rating Inconsistent For System ☐ Flanges Deformed Or Damaged ☒ Corrosion Present (Describe) ☒ Gaskets ☐ Flange Rating Issues ☐ Other ☒ No Issues	Bolts and flanges are acceptable. Light Surface corrosion present. (1) bolt lacks full engagement. (pg. 5).

Mechanical Observations:	Comments:
☒ Deadleg ☐ Damaged Flex Hose ☐ Crack ☐ Biological Growth ☐ Threaded Exposed ☐ Threaded Connections Not Seal Welded ☐ Expansion Joint Issues ☐ Low Point Without Drain ☐ Open Ended ☐ Vibration (Excessive) ☐ Weephole ☒ Other ☐ No Issues	End caps, vents and drains are present with no visible issues. PSV line appears to have shifted (adjust supports to allow pipe back to original position). Minor damage and deformed hammer unions.

EQUIP RETIREMENT DATE: 5/20/2048
NEXT INSPECTION IS DUE: 9/26/2019



HS0030-P1

DESC: GAS OUT-6,4,3 IN SCH 80
DWG#: GAS-OUT-1.01-26.01

FH2E-D

PIPING 62-63°F
CAL BLK 70°F

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: GAS OUT
Eq Type: PIPING
Class:
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 1900 lb/in²
Design Temperature: 200 °F

Description: 6,3,4 IN SCH80 - GAS OUT PIPING

Summary: Group Name:
Insp. Due Date = 09/26/2019
Pred. Ret. Date = 05/20/2048

Group Description:
RCR = 4.2 MPY
Rem. Life (from last survey 09/26/2018) = 29.6 yrs

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

TML No	Location	Ctn	First Survey Thick	First Date	Previous Survey Thick	Previous Date	Last Survey Thick	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	EL	N	0.469	11/14/2007	0.458 D5	02/15/2016	0.458 RR	09/26/2018	0	1.0	1.2	4.5	0.303 P	1.0	07/28/2173	09/26/2019
2.01	EL	N	0.480	11/14/2007	0.462 D5	02/15/2016	0.462 RR	09/26/2018	0	1.7	1.8	3.8	0.303 P	1.7	03/03/2112	09/26/2019
3.01	EL	N	0.480	11/14/2007	0.449 D5	02/15/2016	0.449 RR	09/26/2018	0	2.9	2.7	15.1	0.303 P	2.9	01/08/2069	09/26/2019
4.01	STR-T	N	0.364	11/14/2007	0.340 D5	02/15/2016	0.340 RR	09/26/2018	0	2.2	2.5	4.6	0.206 P	2.2	09/06/2079	09/26/2019
4.02	STR-L	N	0.353	11/14/2007	0.323 D5	02/15/2016	0.323 RR	09/26/2018	0	2.8	2.5	25.4	0.206 P	2.8	07/19/2060	09/26/2019
4.03	STR-B	N	0.347	11/14/2007	0.326 D5	02/15/2016	0.326 RR	09/26/2018	0	1.9	1.5	19.8	0.206 P	1.9	12/07/2081	09/26/2019
4.04	STR-R	N *	0.364	11/14/2007	0.339 D5	02/15/2016	0.329 FH	09/26/2018	3.8	3.2	3.4	10.5	0.206 P	3.8	02/15/2051	09/26/2019
5.01	EL	N	0.363	11/14/2007	0.328 D5	02/15/2016	0.328 RR	09/26/2018	0	3.2	3.4	9.6	0.206 P	3.2	11/19/2056	09/26/2019
6.01	EL	N	0.352	11/14/2007	0.325 D5	02/15/2016	0.325 RR	09/26/2018	0	2.5	2.6	10.4	0.206 P	2.5	05/14/2066	09/26/2019
7.01	EL	N *	0.364	11/14/2007	0.328 D5	02/15/2016	0.328 RR	09/26/2018	0	3.3	3.2	6.8	0.206 P	3.3	09/23/2055	09/26/2019
8.01	STR-F	N	0.353	11/14/2007	0.335 D5	02/15/2016	0.335 RR	09/26/2018	0	1.7	1.8	7.5	0.206 P	1.7	08/30/2094	09/26/2019
8.02	STR-L	N *	0.356	11/14/2007	0.333 D5	02/15/2016	0.323 FH	09/26/2018	3.8	3.0	2.5	9.4	0.206 P	3.8	07/18/2049	09/26/2019
8.03	STR-B	N	0.351	11/14/2007	0.328 D5	02/15/2016	0.328 RR	09/26/2018	0	2.1	2.2	7.5	0.206 P	2.1	11/12/2076	09/26/2019
8.04	STR-R	N *	0.356	11/14/2007	0.340 D5	02/15/2016	0.331 FH	09/26/2018	3.4	2.3	2.0	4.5	0.206 P	3.4	07/10/2055	09/26/2019
9.01	STR-T	N *	0.392	11/14/2007	0.339 RR	02/15/2016	0.331 FH	09/26/2018	3.1	5.6	6.5	38.2	0.206 P	5.6	01/26/2041	09/26/2019
9.02	STR-L	N	0.345	11/14/2007	0.331 D5	02/15/2016	0.331 RR	09/26/2018	0	1.3	1.0	9.4	0.206 P	1.3	12/13/2114	09/26/2019
9.03	STR-BTM	N	0.345	11/14/2007	0.333 D5	02/15/2016	0.333 RR	09/26/2018	0	1.1	0.4	8.5	0.206 P	1.1	04/06/2134	09/26/2019
9.04	STR-R	N	0.368	11/14/2007	0.333 RR	02/15/2016	0.340 FH	09/26/2018	0	2.6	3.1	12.4	0.206 P	2.6	04/21/2070	09/26/2019
10.01	EL	N	0.317	11/14/2007	0.298 RR	02/15/2016	0.314 FH	09/26/2018	0	0.3	0.9	12.0	0.160 P	0.3	07/15/2531	09/26/2019
11.01	EL	N	0.318	11/14/2007	0.302 RR	02/15/2016	0.305 RR	09/26/2018	0	1.2	1.4	9.0	0.160 P	1.2	06/09/2139	09/26/2019

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:10/31/2018

(Report in Inches, Corrosion Rates in MPY)

Analysis: Straight Line

Unit: HS-0030
Eq/Circ ID: GAS OUT
Eq Type: PIPING
Class:
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 1900 lb/in²
Design Temperature: 200 °F

Description: 6,3,4 IN SCH80 - GAS OUT PIPING

Summary:

Group Description:

Insp. Due Date = 09/26/2019

RCR = 4.2 MPY

Pred. Ret. Date = 05/20/2048

Rem. Life (from last survey 09/26/2018) = 29.6 yrs

0 C.A. Status: No

Total Caution TMLs = 0

TML No	Location	Ctn	First Survey Thick	First Date	Previous Survey Thick	Previous Date	Last Survey Thick	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
12.01	EL	N	0.328	11/14/2007	0.303 D5	02/15/2016	0.303 RR	09/26/2018	0	2.3	2.3	12.0	0.160 P	2.3	11/02/2080	09/26/2019
13.01	STR-T	N	0.349	11/14/2007	0.337 D5	02/15/2016	0.337 RR	09/26/2018	0	1.1	1.1	6.0	0.160 P	1.1	07/02/2179	09/26/2019
13.02	STR-L	N	0.319	11/14/2007	0.312 RR	02/15/2016	0.311 FH	09/26/2018	0.4	0.7	0.7	3.0	0.160 P	0.7	03/22/2234	09/26/2019
13.03	STR-BTM	N	0.296	11/14/2007	0.280 RR	02/15/2016	0.281 FH	09/26/2018	0	1.4	1.5	9.0	0.160 P	1.4	01/18/2105	09/26/2019
13.04	STR-R	N	0.337	11/14/2007	0.318 D5	02/15/2016	0.318 RR	09/26/2018	0	1.7	1.6	6.6	0.160 P	1.7	08/02/2111	09/26/2019
14.01	EL	N	0.311	11/14/2007	0.299 D5	02/15/2016	0.299 RR	09/26/2018	0	1.1	1.2	8.0	0.160 P	1.1	12/14/2144	09/26/2019
15.01	EL	N	0.305	11/14/2007	0.297 D5	02/15/2016	0.297 RR	09/26/2018	0	0.7	0.8	6.0	0.160 P	0.7	03/22/2214	09/26/2019
16.01	EL	N	0.306	11/14/2007	0.298 D5	02/15/2016	0.298 RR	09/26/2018	0	0.7	0.6	8.5	0.160 P	0.7	08/26/2215	09/26/2019
17.01	STR-T	N	0.366	11/14/2007	0.352 D5	02/15/2016	0.352 RR	09/26/2018	0	1.3	1.1	2.6	0.206 P	1.3	02/07/2131	09/26/2019
17.02	STR-L	N	0.373	11/14/2007	0.368 RR	02/15/2016	0.365 FH	09/26/2018	1.1	0.7	0.6	2.0	0.206 P	1.1	05/09/2163	09/26/2019
17.03	STR-R	N	0.362	11/14/2007	0.345 RR	02/15/2016	0.350 FH	09/26/2018	0	1.1	1.4	8.0	0.206 P	1.1	09/18/2149	09/26/2019
17.04	STR-BTM	N	0.339	11/14/2007	0.333 D5	02/15/2016	0.333 RR	09/26/2018	0	0.6	0.9	10.5	0.206 P	0.6	07/14/2230	09/26/2019
18.01	EL	N	0.359	11/14/2007	0.346 D5	02/15/2016	0.346 RR	09/26/2018	0	1.2	1.0	4.0	0.206 P	1.2	06/20/2135	09/26/2019
19.01	EL	N	0.356	11/14/2007	0.347 D5	02/15/2016	0.347 RR	09/26/2018	0	0.8	0.8	5.6	0.206 P	0.8	01/31/2195	09/26/2019
20.01	EL	N	0.367	11/14/2007	0.355 D5	02/15/2016	0.355 RR	09/26/2018	0	1.1	1.2	6.7	0.206 P	1.1	04/06/2154	09/26/2019
21.01	TEB-FRONT	N	0.459	11/14/2007	0.446 D5	02/15/2016	0.446 RR	09/26/2018	0	1.2	1.0	4.7	0.206 P	1.2	10/21/2218	09/26/2019
21.02	TEB-BACK	N	0.459	11/14/2007	0.446 RR	02/15/2016	0.457 RR	09/26/2018	0	0.2	0.2	3.1	0.206 P	0.2	02/19/3274	09/26/2019
21.03	TEB-RIGHT	N *	0.508	11/14/2007	0.490 RR	02/15/2016	0.455 FH	09/26/2018	13.4	4.9	4.0	13.4	0.206 P	13.4	04/28/2037	09/26/2019
22.01	EL-T	N	0.353	11/14/2007	0.335 RR	02/15/2016	0.361 RR	09/26/2018	0	0	0.8	22.0	0.206 P	0.1	07/09/3569	09/26/2019
22.02	EL-M	N	0.349 D5	02/15/2016		N/A	0.345 FH	09/26/2018	N/A	1.5	N/A	1.5	0.206 P	1.5	06/16/2111	09/26/2019
22.03	EL-BT	N	0.335 D5	02/15/2016		N/A	0.335 RR	09/26/2018	N/A	0	N/A	0	0.206 P	0.1	07/07/3309	09/26/2019

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: GAS OUT
Eq Type: PIPING
Class:
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 1900 lb/in²
Design Temperature: 200 °F

Description: 6, 3, 4 IN SCH80 - GAS OUT PIPING

Summary: Group Name: Group Description: RCR = 4.2 MPY Rem. Life (from last survey 09/26/2018) = 29.6 yrs 0 C.A. Status: NO Total Caution TMLs = 0
Insp. Due Date = 09/26/2019
Pred. Ret. Date = 05/20/2048

TM L 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	TM L Retirement Date	TM L Inspection Date
23.01	STR-T	N	0.359	11/14/2007	0.344 D5	02/15/2016	0.344 RR	09/26/2018	0	1.4	1.2	12.2	0.206 P	1.4	05/13/2117	09/26/2019
23.02	STR-L	N	0.359	11/14/2007	0.335 D5	02/15/2016	0.335 RR	09/26/2018	0	2.2	2.3	5.7	0.206 P	2.2	05/28/2077	09/26/2019
23.03	STR-BTM	N	0.349	11/14/2007	0.328 D5	02/15/2016	0.328 RR	09/26/2018	0	1.9	1.6	12.2	0.206 P	1.9	12/26/2082	09/26/2019
23.04	STR-R	N	0.368	11/14/2007	0.336 D5	02/15/2016	0.336 RR	09/26/2018	0	2.9	1.9	8.6	0.206 P	2.9	08/04/2063	09/26/2019
24.01	EL	N	0.359	11/14/2007	0.354 RR	02/15/2016	0.355 RR	09/26/2018	0	0.4	0.2	3.0	0.206 P	0.4	06/07/2391	09/26/2019
25.01	EL	N	0.359	11/14/2007	0.355 RR	02/15/2016	0.359 RR	09/26/2018	0	0	0.2	7.0	0.206 P	0.1	07/09/3549	09/26/2019
26.01	EL	N	0.364	11/14/2007	0.352 D5	02/15/2016	0.352 RR	09/26/2018	0	1.1	1.3	4.0	0.206 P	1.1	07/15/2151	09/26/2019

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

Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: GAS OUT
Design Code: B31.3
Eq Type: PIPING
Class:
CM RBI:

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

Flange Rating: 2025 lb/in²
Design Pressure: 1900 lb/in²
Design Temperature: 200 °F

Description: 6,3,4 IN SCH80 - GAS OUT PIPING

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 : 1.9 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 4.2 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 2.3 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 4.2 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).

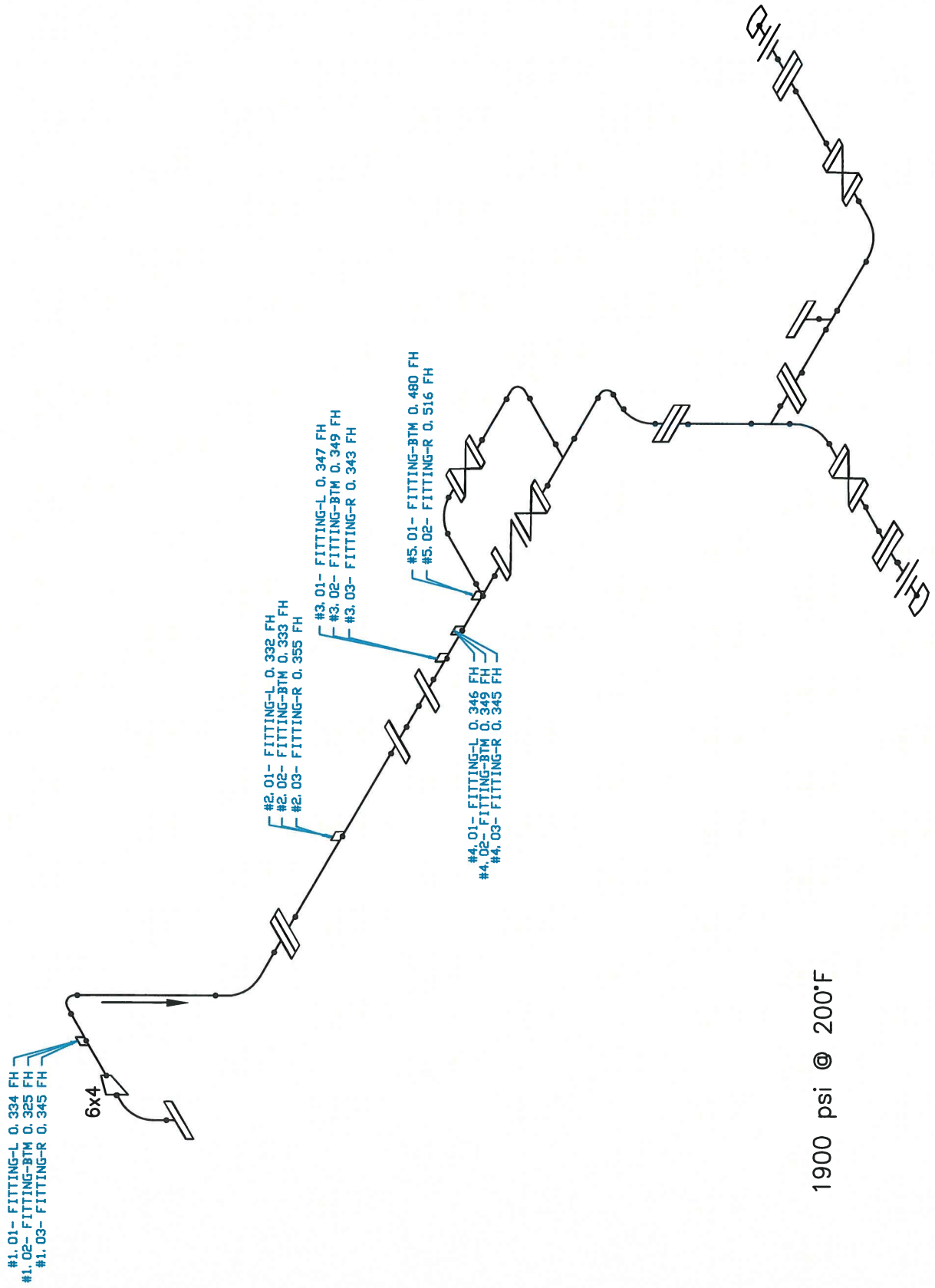
Eq/Circ ID Estimated life = 29.6 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 05/20/2048

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

EQUIP RETIREMENT DATE: 4/17/2050
NEXT INSPECTION IS DUE: 9/26/2019



HS0030-P1

DESC: 6,4,3 IN SCH 80 GAS OUT PIPING
DWG#: GAS-OUT-SP-1.01-5.02

FH2E-D

PIPING 62°F
CAL BLK 70°F

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:10/31/2018

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

Unit: HS-0030
Eq/Circ ID: GAS OUT-SP
Eq Type: PIPING
Class:
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 1900 lb/in²
Design Temperature: 200 °F

Description: 6,3,4 IN SCH80 - GAS OUT PIPING

Summary:

Group Description:

Insp. Due Date = 09/26/2019
Pred. Ret. Date = 04/17/2050

RCR = 6.2 MPY
Rem. Life (from last survey 09/26/2018) = 31.6 yrs

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

TML No	Location	Ctn	First Survey Thick	First Date	Previous Survey Thick	Previous Date	Last Survey Thick	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	FITTING-L	N *	0.349	01/24/2014	0.330 D5	02/15/2016	0.330 RR	09/26/2018	0	4.1	4.5	17.9	0.206 P	4.1	12/30/2048	09/26/2019
1.02	FITTING-BTM	N	0.337	01/24/2014	0.329 D5	02/15/2016	0.325 FH	09/26/2018	1.5	2.6	2.8	7.5	0.206 P	2.6	07/14/2064	09/26/2019
1.03	FITTING-R	N *	0.364	01/24/2014	0.353 D5	02/15/2016	0.345 FH	09/26/2018	3.1	4.1	3.9	7.0	0.206 P	4.1	08/28/2052	09/26/2019
2.01	FITTING-L	N	0.343	01/24/2014	0.334 D5	02/15/2016	0.332 FH	09/26/2018	0.8	2.4	2.6	8.5	0.206 P	2.4	04/08/2071	09/26/2019
2.02	FITTING-BTM	N	0.328	01/24/2014	0.330 D5	02/15/2016	0.330 RR	09/26/2018	0	0	0	0	0.206 P	0.1	07/06/3259	09/26/2019
2.03	FITTING-R	N	0.345	01/24/2014	0.357 D5	02/15/2016	0.355 FH	09/26/2018	0.8	0	0	0.8	0.206 P	0.8	01/31/2205	09/26/2019
3.01	FITTING-L	N *	0.364	01/24/2014	0.349 D5	02/15/2016	0.347 FH	09/26/2018	0.8	3.6	3.8	11.3	0.206 P	3.6	12/03/2057	09/26/2019
3.02	FITTING-BTM	N	0.352	01/24/2014	0.345 D5	02/15/2016	0.345 RR	09/26/2018	0	1.5	1.7	6.6	0.206 P	1.5	06/16/2111	09/26/2019
3.03	FITTING-R	N *	0.360	01/24/2014	0.339 D5	02/15/2016	0.339 RR	09/26/2018	0	4.5	5.0	19.8	0.206 P	4.5	04/22/2048	09/26/2019
4.01	FITTING-L	N	0.353	01/24/2014	0.342 D5	02/15/2016	0.342 RR	09/26/2018	0	2.4	2.6	10.4	0.206 P	2.4	06/08/2075	09/26/2019
4.02	FITTING-BTM	N	0.347	01/24/2014	0.344 D5	02/15/2016	0.344 RR	09/26/2018	0	0.6	0.7	2.8	0.206 P	0.6	11/12/2248	09/26/2019
4.03	FITTING-R	N *	0.356	01/24/2014	0.334 D5	02/15/2016	0.334 RR	09/26/2018	0	4.7	5.2	20.7	0.206 P	4.7	12/26/2045	09/26/2019
5.01	FITTING-BTM	N *	0.524	01/24/2014	0.500 D5	02/15/2016	0.480 FH	09/26/2018	7.7	9.4	10.2	22.6	0.206 P	9.4	11/23/2047	09/26/2019
5.02	FITTING-R	N	0.493	01/24/2014	0.511 D5	02/15/2016	0.511 RR	09/26/2018	0	0	0	0	0.206 P	0.1	10/11/4018	09/26/2019

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

Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: GAS OUT-SP
Design Code: B31.3
Eq Type: PIPING
Class:
CM RBI:

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

Flange Rating: 2025 lb/in²
Design Pressure: 1900 lb/in²
Design Temperature: 200 °F

Description: 6,3,4 IN SCH80 - GAS OUT PIPING

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

Representative Corrosion Rate is the Maximum of:
(A) -- Average Corrosion Rate x 1.00 : 2.9 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 6.2 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 3.9 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 6.2 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 = 31.6 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

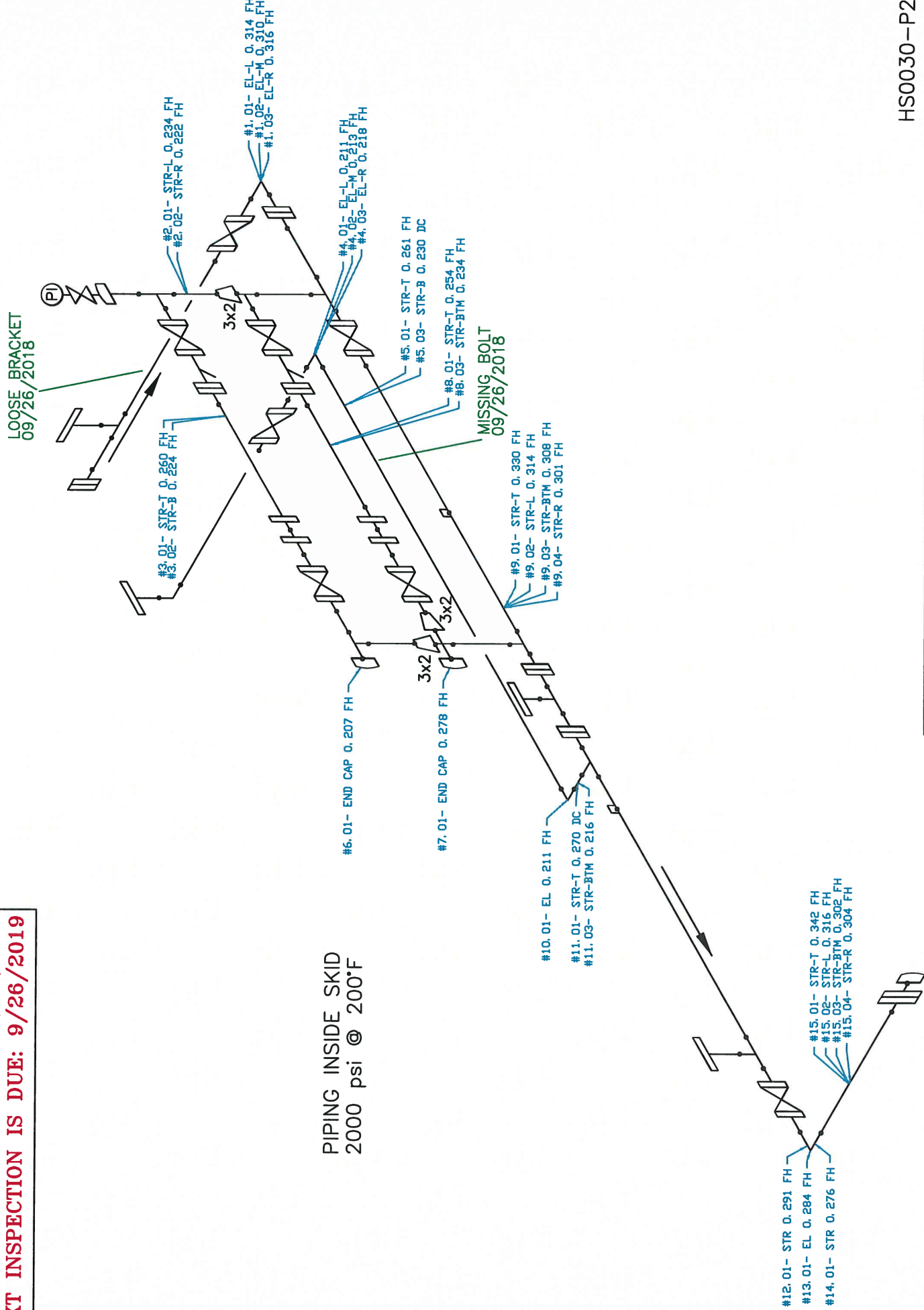
Predicted Eq/Circ ID Retirement date is 04/17/2050

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

EQUIP RETIREMENT DATE: 10/23/2049
 NEXT INSPECTION IS DUE: 9/26/2019

PIPING INSIDE SKID
 2000 psi @ 200°F



DESC: OIL OUT LINE-3,2 IN SCH 80
 DWG#: OIL-OUT-1.01-15.04

FH2E-D

HS0030-P2

PIPING 62-63°F
 CAL BLK 70°F

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:10/31/2018

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

Unit: HS-0030
Eq/Circ ID: OIL OUT
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: 2,3 INCH SCH 80 PIPE - OIL OUT LINE

Summary:

Group Name:

Insp. Due Date = 09/26/2019

Pred. Ret. Date = 10/23/2049

Group Description:

RCR = 4.0 MPY

Rem. Life (from last survey 09/26/2018) = 31.1 yrs

O 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	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	EL-L	N	0.328	11/14/2007	0.307 RR	02/15/2016	0.312 RR	09/26/2018	0	1.5	2.0	20.4	0.168 P	1.5	07/23/2114	09/26/2019
1.02	EL-M	N *	0.329	11/14/2007	0.302 RR	02/15/2016	0.303 RR	09/26/2018	0	2.4	2.3	6.7	0.168 P	2.4	11/15/2074	09/26/2019
1.03	EL-R	N	0.316	11/14/2007	0.305 D5	02/15/2016	0.305 RR	09/26/2018	0	1.0	1.0	13.6	0.168 P	1.0	06/21/2155	09/26/2019
2.01	STR-L	N	0.235	11/14/2007	0.231 D5	02/15/2016	0.231 RR	09/26/2018	0	0.4	0	8.5	0.120 S	0.4	03/29/2296	09/26/2019
2.02	STR-R	N	0.224	11/14/2007	0.222 RR	02/15/2016	0.222 FH	09/26/2018	0	0.2	0.2	4.5	0.120 S	0.2	09/30/2528	09/26/2019
3.01	STR-T	N	0.243	11/14/2007	0.235 D5	02/15/2016	0.235 RR	09/26/2018	0	0.7	0.6	12.4	0.120 S	0.7	01/09/2183	09/26/2019
3.02	STR-B	N	0.220	11/14/2007	0.215 RR	02/15/2016	0.216 RR	09/26/2018	0	0.4	0.4	6.8	0.120 S	0.4	09/28/2258	09/26/2019
4.01	EL-L	N *	0.216 D5	02/15/2016		N/A	0.211 FH	09/26/2018	N/A	1.9	N/A	1.9	0.114 P	1.9	09/10/2069	09/26/2019
4.02	EL-M	N	0.208 D5	02/15/2016		N/A	0.208 RR	09/26/2018	N/A	0	N/A	0	0.114 P	0.1	12/05/2956	09/26/2019
4.03	EL-R	N	0.203	04/16/2008	0.196 RR	02/15/2016	0.218 FH	09/26/2018	0	0	0	6.7	0.114 P	0.1	12/06/3056	09/26/2019
5.01	STR-T	N	0.258	11/14/2007	0.247 RR	02/15/2016	0.253 RR	09/26/2018	0	0.5	1.0	11.5	0.120 S	0.5	09/28/2284	09/26/2019
5.03	STR-B	N	0.214	11/14/2007	0.205 RR	02/15/2016	0.210 RR	09/26/2018	0	0.4	0.8	3.6	0.120 S	0.4	09/28/2243	09/26/2019
6.01	END CAP	N	0.206	11/14/2007	0.188 RR	02/15/2016	0.199 RR	09/26/2018	0	0.6	1.5	6.8	0.120 S	0.6	05/28/2150	09/26/2019
7.01	END CAP	N	0.272	11/14/2007	0.254 RR	02/15/2016	0.261 RR	09/26/2018	0	1.0	1.7	13.0	0.168 P	1.0	06/21/2111	09/26/2019
8.01	STR-T	N	0.249	11/14/2007	0.243 RR	02/15/2016	0.244 RR	09/26/2018	0	0.5	0.6	10.2	0.168 P	0.5	03/14/2170	09/26/2019
8.03	STR-BTM	N	0.228	11/14/2007	0.230 D5	02/15/2016	0.230 RR	09/26/2018	0	0	0	2.3	0.168 P	0.1	01/22/2636	09/26/2019
9.01	STR-T	N *	0.336	11/14/2007	0.238 D5	02/15/2016	0.238 RR	09/26/2018	0	9.0	8.2	86.6	0.114 P	9.0	06/29/2032	09/26/2019
9.02	STR-L	N	0.311	11/14/2007	0.308 D5	02/15/2016	0.308 RR	09/26/2018	0	0.3	0	3.6	0.114 P	0.3	10/22/2664	09/26/2019
9.03	STR-BTM	N	0.298	11/14/2007	0.296 D5	02/15/2016	0.296 RR	09/26/2018	0	0.2	0.3	9.0	0.114 P	0.2	11/04/2927	09/26/2019
9.04	STR-R	N	0.314	11/14/2007	0.305 RR	02/15/2016	0.301 FH	09/26/2018	1.5	1.2	1.0	9.0	0.114 P	1.5	04/14/2143	09/26/2019

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:10/31/2018

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

Unit: HS-0030
Eq/Circ ID: OIL OUT
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: 2,3 INCH SCH 80 PIPE - OIL OUT LINE

Summary:

Group Description:

Insp. Due Date = 09/26/2019
Pred. Ret. Date = 10/23/2049

RCR = 4.0 MPY

Rem. Life (from last survey 09/26/2018) = 31.1 yrs

O 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	Rest Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
10.01	EL	N	0.226	11/14/2007	0.201 RR	02/15/2016	0.211 FH	09/26/2018	0	1.4	1.9	5.2	0.114 P	1.4	11/22/2087	09/26/2019
11.01	STR-T	N *	0.279	11/14/2007	0.202 D5	02/15/2016	0.202 RR	09/26/2018	0	7.1	6.1	62.1	0.168 P	7.1	06/27/2023	09/26/2019
11.03	STR-BTM	N *	0.240	11/14/2007	0.209 D5	02/15/2016	0.209 RR	09/26/2018	0	2.9	1.3	12.2	0.168 P	2.9	10/12/2032	09/26/2019
12.01	STR	N	0.293	02/12/2009	0.282 RR	02/15/2016	0.288 RR	09/26/2018	0	0.5	0.6	5.0	0.168 P	0.5	03/15/2258	09/26/2019
13.01	EL	N	0.284	11/14/2007	0.277 RR	02/15/2016	0.279 RR	09/26/2018	0	0.5	0.4	8.0	0.168 P	0.5	03/15/2240	09/26/2019
14.01	STR	N	0.284	02/12/2009	0.276 D5	02/15/2016	0.276 FH	09/26/2018	0	0.8	0.1	5.6	0.168 P	0.8	05/27/2153	09/26/2019
15.01	STR-T	N	0.355	11/14/2007	0.340 D5	02/15/2016	0.340 RR	09/26/2018	0	1.4	1.4	4.8	0.168 P	1.4	05/27/2141	09/26/2019
15.02	STR-L	N	0.303	11/14/2007	0.300 RR	02/15/2016	0.307 RR	09/26/2018	0	0	0	4.0	0.168 P	0.1	01/27/3406	09/26/2019
15.03	STR-BTM	N	0.306	11/14/2007	0.291 D5	02/15/2016	0.291 RR	09/26/2018	0	1.4	1.0	4.8	0.168 P	1.4	05/28/2106	09/26/2019
15.04	STR-R	N *	0.335	11/14/2007	0.311 RR	02/15/2016	0.304 FH	09/26/2018	2.7	2.9	2.1	5.2	0.168 P	2.9	07/16/2065	09/26/2019

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

Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: OIL OUT
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM RBI:

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

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: 2,3 INCH SCH 80 PIPE - OIL OUT LINE

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 : 1.4 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 4.0 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 1.7 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 4.0 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).

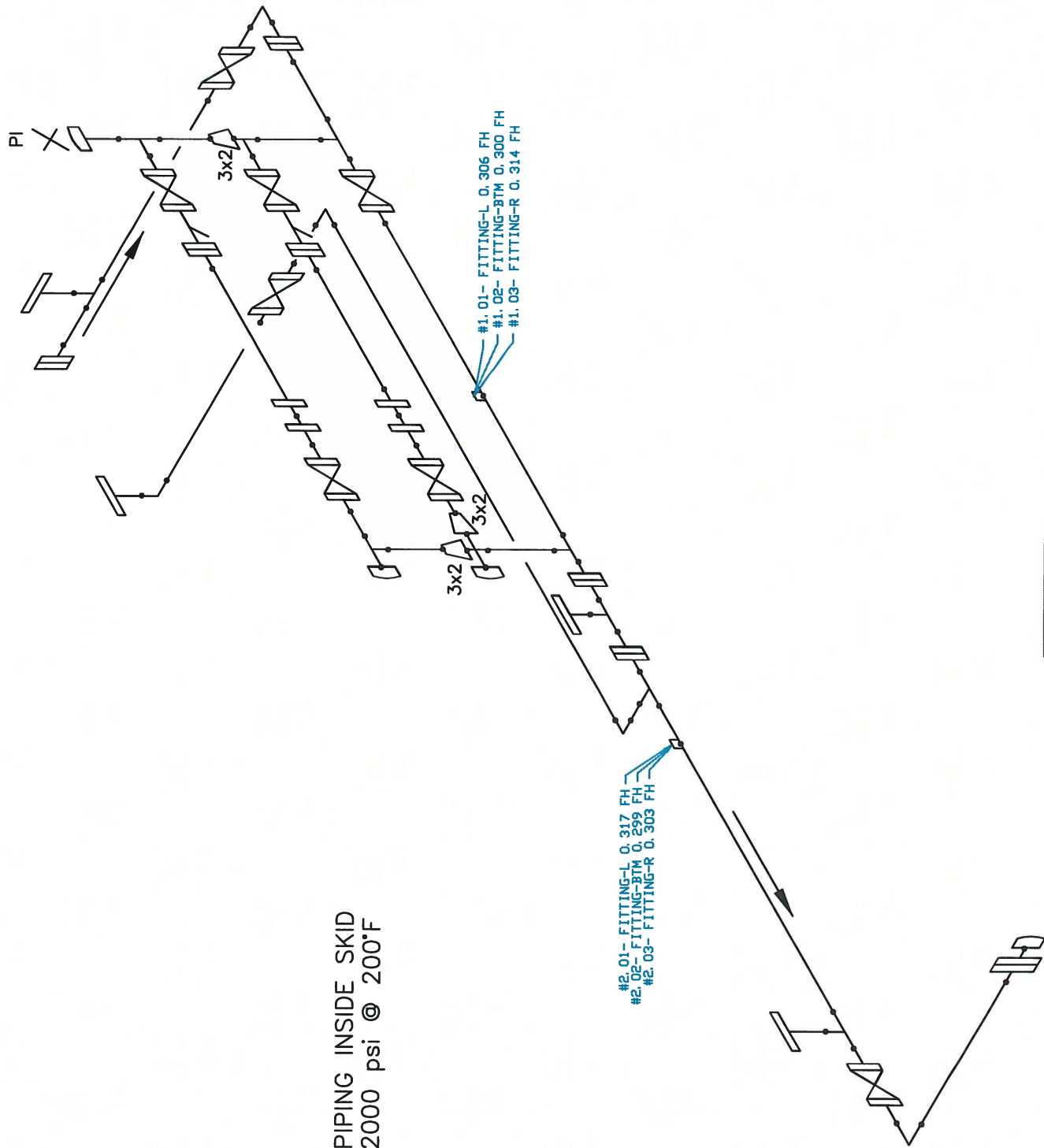
Eq/Circ ID Estimated life = 31.1 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 10/23/2049

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

EQUIP RETIREMENT DATE: 8/6/2099
 NEXT INSPECTION IS DUE: 9/26/2019



PIPING INSIDE SKID
 2000 psi @ 200°F

#2.01- FITTING-L 0.317 FH
 #2.02- FITTING-BTM 0.299 FH
 #2.03- FITTING-R 0.303 FH

#1.01- FITTING-L 0.306 FH
 #1.02- FITTING-BTM 0.300 FH
 #1.03- FITTING-R 0.314 FH

DESC: 3,2 IN SCH 80 - OIL OUT LINE
 DWG#: OIL-OUT-SP-1.01-2.03

PIPING 62°F
 CAL BLK 70°F

FH2E-D

HS0030-P2

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:10/31/2018

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

Unit: HS-0030
Eq/Circ ID: OIL OUT-SP
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: 2,3 INCH SCH 80 PIPE - OIL OUT LINE

Summary:

Group Name:

Insp. Due Date = 09/26/2019
Pred. Ret. Date = 08/06/2099

Group Description:
RCR = 3.9 MPY
Rem. Life (from last survey 09/26/2018) = 80.9 yrs

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

TML No	Location	Ctn TML	First Survey Thick	First Survey Nt	First Date	Previous Survey Thick	Previous Survey Nt	Previous Date	Last Survey Thick	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	FITTING-L	N *	0.318	0.318	01/24/2014	0.304	0.304 D5	02/15/2016	0.304	RR	0	3.0	2.5	11.0	0.114	P	01/03/2082	09/26/2019
1.02	FITTING-BTM	N *	0.305	0.305	01/24/2014	0.297	RR	02/15/2016	0.298	RR	0	1.5	1.0	8.0	0.114	P	04/14/2141	09/26/2019
1.03	FITTING-R	N *	0.315	0.315	01/24/2014	0.308	D5	02/15/2016	0.308	RR	0	1.5	1.1	7.0	0.114	P	12/14/2147	09/26/2019
2.01	FITTING-L	N *	0.318	0.318	01/24/2014	0.311	D5	02/15/2016	0.311	RR	0	1.5	1.6	5.6	0.168	P	11/22/2113	09/26/2019
2.02	FITTING-BTM	N *	0.294	0.294	01/24/2014	0.283	D5	02/15/2016	0.283	RR	0	2.4	2.5	9.4	0.168	P	07/17/2066	09/26/2019
2.03	FITTING-R	N *	0.318	0.318	01/24/2014	0.296	D5	02/15/2016	0.296	RR	0	4.7	3.9	17.1	0.168	P	11/29/2045	09/26/2019

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

Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: OIL OUT-SP
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM RBI:

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

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: 2,3 INCH SCH 80 PIPE - OIL OUT LINE

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 : 2.4 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 3.9 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 3.7 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 3.9 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).

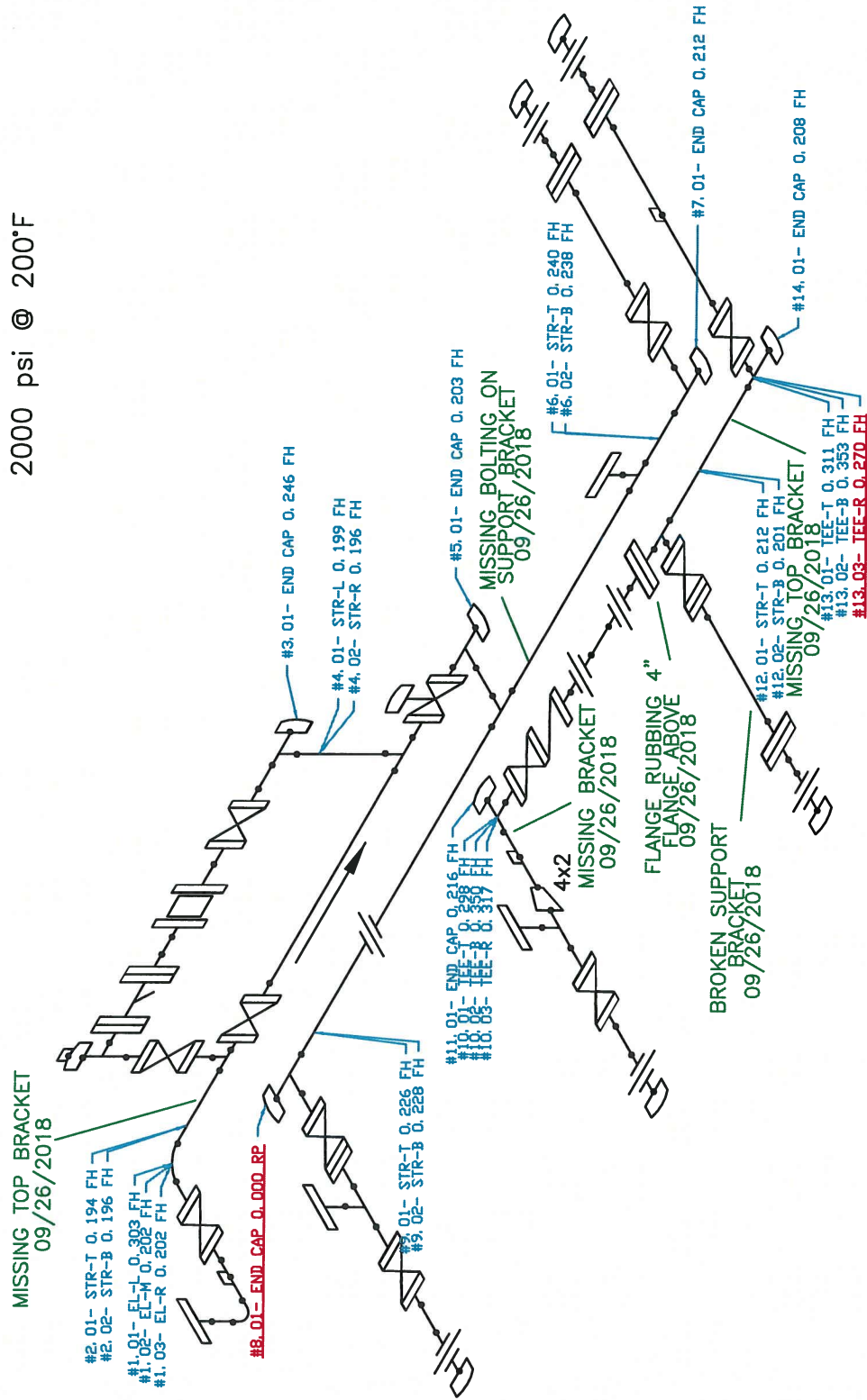
Eq/Circ ID Estimated life = 80.9 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 08/06/2099

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

EQUIP RETIREMENT DATE: 3/20/2033
NEXT INSPECTION IS DUE: 9/26/2019



HS0030-P3

DESC: WATER OUT-3 SCH 80 PIPE
DWG#: WATER-OUT-1.01-14.01

FH2E-D

PIPING 63-64°F
CAL BLK 70°F

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:10/31/2018

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

Unit: HS-0030
Eq/Circ ID: WATER OUT
Eq Type: PIPING
Class: 2
CM RBI:

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: 3 INCH SCH80 - WATER OUT PIPING

Summary: Group Name: 09/26/2019
Insp. Due Date = 03/20/2033
Pred. Ret. Date =

Group Description:
RCR = 11.3 MPY
Rem. Life (from last survey 09/26/2018) = 14.5 Yrs

0 C.A. Status: No
Total Caution TMLs = 2

TML No	Location	Ctn	First Survey Thick	First Survey Nt	First Date	Previous Survey Thick	Previous Survey Nt	Previous Date	Last Survey Thick	Last Survey 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	EL-L	N	0.206 D5	02/15/2016				N/A	0.206 RR	09/26/2018	N/A	0	0	N/A	0	0.114 P	0.1	12/05/2936	09/26/2019
1.02	EL-M	N	0.200 D5	02/15/2016				N/A	0.200 RR	09/26/2018	N/A	0	0	N/A	0	0.114 P	0.1	12/04/2876	09/26/2019
1.03	EL-R	N *	0.249	11/14/2007	0.194 RR			02/15/2016	0.201 RR	09/26/2018	0	4.4	3.6	3.6	18.1	0.114 P	4.4	06/20/2038	09/26/2019
2.01	STR-T	N *	0.243	04/14/2010	0.193 D5			02/15/2016	0.193 RR	09/26/2018	0	5.9	5.6	5.6	24.1	0.114 P	5.9	02/04/2032	09/26/2019
2.02	STR-B	N *	0.226	04/14/2010	0.198 D5			02/15/2016	0.196 FH	09/26/2018	0.8	3.5	3.0	3.0	9.0	0.114 P	3.5	02/10/2042	09/26/2019
3.01	END CAP	N	0.258 RP	03/08/2011	0.224 RR			02/15/2016	0.230 RR	09/26/2018	0	3.7	3.3	3.3	20.4	0.114 P	3.7	02/01/2050	09/26/2019
4.01	STR-L	N	0.210 RP	03/08/2011	0.194 RR			02/15/2016	0.199 FH	09/26/2018	1.1	1.5	1.1	1.1	6.8	0.114 P	1.5	05/28/2075	09/26/2019
4.02	STR-R	N	0.210 RP	03/08/2011	0.194 RR			02/15/2016	0.196 FH	09/26/2018	0	1.9	2.1	2.1	11.0	0.114 P	1.9	11/22/2061	09/26/2019
5.01	END CAP	N	0.163 RP	01/23/2015	0.163 RR			02/15/2016	0.171 RR	09/26/2018	0	0	0	0	3.1	0.114 P	0.1	12/02/2586	09/26/2019
6.01	STR-T	N *	0.262 RP	03/08/2011	0.226 D5			02/15/2016	0.226 RR	09/26/2018	0	4.8	5.6	5.6	8.9	0.114 P	4.8	01/26/2042	09/26/2019
6.02	STR-B	N	0.219 RP	03/08/2011	0.217 RR			02/15/2016	0.227 RR	09/26/2018	0	0	0	0	2.3	0.114 P	0.1	10/05/3148	09/26/2019
7.01	END CAP	N	0.170 RP	01/23/2015	0.170 D5			02/15/2016	0.170 RR	09/26/2018	0	0	0	0	21.7	0.114 P	0.1	09/30/2578	09/26/2019
8.01	END CAP	Y *	0.235	11/14/2007	0.238			01/07/2013	0.219	01/24/2014	18.2	2.6	0.9	0.9	18.2	0.114 P	18.2	11/01/2019	01/24/2015
9.01	STR-T	N	0.242	02/12/2009	0.221 D5			02/15/2016	0.221 RR	09/26/2018	0	2.2	2.6	2.6	18.8	0.114 P	2.2	05/16/2067	09/26/2019
9.02	STR-B	N	0.231	02/12/2009	0.229 RR			02/15/2016	0.228 FH	09/26/2018	0.4	0.3	0.7	0.7	7.3	0.114 P	0.4	09/29/2303	09/26/2019
10.01	TEE-T	N	0.324 RP	03/08/2011	0.303 RR			02/15/2016	0.298 FH	09/26/2018	1.9	3.4	3.1	3.1	12.6	0.114 P	3.4	10/19/2072	09/26/2019
10.02	TEE-B	N	0.273 RP	03/08/2011	0.282 RR			02/15/2016	0.319 RR	09/26/2018	0	0	0	0	0	0.114 P	0.1	10/11/4018	09/26/2019
10.03	TEE-R	N	0.346 RP	03/08/2011	0.339 RR			02/15/2016	0.317 FH	09/26/2018	8.4	3.8	3.0	3.0	8.4	0.114 P	8.4	11/18/2042	09/26/2019
11.01	END CAP	N	0.201 RP	03/08/2011	0.181 RR			02/15/2016	0.191 RR	09/26/2018	0	1.3	0.5	0.5	22.6	0.114 P	1.3	10/29/2077	09/26/2019
12.01	STR-T	N	0.212 RP	03/08/2011	0.206 RR			02/15/2016	0.207 RR	09/26/2018	0	0.7	0.3	0.3	7.9	0.114 P	0.7	05/03/2151	09/26/2019

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: WATER OUT
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: 3 INCH SCH80 - WATER OUT PIPING

Summary: Group Name: Group Description: 0 C.A. Status: No
Insp. Due Date = 09/26/2019 RCR = 11.3 MPY Total Caution TMLs = 2
Pred. Ret. Date = 03/20/2033 Rem. Life (from last survey 09/26/2018) = 14.5 yrs

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
12.02	STR-B	N	0.214 RP	03/08/2011	0.206 RR	02/15/2016	0.201 FH	09/26/2018	1.9	1.7	1.1	11.3	0.114 P	1.9	06/05/2064	09/26/2019
13.01	TEE-T	N	0.317 RP	03/08/2011	0.283 RR	02/15/2016	0.311 FH	09/26/2018	0	0.8	0.4	27.1	0.114 P	0.8	10/05/2264	09/26/2019
13.02	TEE-B	N	0.277 RP	03/08/2011	0.259 RR	02/15/2016	0.271 RR	09/26/2018	0	0.8	1.8	10.0	0.114 P	0.8	10/06/2214	09/26/2019
13.03	TEE-R	Y *	0.348 RP	03/08/2011	0.338 RR	02/15/2016	0.270 FH	09/26/2018	26.0	10.3	8.8	26.0	0.114 P	26.0	09/23/2024	09/26/2019
14.01	END CAP	N	0.212 RP	03/08/2011	0.180 RR	02/15/2016	0.191 RR	09/26/2018	0	2.8	3.1	14.7	0.114 P	2.8	03/04/2046	09/26/2019

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

Report Date: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: WATER OUT
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM RBI:

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: 3 INCH SCH80 - WATER OUT PIPING

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

Representative Corrosion Rate is the Maximum of:
(A) -- Average Corrosion Rate x 1.00 : 3.7 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 11.3 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 4.6 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 11.3 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 = 14.5 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

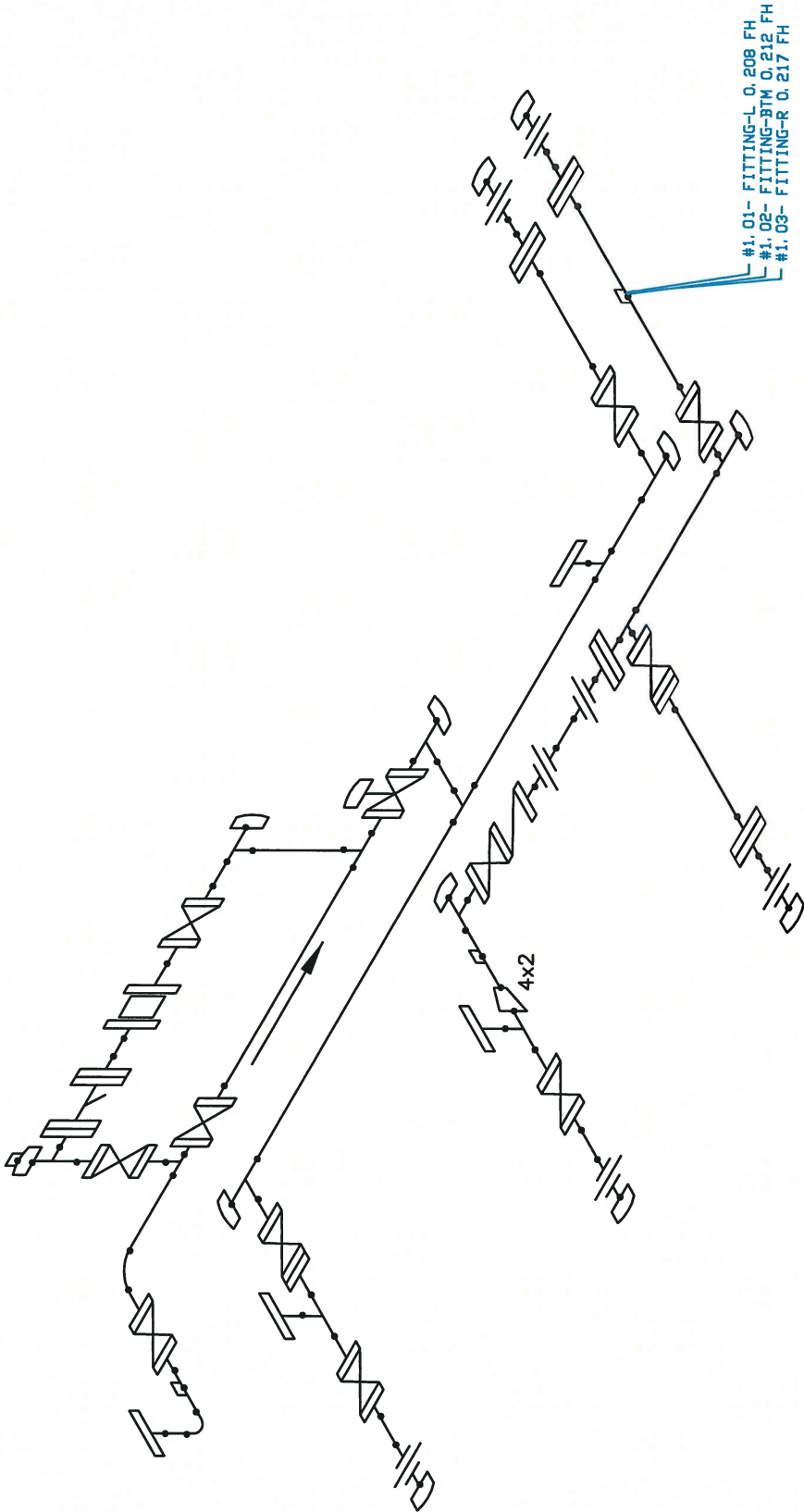
Predicted Eq/Circ ID Retirement date is 03/20/2033

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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 2 Caution TMLs in this Eq/Circ ID.

EQUIP RETIREMENT DATE: 2/14/2044
NEXT INSPECTION IS DUE: 9/26/2019

2000 psi @ 200°F



DESC: 3 SCH 80 PIPE - WATER OUT LINES
DWG#: WATER-OUT-SP-1.01-1.03

FH2E-D

PIPING 63-64°F
CAL BLK 70°F

HS0030-P3

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: WATER OUT-SP
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: 3 INCH SCH80 - WATER OUT PIPING

Summary: Group Name: Group Description:
Insp. Due Date = 09/26/2019 RCR = 6.6 MPY
Pred. Ret. Date = 02/14/2044 Rem. Life (from last survey 09/26/2018) = 25.4 Yrs
0 C.A. Status: No
Total Caution TMLs = 0

TML No	Location	Ctn TML	First Survey Thick	First Date	Previous Survey Thick	Previous Date	Last Survey Thick	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	FITTING-L	N *	0.221 RP	01/23/2015	0.204 D5	02/15/2016	0.204 RR	09/26/2018	0	4.6	3.8	16.0	0.114 P	4.6	04/06/2038	09/26/2019
1.02	FITTING-BTM	N *	0.222 RP	01/23/2015	0.208 D5	02/15/2016	0.208 RR	09/26/2018	0	3.8	3.1	13.2	0.114 P	3.8	06/05/2043	09/26/2019
1.03	FITTING-R	N *	0.221 RP	01/23/2015	0.210 D5	02/15/2016	0.210 RR	09/26/2018	0	3.0	2.4	10.4	0.114 P	3.0	09/04/2050	09/26/2019

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

Report Date: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: WATER OUT-SP
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM RBI:

Description: 3 INCH SCH80 - WATER OUT PIPING

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

Representative Corrosion Rate is the Maximum of:
(A) -- Average Corrosion Rate x 1.00
(B) -- Average Max 25.0% of TMLs, Min of 2
(C) -- Formula Corrosion Rate (Sigma = 1.28)
(D) -- Default Corrosion Rate
Representative Corrosion Rate = 6.6 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 = 25.4 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

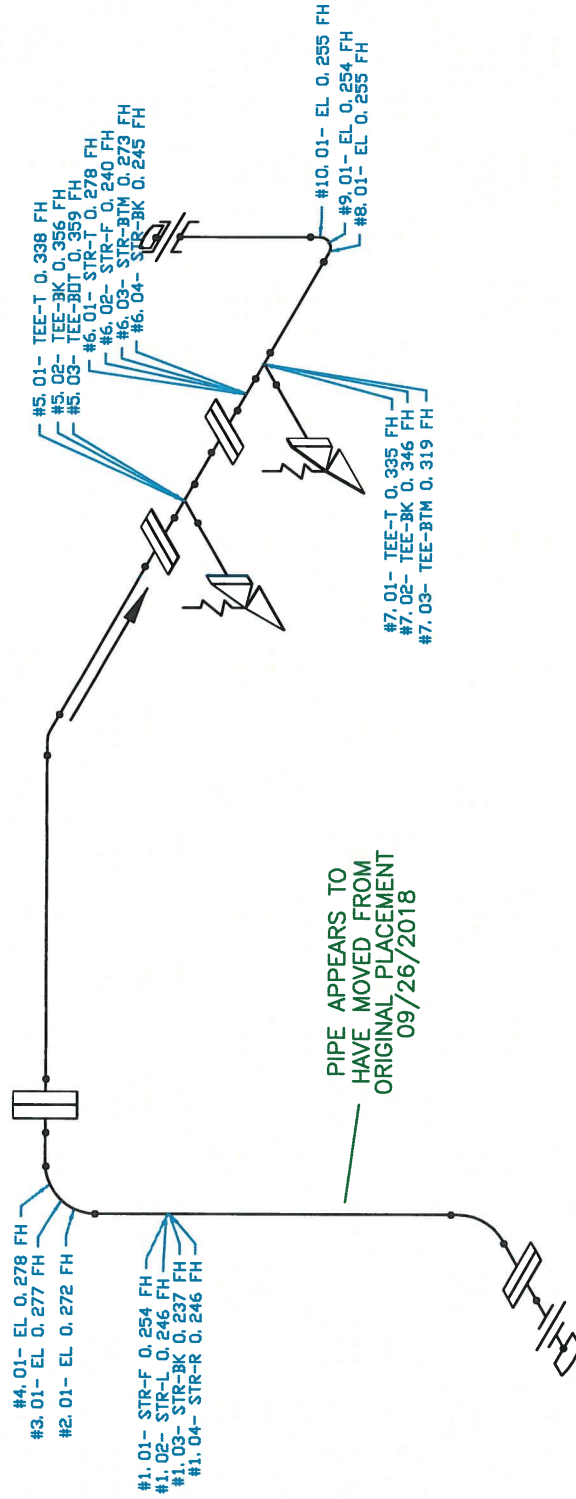
Predicted Eq/Circ ID Retirement date is 02/14/2044

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

EQUIP RETIREMENT DATE: 8/25/2169
NEXT INSPECTION IS DUE: 9/26/2019

285 psi @ 200°F



HS0030-P4

DESC: RELIEF LINE-2,4 INCH SCH 80
DWG#: RELIEF-1.01-10.01

FH2E-D

PIPING 62-63°F
CAL BLK 70°F

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:10/31/2018

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

Unit: HS-0030
Eq/Circ ID: RELIEF
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

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

Description: RELIEF LINE-4 INCH SCH40 PIPE

Summary: Group Name:

Insp. Due Date = 09/26/2019
Pred. Ret. Date = 08/25/2169

Group Description:

RCR = 2.1 MPY
Rem. Life (from last survey 09/26/2018) = 150.9 yrs

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

TML No	Location	Ctn	First Survey Thick	First Date	Previous Survey Thick	Previous Date	Last Survey Thick	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	0.252	11/14/2007	0.242 RR	02/15/2016	0.250 RR	09/26/2018	0	0.2	0.5	6.0	0.100 S	0.2	10/02/2768	09/26/2019
1.02	STR-L	N	0.246	11/14/2007	0.240 RR	02/15/2016	0.243 RR	09/26/2018	0	0.3	0.4	3.4	0.100 S	0.3	05/31/2495	09/26/2019
1.03	STR-BK	N *	0.243	11/14/2007	0.239 D5	02/15/2016	0.237 FH	09/26/2018	0.8	0.6	0.2	1.9	0.100 S	0.8	12/27/2189	09/26/2019
1.04	STR-R	N	0.247	11/14/2007	0.242 D5	02/15/2016	0.242 RR	09/26/2018	0	0.5	0.3	2.8	0.100 S	0.5	09/29/2302	09/26/2019
2.01	EL	N	0.271	11/14/2007	0.270 D5	02/15/2016	0.270 RR	09/26/2018	0	0.1	0	3.4	0.100 S	0.1	10/09/3718	09/26/2019
3.01	EL	N	0.272	11/14/2007	0.267 D5	02/15/2016	0.267 RR	09/26/2018	0	0.5	0.3	4.7	0.100 S	0.5	09/29/2352	09/26/2019
4.01	EL	N	0.272	11/14/2007	0.247 RR	02/15/2016	0.270 RR	09/26/2018	0	0.2	1.4	25.1	0.100 S	0.2	10/02/2868	09/26/2019
5.01	TEE-T	N	0.342	11/14/2007	0.338 D5	02/15/2016	0.338 FH	09/26/2018	0	0.4	0.4	3.4	0.100 S	0.4	10/01/2613	09/26/2019
5.02	TEE-BK	N	0.353	11/14/2007	0.351 D5	02/15/2016	0.351 RR	09/26/2018	0	1.1	0.8	5.6	0.100 S	1.1	12/03/2246	09/26/2019
5.03	TEE-BOT	N	0.359	11/14/2007	0.352 RR	02/15/2016	0.358 RR	09/26/2018	0	0.1	0.4	2.1	0.100 S	0.1	10/11/4018	09/26/2019
6.01	STR-T	N	0.278	11/14/2007	0.276 D5	02/15/2016	0.276 RR	09/26/2018	0	0.2	0.2	2.1	0.100 S	0.2	10/02/2898	09/26/2019
6.02	STR-F	N *	0.276	11/14/2007	0.254 RR	02/15/2016	0.240 FH	09/26/2018	5.4	3.3	3.2	13.4	0.100 S	5.4	08/29/2044	09/26/2019
6.03	STR-BTM	N *	0.260	11/14/2007	0.252 D5	02/15/2016	0.252 RR	09/26/2018	0	0.7	0	10.0	0.100 S	0.7	11/19/2235	09/26/2019
6.04	STR-BK	N *	0.251	11/14/2007	0.243 D5	02/15/2016	0.243 RR	09/26/2018	0	0.7	0.6	7.5	0.100 S	0.7	01/10/2223	09/26/2019
7.01	TEE-T	N	0.338	11/14/2007	0.337 RR	02/15/2016	0.335 FH	09/26/2018	0.8	0.3	0	1.7	0.100 S	0.8	06/29/2312	09/26/2019
7.02	TEE-BK	N *	0.360	11/14/2007	0.343 D5	02/15/2016	0.343 RR	09/26/2018	0	1.6	1.2	11.3	0.100 S	1.6	08/12/2170	09/26/2019
7.03	TEE-BTM	N *	0.333	11/14/2007	0.316 D5	02/15/2016	0.316 RR	09/26/2018	0	1.6	0.9	7.5	0.100 S	1.6	09/27/2153	09/26/2019
8.01	EL	N	0.257	11/14/2007	0.251 D5	02/15/2016	0.251 RR	09/26/2018	0	0.6	0.4	4.7	0.100 S	0.6	05/29/2270	09/26/2019
9.01	EL	N	0.254	11/14/2007	0.250 D5	02/15/2016	0.250 RR	09/26/2018	0	0.4	0.1	4.5	0.100 S	0.4	09/29/2393	09/26/2019
10.01	EL	N	0.256	11/14/2007	0.255 D5	02/15/2016	0.255 FH	09/26/2018	0	0.1	0	2.7	0.100 S	0.1	10/08/3568	09/26/2019

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

Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: RELIEF
Design Code: B31.3
Eq Type: PIPING
Class: 2
CW RBI:

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

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

Description: RELIEF LINE-4 INCH SCH40 PIPE

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

Representative Corrosion Rate is the Maximum of:
(A) -- Average Corrosion Rate x 1.00 : 0.8 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 2.1 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 1.0 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 2.1 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).

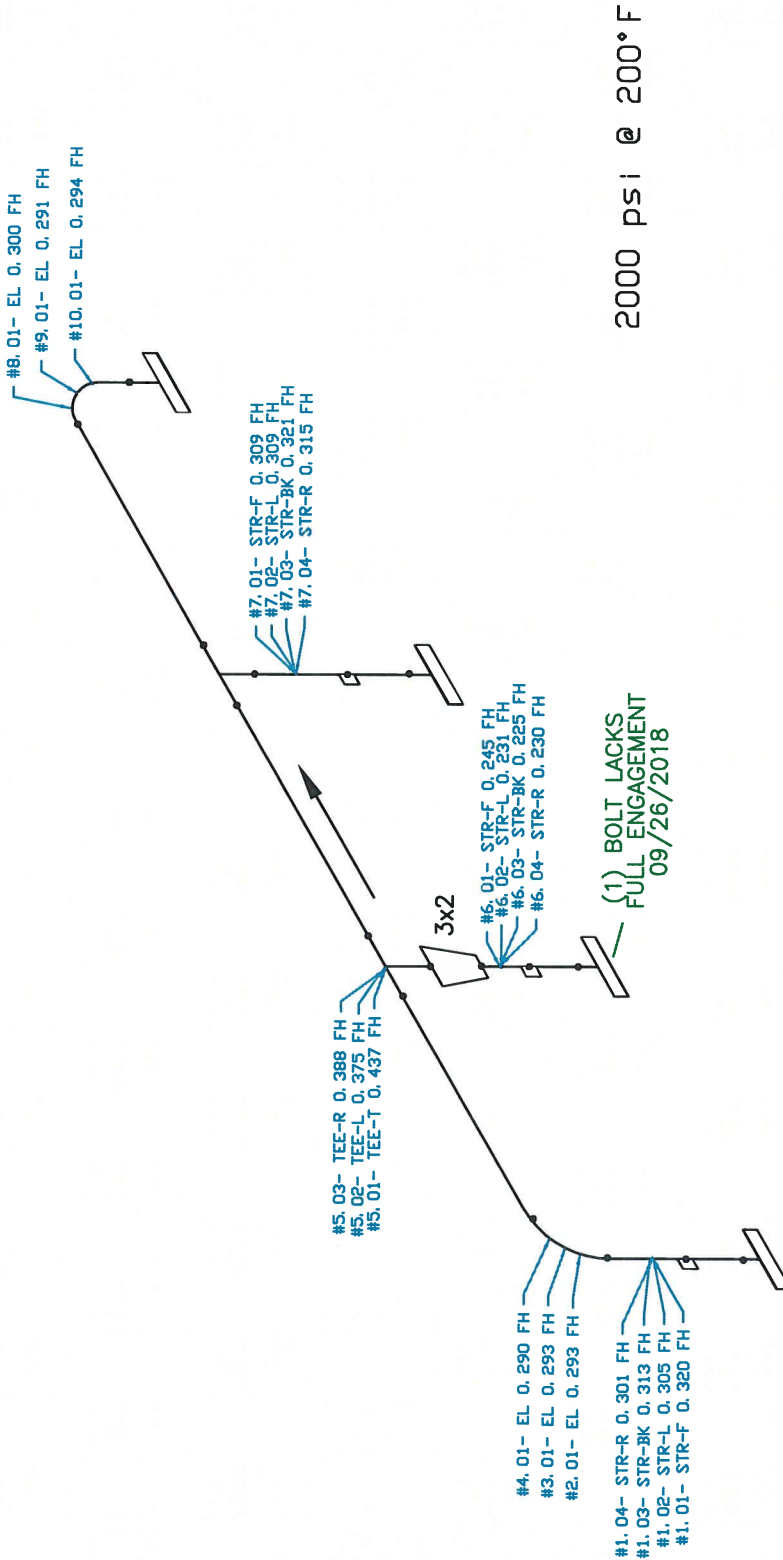
Eq/Circ ID Estimated life = 150.9 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 08/25/2169

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

EQUIP RETIREMENT DATE: 9/26/2069
NEXT INSPECTION IS DUE: 9/26/2019



HS0030-P5

DESC: HEADER PIPING-3,2 IN SCH 80
DWG#: HEADER-1.01-10.01

FH2E-D

PIPING 62°F
CAL BLK 70°F

Corrosion Monitoring Eq/Circ ID Analysis Report

Eaton Inspection Services
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Phone 307-789-3540 FAX 307-789-2822

Report Date:10/31/2018

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

Unit: HS-0030
Eq/Circ ID: HEADER
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: MANIFOLD-3 & 2 INCH SCH80 PIPE
HEADER PIPING

Summary: Group Name:
Insp. Due Date = 09/26/2019
Pred. Ret. Date = 09/26/2069

Group Description:
RCR = 2.6 MPY
Rem. Life (from last survey 09/26/2018) = 51.0 yrs

O 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
1.01	STR-F	N	0.301	11/14/2007	0.295 D5	02/15/2016	0.295 RR	09/26/2018	0	0.6	0.4	6.6	0.168 P	0.6	12/16/2229	09/26/2019
1.02	STR-L	N	0.308	11/14/2007	0.302 D5	02/15/2016	0.302 RR	09/26/2018	0	0.6	0.8	2.1	0.208 P	0.6	11/07/2174	09/26/2019
1.03	STR-BK	N *	0.321	11/14/2007	0.303 RR	02/15/2016	0.308 RR	09/26/2018	0	1.2	1.9	10.5	0.208 P	1.2	10/17/2101	09/26/2019
1.04	STR-R	N *	0.320	11/14/2007	0.313 D5	02/15/2016	0.301 FH	09/26/2018	4.6	1.7	1.2	4.6	0.208 P	4.6	11/18/2038	09/26/2019
2.01	EL	N	0.298	11/14/2007	0.293 D5	02/15/2016	0.293 FH	09/26/2018	0	0.5	0.5	4.8	0.208 P	0.5	01/27/2188	09/26/2019
3.01	EL	N	0.296	11/14/2007	0.292 D5	02/15/2016	0.292 RR	09/26/2018	0	0.4	0.4	3.0	0.208 P	0.4	11/28/2227	09/26/2019
4.01	EL	N *	0.304	11/14/2007	0.295 RR	02/15/2016	0.290 FH	09/26/2018	1.9	1.3	1.0	3.0	0.208 P	1.9	09/19/2061	09/26/2019
5.01	TEB-T	N	0.452	11/14/2007	0.432 RR	02/15/2016	0.437 FH	09/26/2018	0	1.4	1.6	6.0	0.208 P	1.4	01/27/2182	09/26/2019
5.02	TEB-L	N *	0.392	11/14/2007	0.383 D5	02/15/2016	0.375 FH	09/26/2018	3.1	1.6	1.3	4.5	0.208 P	3.1	07/01/2072	09/26/2019
5.03	TEB-R	N	0.375	11/14/2007	0.354 RR	02/15/2016	0.364 RR	09/26/2018	0	1.0	1.8	12.0	0.208 P	1.0	05/28/2174	09/26/2019
6.01	STR-F	N	0.256	11/14/2007	0.232 RR	02/15/2016	0.245 FH	09/26/2018	0	1.0	1.5	14.0	0.141 P	1.0	05/15/2122	09/26/2019
6.02	STR-L	N	0.231	11/14/2007	0.222 D5	02/15/2016	0.222 RR	09/26/2018	0	0.8	1.2	5.2	0.141 P	0.8	07/12/2119	09/26/2019
6.03	STR-BK	N *	0.237	11/14/2007	0.221 D5	02/15/2016	0.221 RR	09/26/2018	0	1.5	1.6	12.4	0.141 P	1.5	10/28/2071	09/26/2019
6.04	STR-R	N	0.241	11/14/2007	0.225 RR	02/15/2016	0.230 FH	09/26/2018	0	1.0	1.4	8.4	0.141 P	1.0	05/15/2107	09/26/2019
7.01	STR-F	N	0.311	11/14/2007	0.309 D5	02/15/2016	0.309 FH	09/26/2018	0	0.2	0.2	4.0	0.208 P	0.2	01/29/2522	09/26/2019
7.02	STR-L	N *	0.326	11/14/2007	0.314 RR	02/15/2016	0.309 FH	09/26/2018	1.9	1.6	1.3	10.0	0.208 P	1.9	09/20/2071	09/26/2019
7.03	STR-BK	N	0.318	11/14/2007	0.316 D5	02/15/2016	0.316 RR	09/26/2018	0	0.2	0.3	3.4	0.208 P	0.2	01/29/2557	09/26/2019
7.04	STR-R	N	0.315	11/14/2007	0.305 D5	02/15/2016	0.305 RR	09/26/2018	0	0.9	0.7	4.7	0.208 P	0.9	02/23/2126	09/26/2019
8.01	EL	N	0.298	11/14/2007	0.249 RR	02/15/2016	0.291 RR	09/26/2018	0	0.6	2.9	48.2	0.208 P	0.6	07/07/2156	09/26/2019
9.01	EL	N	0.294	11/14/2007	0.284 D5	02/15/2016	0.284 RR	09/26/2018	0	0.9	0.7	12.2	0.208 P	0.9	10/24/2102	09/26/2019

10.01	EL	N	0.299	11/14/2007	0.289 D5	02/15/2016	0.289 RR	09/26/2018	0	0.9	0.7	2.1	0.208	P	0.9	05/14/2108	09/26/2019
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Eaton Inspection Services
1595 So Hwy 150, Suite F, Evanston, WY 82930
Phone 307-789-3540 FAX 307-789-2822

Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: HEADER
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM RBI:

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

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: MANIFOLD-3 & 2 INCH SCH80 PIPE
HEADER PIPING

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 : 1.2 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 2.6 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 1.5 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 2.6 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).

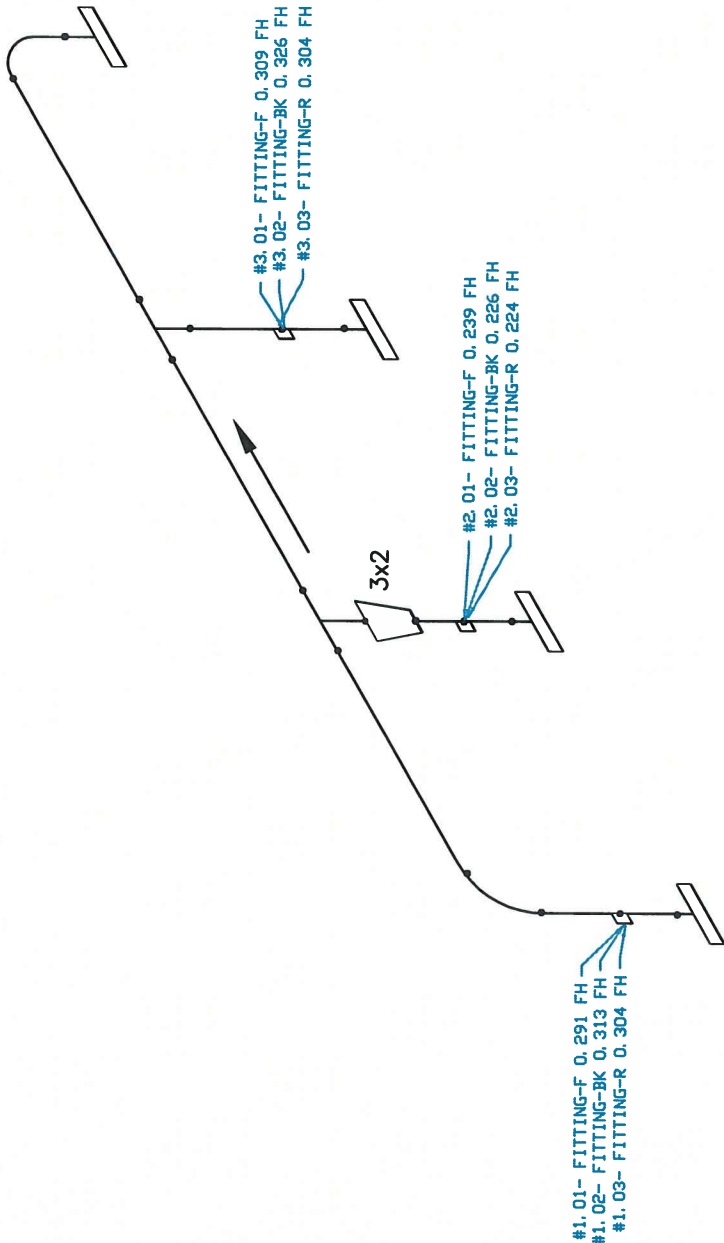
Eq/Circ ID Estimated life = 51.0 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 09/26/2069

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

EQUIP RETIREMENT DATE: 2/14/2044
NEXT INSPECTION IS DUE: 9/26/2019



2000 psi @ 200°F

HS0030-P5

DESC: 3,2 IN SCH 80 HEADER PIPING
DWG#: HEADER-SP-1.01-3.03

FH2E-D

PIPING 62°F
CAL BLK 70°F

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:10/31/2018

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

Unit: HS-0030
Eq/Circ ID: HEADER-SP
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: MANIFOLD-3 & 2 INCH SCH80 PIPE
HEADER PIPING

Summary: Group Name: Group Description: 0 C.A. Status: No
Insp. Due Date = 09/26/2019 RCR = 6.3 MPY Total Caution TMLs = 0
Pred. Ret. Date = 02/14/2044 Rem. Life (from last survey 09/26/2018) = 25.4 yrs

TML No	Location	Ctn	First Survey Thick	First Date	Previous Survey Thick	Previous Date	Last Survey Thick	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	FITTING-F	N	0.301	01/24/2014	0.292 D5	02/15/2016	0.291 FH	09/26/2018	0.4	2.1	2.4	8.5	0.168 P	2.1	03/06/2077	09/26/2019
1.02	FITTING-BK	N *	0.320	01/24/2014	0.299 D5	02/15/2016	0.299 RR	09/26/2018	0	4.5	4.6	15.1	0.168 P	4.5	10/15/2047	09/26/2019
1.03	FITTING-R	N *	0.330	01/24/2014	0.305 D5	02/15/2016	0.304 FH	09/26/2018	0.4	5.6	5.5	16.0	0.168 P	5.6	12/22/2042	09/26/2019
2.01	FITTING-F	N *	0.251	01/24/2014	0.238 D5	02/15/2016	0.238 RR	09/26/2018	0	2.8	2.6	6.6	0.141 P	2.8	03/31/2053	09/26/2019
2.02	FITTING-BK	N *	0.258	01/24/2014	0.225 D5	02/15/2016	0.225 RR	09/26/2018	0	7.1	6.5	17.1	0.141 P	7.1	07/07/2030	09/26/2019
2.03	FITTING-R	N	0.230	01/24/2014	0.222 D5	02/15/2016	0.222 RR	09/26/2018	0	1.7	1.9	7.5	0.141 P	1.7	03/02/2066	09/26/2019
3.01	FITTING-F	N *	0.322	01/24/2014	0.308 D5	02/15/2016	0.308 RR	09/26/2018	0	3.0	2.6	9.0	0.208 P	3.0	12/16/2051	09/26/2019
3.02	FITTING-BK	N	0.332	01/24/2014	0.318 D5	02/15/2016	0.318 RR	09/26/2018	0	3.0	2.3	13.0	0.208 P	3.0	04/17/2055	09/26/2019
3.03	FITTING-R	N *	0.327	01/24/2014	0.305 D5	02/15/2016	0.304 FH	09/26/2018	0.4	4.9	5.0	15.1	0.208 P	4.9	04/05/2038	09/26/2019

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Report Date: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: HEADER-SP
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM RBI:

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: MANIFOLD-3 & 2 INCH SCH80 PIPE
HEADER PIPING

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 : 3.9 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 6.3 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 5.6 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 6.3 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).

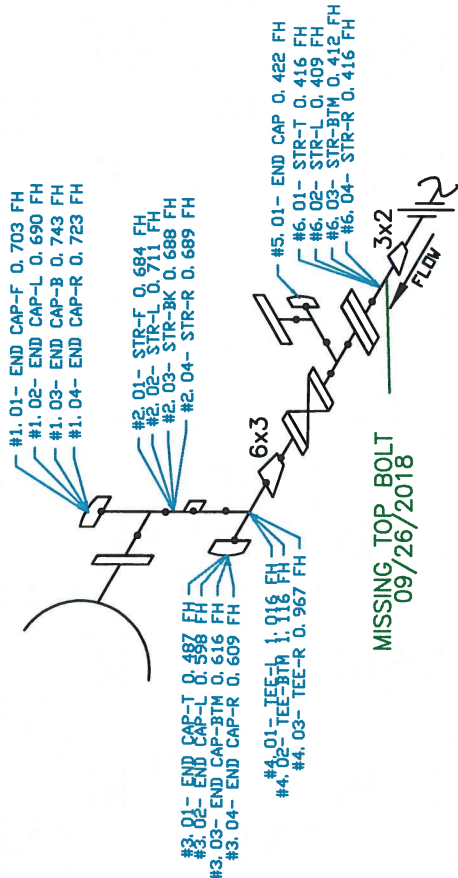
Eq/Circ ID Estimated life = 25.4 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 02/14/2044

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

EQUIP RETIREMENT DATE: 7/9/2048
NEXT INSPECTION IS DUE: 9/26/2019



2000 psi @ 200°F

HS0030-P6

DESC: GAS IN, 6,3 INCH SCH 160
DWG#: GAS-IN-1.01-6.04

PIPING 63°F
CAL BLK 70°F

FH2E-D

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: GAS IN
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: INLET MANIFOLD-6 AND 3 INCH SCH160 PIPE

Summary:	Group Name:	Group Description:
	Insp. Due Date =	RCR = 12.8 MPY
	Pred. Ret. Date =	Rem. Life (from

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

Rem. Life (from last survey 09/26/2018) = 29.8 yrs

TML No	Location	Ctn TML	First Survey Thck Nt	First Date	Previous Survey Thck Nt	Previous Date	Last Survey Thck 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	END CAP-F	N *	0.796 RP	04/14/2010	0.734 D5	02/15/2016	0.703 FH	09/26/2018	11.9	11.0	4.0	54.5	0.319 P	11.9	01/17/2051	09/26/2019
1.02	END CAP-L	N *	0.797 RP	04/14/2010	0.701 D5	02/15/2016	0.690 FH	09/26/2018	4.2	12.7	10.7	31.5	0.319 P	12.7	12/27/2047	09/26/2019
1.03	END CAP-B	N *	0.799 RP	04/14/2010	0.681 D5	02/15/2016	0.681 RR	09/26/2018	0	14.0	10.8	43.3	0.319 P	14.0	08/17/2044	09/26/2019
1.04	END CAP-R	N *	0.812 RP	04/14/2010	0.719 D5	02/15/2016	0.719 RR	09/26/2018	0	11.0	5.6	58.5	0.319 P	11.0	02/22/2055	09/26/2019
2.01	STR-F	N	0.704 RP	04/14/2010	0.693 RR	02/15/2016	0.684 FH	09/26/2018	3.4	2.4	1.7	6.2	0.319 P	3.4	03/27/2126	09/26/2019
2.02	STR-L	N	0.734 RP	04/14/2010	0.685 D5	02/15/2016	0.685 RR	09/26/2018	0	5.8	5.8	16.9	0.319 P	5.8	12/03/2081	09/26/2019
2.03	STR-BK	N	0.725 RP	04/14/2010	0.681 RR	02/15/2016	0.688 FH	09/26/2018	0	4.4	2.7	23.6	0.319 P	4.4	09/18/2102	09/26/2019
2.04	STR-R	N	0.697 RP	04/14/2010	0.676 D5	02/15/2016	0.676 RR	09/26/2018	0	2.5	2.4	28.2	0.319 P	2.5	09/25/2161	09/26/2019
3.01	END CAP-T	N *	0.594 RP	03/08/2011	0.487 D5	02/15/2016	0.487 FH	09/26/2018	0	14.2	16.6	96.0	0.319 P	14.2	08/08/2030	09/26/2019
3.02	END CAP-L	N *	0.647 RP	03/08/2011	0.602 D5	02/15/2016	0.598 FH	09/26/2018	1.5	6.5	7.4	39.5	0.319 P	6.5	09/25/2061	09/26/2019
3.03	END CAP-BTM	N	0.606 RP	03/08/2011	0.588 D5	02/15/2016	0.588 RR	09/26/2018	0	2.4	2.8	16.0	0.319 P	2.4	01/10/2131	09/26/2019
3.04	END CAP-R	N	0.653 RP	03/08/2011	0.603 D5	02/15/2016	0.603 RR	09/26/2018	0	6.6	7.5	33.9	0.319 P	6.6	11/03/2061	09/26/2019
4.01	TEE-L	N	0.972 RP	03/08/2011	0.971 RR	02/15/2016	1.016 FH	09/26/2018	0	0	0	2.3	0.319 P	0.1	10/11/4018	09/26/2019
4.02	TEE-BTM	N	1.118 RP	03/08/2011	1.136 D5	02/15/2016	1.116 FH	09/26/2018	7.7	0.3	0	11.3	0.319 P	7.7	04/23/2122	09/26/2019
4.03	TEE-R	N	1.042 RP	03/08/2011	0.963 D5	02/15/2016	0.963 RR	09/26/2018	0	10.5	11.9	75.3	0.319 P	10.5	02/12/2080	09/26/2019
5.01	END CAP	N	0.453	11/14/2007	0.401 RR	02/15/2016	0.402 RR	09/26/2018	0	4.7	6.5	54.3	0.168 P	4.7	06/19/2068	09/26/2019
6.01	STR-T	N	0.455	11/14/2007	0.413 D5	02/15/2016	0.413 RR	09/26/2018	0	3.9	4.0	7.5	0.168 P	3.9	06/27/2081	09/26/2019
6.02	STR-L	N	0.459	11/14/2007	0.415 D5	02/15/2016	0.409 FH	09/26/2018	2.3	4.6	4.1	8.1	0.168 P	4.6	01/26/2071	09/26/2019
6.03	STR-BTM	N	0.441	11/14/2007	0.404 RR	02/15/2016	0.412 FH	09/26/2018	0	2.7	3.4	9.0	0.168 P	2.7	01/03/2109	09/26/2019
6.04	STR-R	N	0.438	11/14/2007	0.408 D5	02/15/2016	0.408 RR	09/26/2018	0	2.8	3.0	6.0	0.168 P	2.8	05/10/2104	09/26/2019

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Phone 307-789-3540 FAX 307-789-2822

Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: GAS IN
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM RBI:

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

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: INLET MANIFOLD-6 AND 3 INCH SCH160 PIPE

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

Representative Corrosion Rate is the Maximum of:
(A) -- Average Corrosion Rate x 1.00 : 6.6 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 12.8 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 8.5 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 12.8 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).

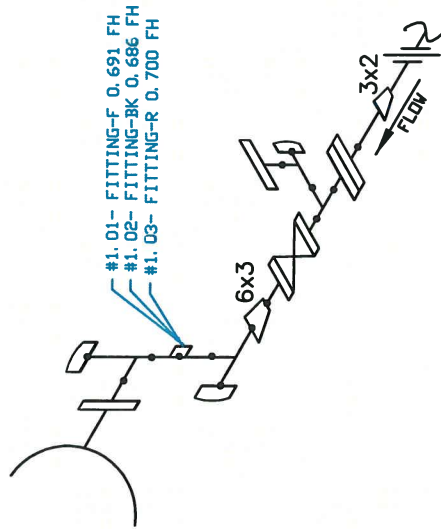
Eq/Circ ID Estimated life = 29.8 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 07/09/2048

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.

EQUIP RETIREMENT DATE: 8/22/2148
NEXT INSPECTION IS DUE: 9/26/2019



2000 psi @ 200°F

HS0030-P6

DESC: 6,3 INCH SCH 160 GAS IN
DWG#: GAS-IN-SP-1.01-1.03

FH2E-D

PIPING 63°F
CAL BLK 70°F

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: 10/31/2018

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

Unit: HS-0030
Eq/Circ ID: GAS IN-SP
Eq Type: PIPING
Class: 2
CM RBI:
Design Code: B31.3

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: INLET MANIFOLD-6 AND 3 INCH SCH160 PIPE

Summary: Group Name: Group Description: 0 C.A. Status: No
Insp. Due Date = 09/26/2019 RCR = 6.3 MPY Total Caution TMLs = 0
Pred. Ret. Date = 08/22/2148 Rem. Life (from last survey 09/26/2018) = 129.9 yrs

TML No	Location	Ctn	First Survey Thick	First Survey Nt	First Date	Previous Survey Thick	Previous Survey Nt	Previous Date	Last Survey Thick	Last Survey 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	FITTING-F	N *	0.701		01/24/2014	0.684	D5	02/15/2016	0.684	RR	09/26/2018	0	3.6	2.9	15.1	0.319	P	3.6	04/06/2120	09/26/2019
1.02	FITTING-BK	N *	0.707		01/24/2014	0.682	D5	02/15/2016	0.682	RR	09/26/2018	0	5.4	5.1	14.1	0.319	P	5.4	01/18/2086	09/26/2019
1.03	FITTING-R	N *	0.702		01/24/2014	0.689	RR	02/15/2016	0.694	RR	09/26/2018	0	1.7	0.9	13.0	0.319	P	1.7	08/14/2239	09/26/2019

Eaton Inspection Services
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Report Date: 10/31/2018

Unit: HS-0030
Eq/Circ ID: GAS IN-SP
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM RBI:

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

Flange Rating: 2025 lb/in²
Design Pressure: 2000 lb/in²
Design Temperature: 200 °F

Description: INLET MANIFOLD-6 AND 3 INCH SCH160 PIPE

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 : 3.6 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 4.5 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 6.3 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 6.3 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 = 129.9 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 08/22/2148

Recommended Eq/Circ UT/RT Inspection Date is 09/26/2019
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.