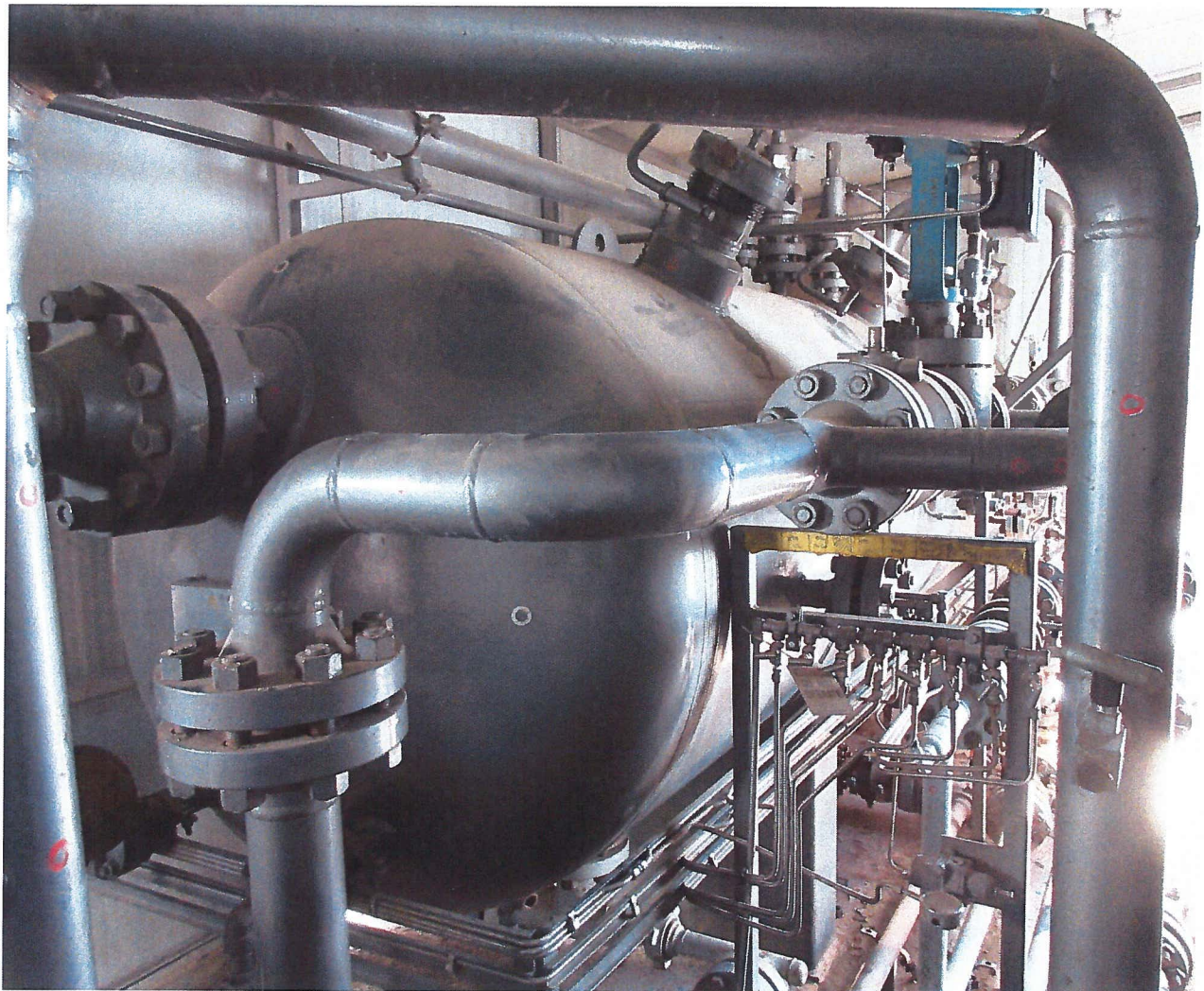




1595 So. Hwy 150, Suite F
Evanston, WY 82930

Inspections Performed for: FMC Technologies Completion – Grand Junction	
Inspection Report for: HS-0031 Separator	
Remaining Life: 20+ YRS	Date Last Inspected: 09/25/2018
Representative Corrosion Rate: 4.3 MPY	Next UT: 09/25/2019 Next VT: 09/25/2019
Manufacturer: Micoda Process Systems	Manufacturer Serial #: 1257
Year Built: 2005	National Board #: 23
Alberta Registration #: 525083	Canadian Registration #: R9975.2

HS-0031 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 : Grand Junction District
Field Name :
Equipment Number : HS-0031
Eq/Circ. ID : HS0031-SEP
Equipment Name/Service : Separator
Physical Location : On location in Parachute, CO Area
GPS Coordinates :

VESSEL DESCRIPTION AND SERVICE CONDITIONS

Type of Vessel: Horizontal Separator

Vessel Size: 50"

Operating Pressure Range (psig):

Operating Temperature Range (°F):

Does the vessel have Internal Access? Yes

Specify type of internal access, if available: Manway in 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)

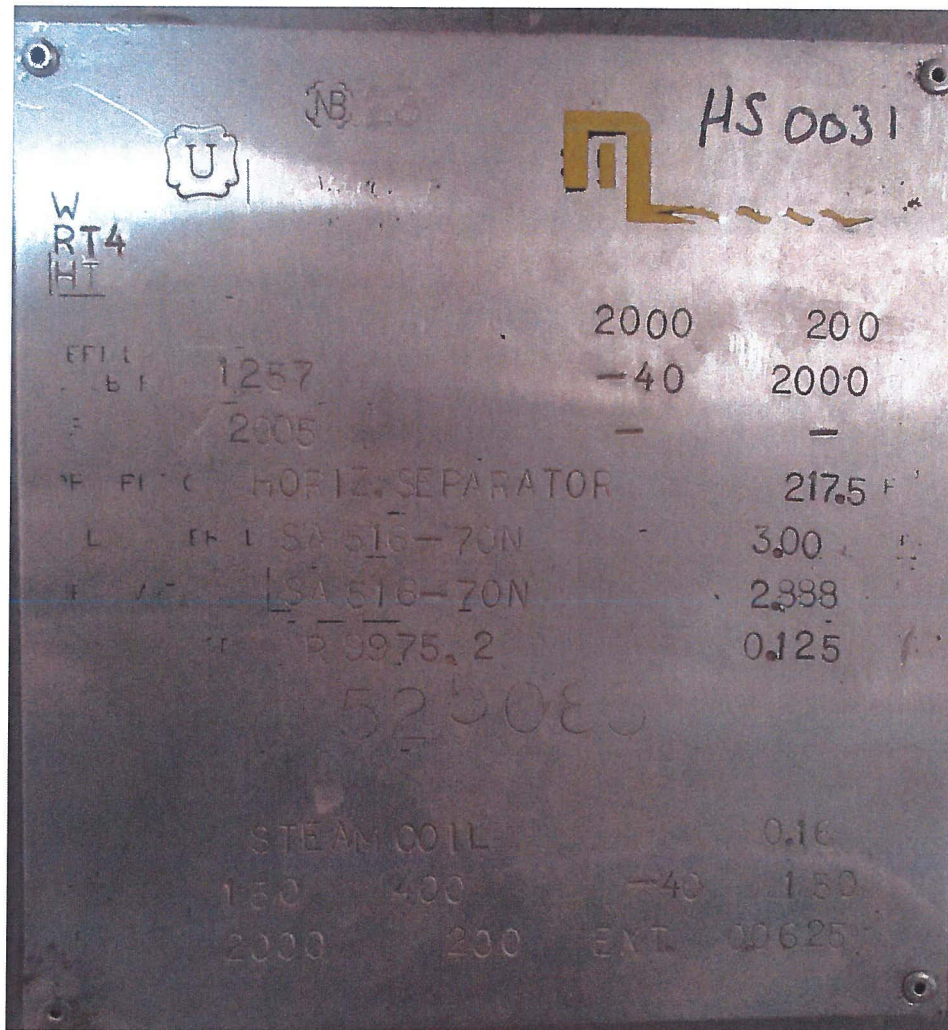
Approximate Date built or installed (check associated equipment or info at facility)

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: 02/07/2012

API 510 PRESSURE VESSEL EXTERNAL INSPECTION REPORT

Company Name: FMC Technologies Completion	
Field/Location: Grand Junction	
Equipment Number: HS-0031	Eq/Circ. ID: HS0031-SEP
Equipment Name/Service: Separator	
Physical Location: RDI Yard	
Manufacturer: Micoda Process Systems	Manufacturer Serial #: 1257
Year Built: 2005	National Board #: 23
Alberta Registration #: 525083	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. Stamping is legible. The painted wording is mostly worn off.

Internal Access?: Yes. Manway.

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

Grounding Device in Place and Secure?: No. Vessel was not in service at the time of this inspection.

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

Condition of Steel Supports, Saddles, and Bolting: The (2) vertical supports have no corrosion or distortion. The accessible support-to-shell attachment welds have no visual weld defects. (2) saddle supports are welded to skid. Welds appear full and uniform.

Condition of Paint and/or Insulation: The paint is in acceptable condition with minor localized chipping and peeling. Minimal chipping on head outside trailer. The vessel is not insulated.

Condition of Nozzles, Flanges, Repads, and Weepholes: Nozzle and flanges are in good condition. Nozzles and flanges appear to be in acceptable condition. There are no threaded connections. There are multiple flanges disconnected and/or open. Vessel is not in service.

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. All welds appear full and uniform. There is no chipping or peeling on vessel welds.

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

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

Is There a PSV on the Vessel?: Yes

If Yes, is it set at or below the MAWP?: Yes, set at 2000 & 2160 psi

Date PSV last tested (if there is a tag on the valve): 11/2015

Comments:

There are (2) PSVs. 1) bolt on inlet nozzle lacks full engagement.

Recommendations:

Tighten bolt on inlet nozzle.

Repairs Needed:

Robert W. Menke/BGW/MK
API 510 Inspector Signature

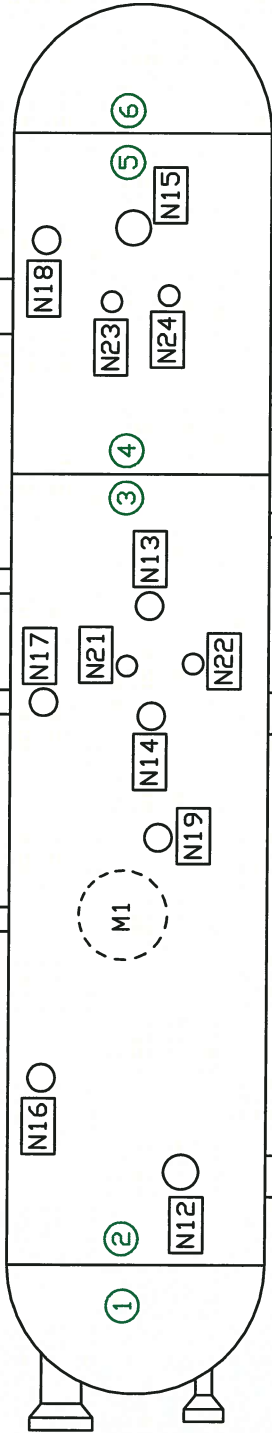
0131
API 510 Inspector Number

09/25/2018
Date

EQUIP RETIREMENT DATE: 10/30/2044
NEXT INSPECTION IS DUE: 9/25/2019

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

M1	18' MANWAY
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TC-560

NAMEPLATE INFO	
MFG	MICODDA PROCESS SYSTEMS
SERIAL NUMBER	1257
NATIONAL BOARD #	23
DATE BUILT	2005
DESIGN P & T	2000 psi @ 200°F
NOTE	CRN R9975.2 ALBERTA REG # 525083

#124.03- N-24-OIL- LG-BTM 0.348 TC	
#125.01- MW-1-T 3.032 TC	
#125.02- MW-1-LEFT 3.028 TC	
#125.03- MW-1-BT 3.036 TC	
#125.04- MW-1-RIGHT 3.034 TC	

BUSINESS FMC TECHNOLOGIES	
UNIT	COMPLETION
EQ/CIRC ID #	HS0031-SEP
EQUIP NAME	SEPARATOR
LOCATION	INSIDE SKID UNIT HS-0031
DWG #	HS0031-SEP

- #1.01- FRONT 2.964 TC
#1.02- BOTTOM 2.935 TC
#1.03- BACK 2.942 TC
#1.04- TOP 3.030 TC
#2.01- FRONT 3.042 TC
#2.02- BOTTOM 3.050 TC
#2.03- BACK 3.035 TC
#2.04- TOP 3.049 TC
#3.01- FRONT 3.057 TC
#3.02- BOTTOM 3.048 TC
#3.03- BACK 3.053 TC
#3.04- TOP 3.057 TC
#4.01- FRONT 3.042 TC
#4.02- BOTTOM 3.024 TC
#4.03- BACK 3.038 TC
#4.04- TOP 3.032 TC
#5.01- FRONT 3.009 TC
#5.04- TOP 3.032 TC
#6.01- FRONT 2.943 TC
#6.02- BOTTOM 2.946 TC
#6.03- BACK 2.941 TC
#6.04- TOP 2.942 TC
#101.01- N-1 INLET-TOP 2.454 TC
#101.02- N-1 INLET-LEFT 2.464 TC
#101.03- N-1 INLET-BTM 2.450 TC
#101.04- N-1 INLET-RIGHT 2.456 TC
#102.01- N-2 OUTLET-FRONT 2.464 TC
#102.02- N-2 OUTLET-LEFT 2.472 TC
#102.03- N-2 OUTLET-RIGHT 2.464 TC
#103.01- N-3 PSV-1-FRONT 0.352 TC
#103.03- N-3 PSV-1-BACK 0.338 TC
#104.01- N-4 PSV-2-FRONT 0.341 TC
#104.03- N-4 PSV-2-BACK 0.326 TC
#105.01- N-5STMCOIL-F-TOP 0.430 DC
#105.03- N-5STMCOIL-F-BTM 0.417 TC
#106.01- N-6STMCOIL-BK-T 0.410 TC
#106.03- N-6STMCOIL-BK-B 0.440 DC
#107.03- N-7SLDSDRAIN-F 1.785 TC
#107.04- N-7SLDSDRAIN-L 1.775 TC
#108.01- N-8 H2ODRAIN-F 1.561 TC
#108.02- N-8 H2ODRAIN-L 1.559 TC
#108.03- N-8 H2ODRAIN-BK 1.543 TC
#108.04- N-8 H2ODRAIN-RGT 1.530 DC
#110.02- N-10 H2O DUT-F 0.287 TC
#110.03- N-10 H2O DUT-BK 0.284 TC
#111.02- N-11-OILDR-F 0.348 TC
#111.03- N-11-OILDR-BK 0.326 DC
#112.01- N-12-SPARGE-TOP 0.334 TC
#112.03- N-12-SPARGE-BTM 0.348 DC
#113.01- N-13-TOP 0.344 DC
#113.03- N-13-BTM 0.339 DC
#114.01- N-14-WATER-T 1.564 TC
#114.02- N-14-WATER-L 1.568 TC
#114.03- N-14-WATER-BT 1.559 TC
#114.04- N-14-WATER-R 1.561 TC
#115.01- N-15-OIL-LC-TOP 1.578 TC
#115.02- N-15-OIL-LC-L 1.578 TC
#115.03- N-15-OIL-LC-BTM 1.577 DC
#115.04- N-15-OIL-LC-R 1.576 TC
#116.01- N-16-F 2.021 TC
#116.02- N-16-L 2.030 TC
#116.03- N-16-B 2.031 TC
#116.04- N-16-R 2.026 TC
#117.01- N-17-F 2.045 TC
#117.02- N-17-L 2.045 TC
#117.03- N-17-B 2.046 TC
#117.04- N-17-R 2.042 TC
#118.01- N-18-F 2.068 TC
#118.02- N-18-L 2.069 TC
#118.03- N-18-B 2.066 TC
#118.04- N-18-R 2.067 TC
#119.01- N-19 TI-TOP 0.348 TC
#119.03- N-19 TI-BTM 0.355 TC
#120.01- N-20 PI-FRONT 0.358 TC
#120.03- N-20 PI-FBACK 0.350 TC
#121.01- N-21-H2OLG-TOP 0.350 DC
#121.03- N-21-H2OLG-BTM 0.342 TC
#122.01- N-22-H2OLG-TOP 0.340 TC
#122.03- N-22-H2OLG-BTM 0.354 TC
#123.01- N-23-OIL- LG-TOP 0.337 TC
#123.03- N-23-OIL- LG-BTM 0.324 TC
#124.01- N-24-OIL- LG-TOP 0.323 TC

DESC: HORIZONTAL SEPARATOR

DWG#: HS0031-SEP-1.01-125.04

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-0031
Eq/Circ ID: HS0031-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: 1257

Summary: Group Name: Insp. Due Date = 09/25/2019
Pred. Ret. Date = 10/30/2044

Group Description:
RCR = 4.3 MPY
Rem. Life (from last survey 09/25/2018) = 26.1 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
1.01	FRONT	N	2.960	04/26/2007	2.960 RR	01/24/2015	2.964 TC	09/25/2018	0	0	0	3.2	2.591 P	0.1	10/10/4018	09/25/2019
1.02	BOTTOM	N	2.931	04/26/2007	2.930 RR	01/24/2015	2.935 TC	09/25/2018	0	0	0	9.6	2.591 P	0.1	10/10/4018	09/25/2019
1.03	BACK	N	2.939	04/26/2007	2.937 RR	01/24/2015	2.942 TC	09/25/2018	0	0	0	5.3	2.591 P	0.1	10/10/4018	09/25/2019
1.04	TOP	N	3.024	04/26/2007	3.026 TC	01/24/2015	3.026 RR	09/25/2018	0	0	0	2.1	2.591 P	0.1	10/10/4018	09/25/2019
2.01	FRONT	N	3.037	04/26/2007	3.034 RR	01/24/2015	3.042 TC	09/25/2018	0	0	0	6.4	2.732 P	0.1	10/10/4018	09/25/2019
2.02	BOTTOM	N	3.050	04/26/2007	3.045 RR	01/24/2015	3.048 RR	09/25/2018	0	0.2	0.2	12.8	2.732 P	0.2	10/07/3598	09/25/2019
2.03	BACK	N	3.041	04/26/2007	3.037 RR	01/24/2015	3.035 TC	09/25/2018	0.5	0.5	0.7	5.3	2.732 P	0.5	09/29/2624	09/25/2019
2.04	TOP	N	3.047	04/26/2007	3.046 RR	01/24/2015	3.049 TC	09/25/2018	0	0	0	7.5	2.732 P	0.1	10/10/4018	09/25/2019
3.01	FRONT	N	3.052	04/26/2007	3.053 RR	01/24/2015	3.057 TC	09/25/2018	0	0	0	1.3	2.732 P	0.1	10/10/4018	09/25/2019
3.02	BOTTOM	N	3.042	04/26/2007	3.046 RR	01/24/2015	3.048 TC	09/25/2018	0	0	0	5.3	2.732 P	0.1	10/10/4018	09/25/2019
3.03	BACK	N	3.048	04/26/2007	3.046 TC	01/24/2015	3.046 RR	09/25/2018	0	0.2	0.3	9.6	2.732 P	0.2	10/06/3588	09/25/2019
3.04	TOP	N	3.062	04/26/2007	3.052 RR	01/24/2015	3.057 TC	09/25/2018	0	0.4	0.6	11.7	2.732 P	0.4	04/02/2831	09/25/2019
4.01	FRONT	N	3.038	04/26/2007	3.032 TC	01/24/2015	3.032 RR	09/25/2018	0	0.5	0.7	3.2	2.732 P	0.5	09/30/2618	09/25/2019
4.02	BOTTOM	N	3.020	04/26/2007	3.041 TC	01/24/2015	3.024 TC	09/25/2018	4.6	0	0	10.4	2.732 P	4.6	03/18/2082	09/25/2019
4.03	BACK	N	3.033	04/26/2007	3.046 TC	01/24/2015	3.038 TC	09/25/2018	2.2	0	0	4.7	2.732 P	2.2	10/29/2157	09/25/2019
4.04	TOP	N	3.035	04/26/2007	3.028 RR	01/24/2015	3.032 TC	09/25/2018	0	0.3	0.4	3.2	2.732 P	0.3	10/03/3018	09/25/2019
5.01	FRONT	N	3.009	04/26/2007	3.013 RR	01/24/2015	3.009 TC	09/25/2018	1.1	0	0	1.9	2.732 P	1.1	07/23/2270	09/25/2019
5.04	TOP	N	3.038	04/26/2007	3.030 RR	01/24/2015	3.032 TC	09/25/2018	0	0.5	0.3	4.9	2.732 P	0.5	09/30/2618	09/25/2019
6.01	FRONT	N	2.943	04/26/2007	2.938 RR	01/24/2015	2.943 TC	09/25/2018	0	0	0.2	6.4	2.591 P	0.1	10/10/4018	09/25/2019
6.02	BOTTOM	N	2.946	04/26/2007	2.943 RR	01/24/2015	2.946 TC	09/25/2018	0	0	0	2.3	2.591 P	0.1	10/10/4018	09/25/2019

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-0031
Eq/Circ ID: HS0031-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: 1257

Summary: Group Name: Group Description:

Insp. Due Date = 09/25/2019

RCR = 4.3 MPY

Pred. Ret. Date = 10/30/2044

Rem. Life (from last survey 09/25/2018) = 26.1 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	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	2.940	04/26/2007	2.947 RR	01/24/2015	2.941 TC	09/25/2018	1.6	0	0	1.9	2.591 P	1.6	06/27/2237	09/25/2019
6.04	TOP	N	2.941	04/26/2007	2.944 RR	01/24/2015	2.942 TC	09/25/2018	0.5	0	0	1.5	2.591 P	0.5	10/01/2720	09/25/2019
101.01	N-1 INLET-TOP	N	2.463	04/26/2007	2.452 TC	01/24/2015	2.452 RR	09/25/2018	0	1.0	0.9	6.0	2.036 U	1.0	09/28/2434	09/25/2019
101.02	N-1 INLET-LEFT	N	2.473	04/26/2007	2.460 TC	01/24/2015	2.460 RR	09/25/2018	0	1.1	1.4	9.6	2.036 U	1.1	03/12/2404	09/25/2019
101.03	N-1 INLET-BTM	N	2.476	04/26/2007	2.459 RR	01/24/2015	2.450 TC	09/25/2018	2.5	2.3	2.3	5.3	2.036 U	2.5	05/02/2184	09/25/2019
101.04	N-1 INLET-RIGHT	N	2.464	04/26/2007	2.450 TC	01/24/2015	2.450 RR	09/25/2018	0	1.2	1.6	3.8	2.036 U	1.2	09/28/2363	09/25/2019
102.01	N-2 OUTLET-FRONT	N	2.465	04/26/2007	2.456 TC	01/24/2015	2.456 RR	09/25/2018	0	0.8	0.8	7.5	2.036 U	0.8	09/29/2543	09/25/2019
102.02	N-2 OUTLET-LEFT	N	2.476	04/26/2007	2.469 RR	01/24/2015	2.472 TC	09/25/2018	0	0.4	0.4	7.5	2.036 U	0.4	10/03/3108	09/25/2019
102.03	N-2 OUTLET-BACK	N	2.480	04/26/2007	2.471 RR	01/24/2015	2.471 TC	09/25/2018	0	0.8	0.7	6.4	2.036 U	0.8	06/30/2562	09/25/2019
102.04	N-2 OUTLET-RIGHT	N	2.466	04/26/2007	2.458 RR	01/24/2015	2.459 RR	09/25/2018	0	0.6	0.6	4.3	2.036 U	0.6	10/01/2723	09/25/2019
103.01	N-3 PSV-1-FRONT	N	0.370	04/26/2007	0.348 TC	01/24/2015	0.348 RR	09/25/2018	0	1.9	1.1	6.7	0.176 U	1.9	04/06/2109	09/25/2019
103.03	N-3 PSV-1-BACK	N	0.363	04/26/2007	0.324 TC	01/24/2015	0.324 RR	09/25/2018	0	3.4	3.2	7.9	0.176 U	3.4	04/06/2062	09/25/2019
104.01	N-4 PSV-2-FRONT	N	0.362	04/26/2007	0.352 RR	01/24/2015	0.341 TC	09/25/2018	3.0	1.8	0	8.5	0.176 U	3.0	09/25/2073	09/25/2019
104.03	N-4 PSV-2-BACK	N	0.362	04/26/2007	0.332 TC	01/24/2015	0.326 TC	09/25/2018	1.6	3.2	1.8	8.6	0.176 U	3.2	08/10/2065	09/25/2019
105.01	N-5STWCOIL-F-TOP	N	0.464	04/26/2007	0.412 TC	01/24/2015	0.412 RR	09/25/2018	0	4.6	4.1	18.2	0.176 U	4.6	01/14/2070	09/25/2019
105.03	N-5STWCOIL-F-BTM	N	0.430	04/26/2007	0.416 TC	01/24/2015	0.416 RR	09/25/2018	0	1.2	0.9	3.2	0.176 U	1.2	09/27/2218	09/25/2019
106.01	N-6STWCOIL-BK-T	N	0.450	04/26/2007	0.413 TC	01/24/2015	0.410 TC	09/25/2018	0.8	3.5	2.7	8.5	0.176 U	3.5	08/04/2085	09/25/2019
106.03	N-6STWCOIL-BK-B	N	0.445	04/26/2007	0.427 TC	01/24/2015	0.427 RR	09/25/2018	0	1.6	1.2	7.0	0.176 U	1.6	08/12/2175	09/25/2019
107.03	N-7SLDSDRAIN-F	N	1.810 NM	09/07/2005		N/A	1.785 TC	09/25/2018	N/A	1.9	N/A	2.9	1.459 U	1.9	04/25/2190	09/25/2019
107.04	N-7SLDSDRAIN-L	N	1.790	04/26/2007	1.775 TC	01/24/2015	1.775 TC	09/25/2018	0	1.3	1.7	12.8	1.459 U	1.3	10/25/2261	09/25/2019
108.01	N-8 H2ODRAIN-F	N	1.580 NM	09/07/2005		N/A	1.561 TC	09/25/2018	N/A	1.5	N/A	1.6	1.258 U	1.5	09/26/2220	09/25/2019

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-0031
Eq/Circ ID: HS0031-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: 1257

Summary: Group Name: Group Description:

Insp. Due Date = 09/25/2019

RCR = 4.3 MPY

Pred. Ret. Date = 10/30/2044

Rem. Life (from last survey 09/25/2018) = 26.1 Yrs

O.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
108.02	N-8 H2ODRAIN-L	N	1.580 NM	09/07/2005		N/A	1.559 TC	09/25/2018	N/A	1.6	N/A	1.6	1.258 U	1.6	11/12/2206	09/25/2019
108.03	N-8 H2ODRAIN-BK	N	1.546	04/26/2007	1.530 RR	01/24/2015	1.540 RR	09/25/2018	0	0.5	1.3	20.3	1.258 U	0.5	09/29/2582	09/25/2019
108.04	N-8 H2ODRAIN-RGT	N	1.545	04/26/2007	1.528 RR	01/24/2015	1.530 TC	09/25/2018	0	1.3	1.8	15.0	1.258 U	1.3	12/21/2227	09/25/2019
110.02	N-10 H2O OUT-F	N *	0.344 NM	09/07/2005		N/A	0.287 TC	09/25/2018	N/A	4.4	N/A	5.3	0.176 U	4.4	12/17/2043	09/25/2019
110.03	N-10 H2O OUT-BK	N *	0.327	04/26/2007	0.287 TC	01/24/2015	0.284 TC	09/25/2018	0.8	3.8	4.3	11.7	0.176 U	3.8	02/26/2047	09/25/2019
111.02	N-11-OILDR-F	N	0.344 NM	09/07/2005		N/A	0.348 TC	09/25/2018	N/A	0	N/A	1.0	0.176 U	0.1	10/08/3738	09/25/2019
111.03	N-11-OILDR-BK	N	0.328	04/26/2007	0.290 RR	01/24/2015	0.304 RR	09/25/2018	0	2.1	3.4	34.2	0.176 U	2.1	09/08/2079	09/25/2019
112.01	N-12-SPARGE-TOP	N *	0.391	04/26/2007	0.358 TC	01/24/2015	0.334 TC	09/25/2018	6.5	5.0	2.0	22.8	0.176 U	6.5	01/15/2043	09/25/2019
112.03	N-12-SPARGE-BTM	N	0.364	04/26/2007	0.339 RR	01/24/2015	0.346 RR	09/25/2018	0	1.6	1.2	13.3	0.176 U	1.6	12/26/2124	09/25/2019
113.01	N-13-TOP	N *	0.386	04/26/2007	0.329 TC	01/24/2015	0.329 RR	09/25/2018	0	5.0	3.8	10.0	0.176 U	5.0	05/02/2049	09/25/2019
113.03	N-13-BTM	N	0.350	04/26/2007	0.314 RR	01/24/2015	0.316 RR	09/25/2018	0	3.0	2.6	7.5	0.176 U	3.0	05/26/2065	09/25/2019
114.01	N-14-WATER-T	N	1.564	04/26/2007	1.553 RR	01/24/2015	1.554 RR	09/25/2018	0	0.9	1.2	13.9	1.280 U	0.9	03/09/2323	09/25/2019
114.02	N-14-WATER-L	N	1.565	04/26/2007	1.553 RR	01/24/2015	1.558 RR	09/25/2018	0	0.6	1.0	27.4	1.280 U	0.6	01/28/2482	09/25/2019
114.03	N-14-WATER-BT	N	1.580 NM	09/07/2005		N/A	1.559 TC	09/25/2018	N/A	1.6	N/A	2.9	1.280 U	1.6	02/09/2193	09/25/2019
114.04	N-14-WATER-R	N	1.556	04/26/2007	1.554 RR	01/24/2015	1.557 RR	09/25/2018	0	0	0	2.1	1.280 U	0.1	10/10/4018	09/25/2019
115.01	N-15-OIL-LC-TOP	N	1.569	04/26/2007	1.571 TC	01/24/2015	1.571 RR	09/25/2018	0	0	0	4.0	1.280 U	0.1	10/10/4018	09/25/2019
115.02	N-15-OIL-LC-L	N	1.573	04/26/2007	1.576 RR	01/24/2015	1.578 TC	09/25/2018	0	0	0	0.9	1.280 U	0.1	10/10/4018	09/25/2019
115.03	N-15-OIL-LC-BTM	N	1.572	04/26/2007	1.513 TC	01/24/2015	1.513 RR	09/25/2018	0	5.2	6.5	71.8	1.280 U	5.2	07/17/2063	09/25/2019
115.04	N-15-OIL-LC-R	N	1.576	04/26/2007	1.565 TC	01/24/2015	1.565 RR	09/25/2018	0	1.0	0.9	8.0	1.280 U	1.0	09/28/2303	09/25/2019
116.01	N-16-F	N	2.028	04/26/2007	2.026 RR	01/24/2015	2.021 TC	09/25/2018	1.4	0.6	0.6	5.3	1.652 U	1.4	04/23/2282	09/25/2019

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-0031

Eq/Circ ID: HS0031-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: 1257

Summary: Group Name:

Insp. Due Date = 09/25/2019

Pred. Ret. Date = 10/30/2044

Group Description:

RCR = 4.3 MPY

Rem. Life (from last survey 09/25/2018) = 26.1 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 Survey Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date	
116.02	N-16-L	N	2.028		04/26/2007	2.021	RR	01/24/2015	2.025	RR	09/25/2018	0	0.3	0.5	13.9	1.652	U	0.3	02/03/3262	09/25/2019
116.03	N-16-B	N	2.034		04/26/2007	2.067	TC	01/24/2015	2.031	TC	09/25/2018	9.8	0.3	0	30.4	1.652	U	9.8	05/28/2057	09/25/2019
116.04	N-16-R	N	2.033		04/26/2007	2.019	RR	01/24/2015	2.026	TC	09/25/2018	0	0.6	1.0	11.7	1.652	U	0.6	01/29/2642	09/25/2019
117.01	N-17-F	N	2.047		04/26/2007	2.042	RR	01/24/2015	2.044	RR	09/25/2018	0	0.3	0.3	2.1	1.652	U	0.3	06/05/3325	09/25/2019
117.02	N-17-L	N	2.047		04/26/2007	2.040	TC	01/24/2015	2.040	RR	09/25/2018	0	0.6	0.5	4.3	1.652	U	0.6	05/31/2665	09/25/2019
117.03	N-17-B	N	2.046		04/26/2007	2.048	TC	01/24/2015	2.046	TC	09/25/2018	0.5	0	0	0.6	1.652	U	0.5	10/01/2806	09/25/2019
117.04	N-17-R	N	2.049		04/26/2007	2.042	RR	01/24/2015	2.042	TC	09/25/2018	0	0.6	0.5	4.3	1.652	U	0.6	09/29/2668	09/25/2019
118.01	N-18-F	N	2.070		04/26/2007	2.066	RR	01/24/2015	2.067	RR	09/25/2018	0	0.3	0.2	4.3	1.652	U	0.3	02/05/3402	09/25/2019
118.02	N-18-L	N	2.072		04/26/2007	2.065	RR	01/24/2015	2.068	RR	09/25/2018	0	0.4	0.4	2.1	1.652	U	0.4	10/03/3058	09/25/2019
118.03	N-18-B	N	2.070		04/26/2007	2.065	RR	01/24/2015	2.066	TC	09/25/2018	0	0.4	0.3	4.3	1.652	U	0.4	10/03/3053	09/25/2019
118.04	N-18-R	N	2.073		04/26/2007	2.063	RR	01/24/2015	2.067	TC	09/25/2018	0	0.5	0.6	7.5	1.652	U	0.5	10/01/2848	09/25/2019
119.01	N-19 TI-TOP	N *	0.400		04/26/2007	0.339	TC	01/24/2015	0.339	RR	09/25/2018	0	5.3	3.2	12.4	0.188	U	5.3	03/23/2047	09/25/2019
119.03	N-19 TI-BTM	N	0.377		04/26/2007	0.347	TC	01/24/2015	0.347	RR	09/25/2018	0	2.6	2.0	5.9	0.188	U	2.6	11/20/2079	09/25/2019
120.01	N-20 PI-FRONT	N	0.382		04/26/2007	0.355	TC	01/24/2015	0.355	RR	09/25/2018	0	2.4	1.6	8.8	0.188	U	2.4	04/25/2088	09/25/2019
120.03	N-20 PI-FBACK	N	0.373		04/26/2007	0.338	TC	01/24/2015	0.338	RR	09/25/2018	0	3.1	2.8	9.0	0.188	U	3.1	02/13/2067	09/25/2019
121.01	N-21-H2OLG-TOP	N *	0.389		04/26/2007	0.315	TC	01/24/2015	0.315	RR	09/25/2018	0	6.5	6.3	26.7	0.188	U	6.5	04/09/2038	09/25/2019
121.03	N-21-H2OLG-BTM	N	0.364		04/26/2007	0.340	RR	01/24/2015	0.342	TC	09/25/2018	0	1.9	1.1	6.5	0.188	U	1.9	10/14/2099	09/25/2019
122.01	N-22-H2OLG-TOP	N	0.386		04/26/2007	0.337	RR	01/24/2015	0.340	TC	09/25/2018	0	4.0	2.5	10.4	0.188	U	4.0	09/25/2056	09/25/2019
122.03	N-22-H2OLG-BTM	N	0.385		04/26/2007	0.354	RR	01/24/2015	0.354	TC	09/25/2018	0	2.7	1.5	7.1	0.188	U	2.7	03/19/2080	09/25/2019
123.01	N-23-OIL- LG-TOP	N	0.379		04/26/2007	0.337	TC	01/24/2015	0.337	TC	09/25/2018	0	3.7	2.5	7.7	0.188	U	3.7	01/02/2059	09/25/2019
123.03	N-23-OIL- LG-BTM	N	0.362		04/26/2007	0.299	RR	01/24/2015	0.324	TC	09/25/2018	0	3.3	4.4	44.9	0.188	U	3.3	12/12/2059	09/25/2019

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-0031
Eq/Circ ID: HS0031-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: 1257

Summary: Group Name:
Insp. Due Date = 09/25/2019
Pred. Ret. Date = 10/30/2044

Group Description:
RCR = 4.3 MPY
Rem. Life (from last survey 09/25/2018) = 26.1 yrs

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

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
124.01	N-24-OIL- LG-TOP	N	0.363		04/26/2007	0.324 TC	0.324 TC	01/24/2015	0.323 TC	09/25/2018	0.3	3.5	2.2	9.0	0.188 U	3.5	04/21/2057	09/25/2019
124.03	N-24-OIL- LG-BTM	N	0.372		04/26/2007	0.358 TC	0.348 TC	01/24/2015	0.348 TC	09/25/2018	2.7	2.1	0.9	8.5	0.188 U	2.7	12/28/2077	09/25/2019
125.01	MW-1-T	N	3.030 NM		09/07/2005			N/A	3.032 TC	09/25/2018	N/A	0	N/A	0	2.526 U	0.1	10/10/4018	09/25/2019
125.02	MW-1-LEFT	N	3.033		04/26/2007	3.020 RR	3.028 TC	01/24/2015	3.028 TC	09/25/2018	0	0.4	1.0	16.0	2.526 U	0.4	10/04/3273	09/25/2019
125.03	MW-1-BT	N	3.030 NM		09/07/2005			N/A	3.036 TC	09/25/2018	N/A	0	N/A	0	2.526 U	0.1	10/10/4018	09/25/2019
125.04	MW-1-RIGHT	N	3.032		04/26/2007	3.020 RR	3.030 RR	01/24/2015	3.030 RR	09/25/2018	0	0.2	0.6	13.9	2.526 U	0.2	10/10/4018	09/25/2019

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-0031
Eq/Circ ID: HS0031-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: 1257

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 : 1.7 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 4.3 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 1.9 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 4.3 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 = 26.1 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 10/30/2044

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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-0031	Eq/Circ. ID: HS-0031
Equipment Name/Service: High Stage Separator	
Physical Location: RDI Yard	
Manufacturer: Micoda Process Systems	Manufacturer Serial Number: 1257
Year Built: 2005	National Board Number: 23
Alberta Registration #: 525083	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.

Manway entrance and gasket seating area: Acceptable condition. Minor chipped and flaking coating with light surface corrosion present.

Shell (note pitting, corrosion, laminations, blisters, etc. - size and location). Minor chipping and peeling with light surface corrosion. There is minor pitting along bottom half of the shell. Nothing measured deeper than .100".

Heads (note pitting, corrosion, laminations, blisters, etc. - size and location): There is minor chipped, flaking and peeling coating with light surface corrosion present. Minor pitting along bottom of shell, but nothing measureable.

Internal Circumferential and Long seam Welds: (include type and condition welds): Long seam and circumferential welds appear in acceptable condition. No visible defects.

Internal Nozzle Welds: (include type and condition welds): Majority of nozzle welds appear to be acceptable with no defects. Moderate corrosion and pitting on 2" nozzle between weir plates.

Condition of Internal Attachments and Welds: Attachment welds are visually acceptable with light surface corrosion where coating is chipped.

API 510 PRESSURE VESSEL INTERNAL INSPECTION

Comments:

Chipped coating and moderate surface corrosion on steam lines.

Recommendations:

Recommend sand blasting internal vessel and re-coat.

Repairs Needed:

Make weld repairs to 2" nozzle at next available date (sits between weir plates).

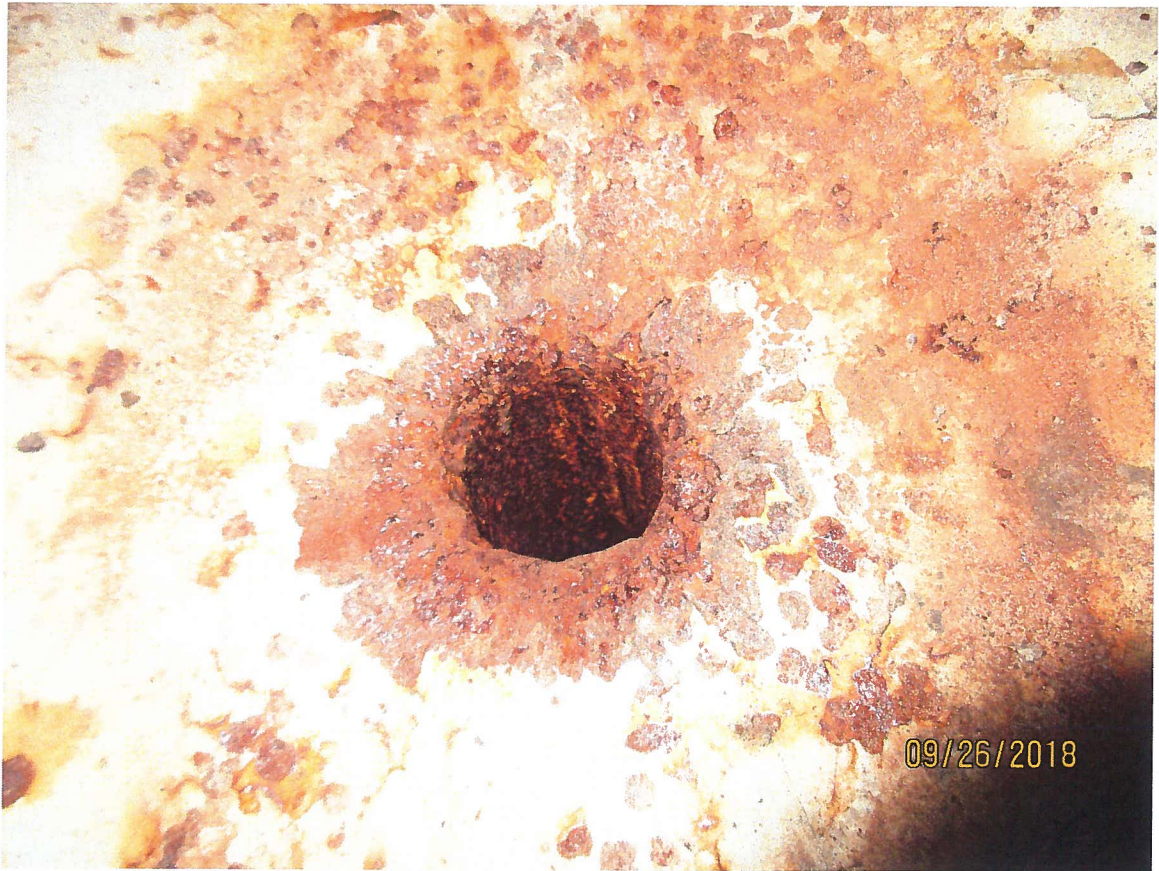
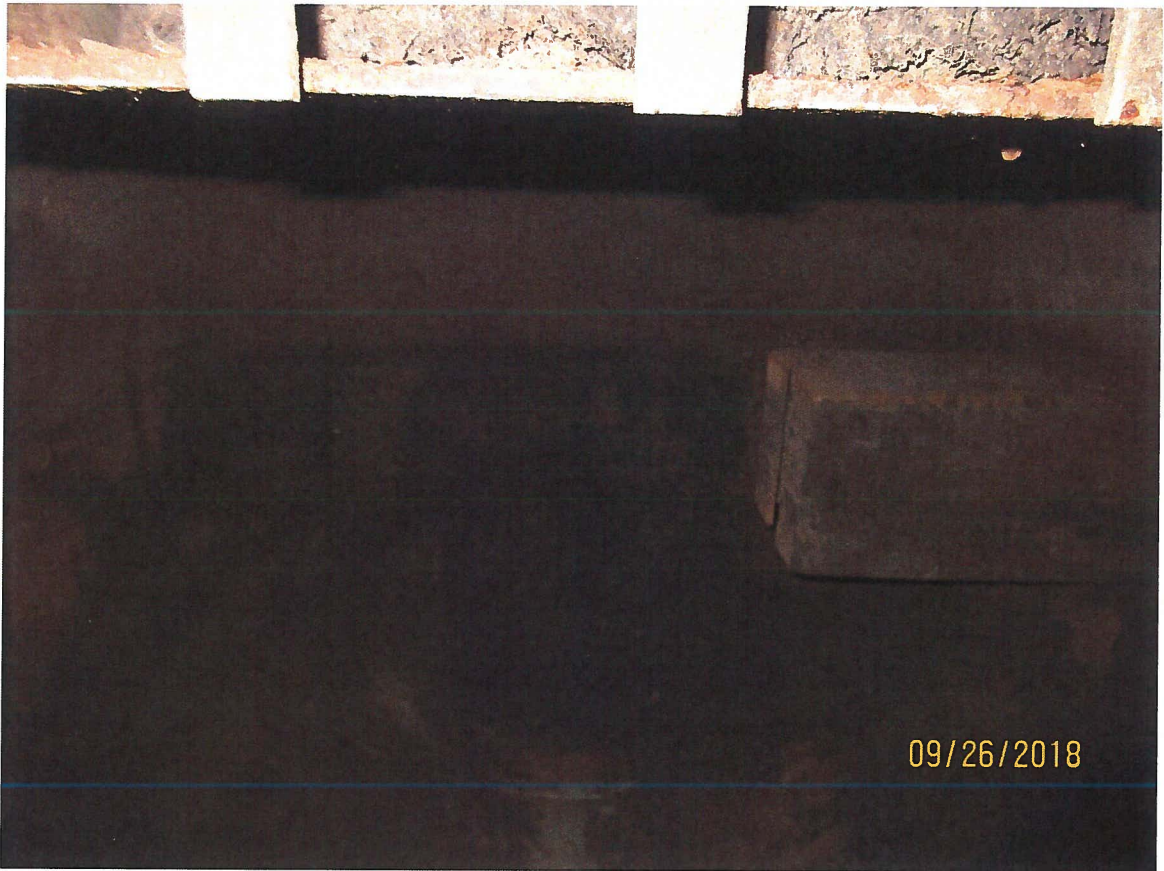
Mike York /BGW
API 510 Inspector Signature

66475
API 510 Inspector Number

09/26/2018
Date









(A) 525083

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 1257 R 9975.2 HV 44 Rev 4 23 2005
(Horiz., vert., or sphere) (Tank, separator, jkt. vessel, heat ex., 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-120(d)

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

6. Shell (a) No. of course(s): 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

	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)	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.

AWP 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., ~~####~~, ~~#####~~ 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

20-4 SS																	
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

	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.)

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

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 SYSTEMS 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

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

Date Feb 10, 2005 Name Harold Lake
(Authorized Inspector)

Expires: 17-Oct-08

Signed [Signature]
(Inspector)

Commission ALBERTA
(Not Board (incl. Endorsements) 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>1257</u> (Manufacturer Serial Number)	
	<u>R 9975.2</u> (CRN #)	<u>HV-44 Rev. 4</u> (Drawing No.)	<u>23</u> (National Board No.)	<u>2005</u> (Year Built)

[illegible]

Date September 7, 2005 Name  Commission AB# 144A NB# 12369A
(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
 (Description of vessel part (shell, two-piece head, tube bundle))
CL01011 Rev 5
 (Mat'l. Bd. No.)
12988 to 12996 Inclusive
 (Mfg's serial No.)
OH4712 231
 (CRN)

5. ASME Code, Section VIII, Div. 1 2004 Edition
 (Edition and Addenda (date))
N/A
 (Drawing prepared by)
2005
 (Year built)
N/A
 (Special Service per UG-120(d))

6. -Shell (a) No. of course(s): One (b) Overall length (ft & in.): 0 Feet - 5.00 inches

No.	Diameter, in.	Length (ft & in.)	Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
				Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.
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
 (Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.)
 (b) 7.750-2-Modified Stub ACME-2G
 (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
(a) End	0.613	1/8									Yes	N/A
(b)												N/A

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

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

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 Filling	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 Commissions AB 136A
 (Authorized Inspector) (Nat'l Board Incl. endorsement, State, Province and No.)



ATTN: Dave

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: AHSC05, AHSC09,
AHSC11 & AHSC12

SEE U4



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

Inspections Performed for: FMC Technologies Completion – Grand Junction	
Inspection Report for: HS-0031 Fuel Gas Scrubber	
Remaining Life: 20+ YRS	Date Last Inspected: 09/25/2018
Representative Corrosion Rate: 1.5 MPY	Next UT: 09/25/2019 Next VT: 09/25/2019
Manufacturer: Micoda Process Systems	Manufacturer Serial #: 1260
Year Built: 2005	National Board #: None
Alberta Registration #: None	Canadian Registration #: T1592.23

HS-0031 Fuel Gas Scrubber



PRESSURE VESSEL INVENTORY

☒ Code

☐ Code-invalidated

☐ Non-Code

☐ Unknown

☐ Code-Exempt

VESSEL ID INFORMATION

Company Name : Pure Energy Services (USA) Inc.
Facility/Location Name : Grand Junction District
Field Name :
Equipment Number : HS-0031
Eq/Circ. ID : HS0031-FGS
Equipment Name/Service : Fuel Gas Scrubber
Physical Location : On location near Parachute, CO area
GPS Coordinates :

VESSEL DESCRIPTION AND SERVICE CONDITIONS

Type of Vessel: Vertical Fuel Gas Scrubber

Vessel Size: 8.625"

Operating Pressure Range (psig):

Operating Temperature Range (°F):

Does the vessel have Internal Access? No

Specify type of internal access, if available:

Vessel is located: Inside

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

Is there a Long Seam?

Any stamping pertaining to materials of construction?

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

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

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

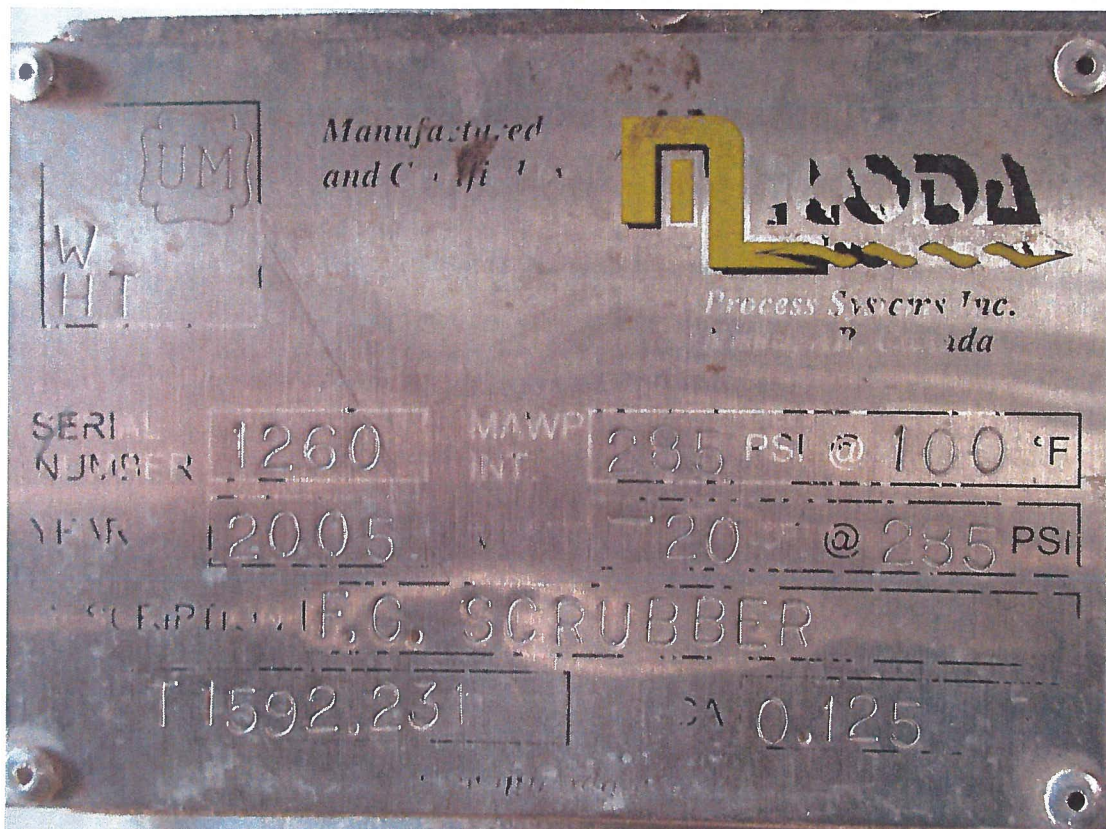
Approximate Date built or installed (check associated equipment or info at facility) _____

Any other pertinent information: _____

PRESSURE VESSEL INVENTORY

ORIGINAL VESSEL NAMEPLATE/STAMPING INFORMATION

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



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 Form ☐ U2 or U4 Supplemental Forms

☐ Documentation relating to repair/alteration/rerating work: (R-1 form, calculations, revised drawings, inspection reports, etc.)

Name: Robert W. Menke

Date: 02/7/2012

API 510 PRESSURE VESSEL EXTERNAL INSPECTION REPORT

Company Name: FMC Technologies Completion	
Field/Location: Grand Junction	
Equipment Number: HS-0031	Eq/Circ. ID: HS0031-FGS
Equipment Name/Service: Fuel Gas Scrubber	
Physical Location: RDI Yard	
Manufacturer: Micoda Process Systems	Manufacturer Serial #: 1260
Year Built: 2005	National Board #: None
Alberta Registration #: None	Canadian Registration #: T1592.23

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 is legible the painted wording is worn and difficult to read.

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 deck/frame. Skirt welded to baseplate on skid. Light surface corrosion on skirt.

Condition of Steel Supports, Saddles, and Bolting: The skirt-to-head attachment weld has no visual weld defects. All structural support welds appear sound. The vessel support skirt has moderate visible surface corrosion.

Condition of Paint and/or Insulation: The paint is in acceptable condition with minor no chipping and peeling. The support skirt has moderate chipping and scaling on the inside. The vessel is not insulated.

Condition of Nozzles, Flanges, Repads, and Weepholes: All threaded connections. There is no evidence of leaks at any of the threaded connections. The bottom threaded connection inside skirt has light surface peeling.

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): 11/2015

Comments:

Vessel appears to be in acceptable condition.

Recommendations:

Repairs Needed:

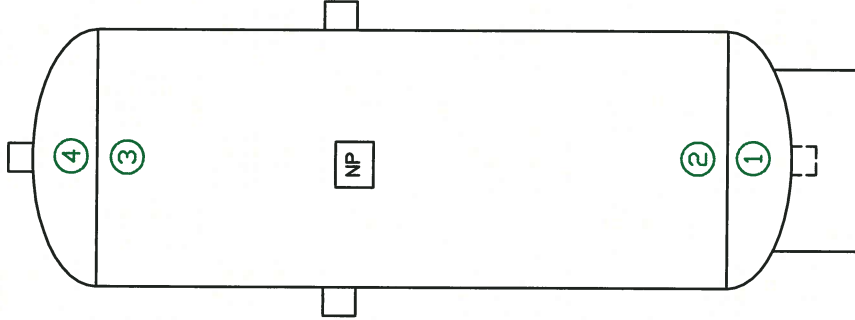
Robert W. Menke/BGW/MK
API 510 Inspector Signature

0131
API 510 Inspector Number

09/25/2018
Date

EQUIP RETIREMENT DATE: 4/27/2186
NEXT INSPECTION IS DUE: 9/25/2019

- #1. 01- BTM HD-FRONT 0. 310 TC
#1. 02- BTM HD-LEFT 0. 320 TC
#1. 04- BTM HD-RIGHT 0. 314 TC
#2. 01- BTM SHELL-FRONT 0. 303 TC
#2. 02- BTM SHELL-LEFT 0. 316 TC
#2. 04- BTM SHELL-RIGHT 0. 292 TC
#3. 01- TOP SHELL-FRONT 0. 310 TC
#3. 02- TOP SHELL-LEFT 0. 324 TC
#3. 04- TOP SHELL-RIGHT 0. 322 DC
#4. 01- TOP HD-FRONT 0. 366 TC
#4. 02- TOP HD-LEFT 0. 365 TC
#4. 04- TOP HD-RIGHT 0. 363 TC



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

TC-560

NAMEPLATE INFO	
MFG	MICODA PROCESS SYSTEMS
SERIAL NUMBER	1260
NATIONAL BOARD #	NONE
DATE BUILT	2005
DESIGN P & T	285 PSI @ 100°F
NOTE	UM STAMPED CRN T1592.23

CAL BLK=66°F		VESSEL=65°F	
BUSINESS UNIT	FMC TECHNOLOGIES	COMPLETION	
EQ/CIRC ID #	HS0031-FGS		
EQUIP NAME	VERTICAL FUEL GAS SCRUBBER		
LOCATION	INSIDE SKID UNIT HS-0031		
DWG #	HS0031-FGS		

DESC: VERT. FUEL GAS SCRUBBER
DWG#: HS0031-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-0031

Eq/Circ ID: HS0031-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: VERTICAL FUEL GAS SCRUBBER; SN:1260

Summary: Group Name:

Insp. Due Date = 09/25/2019

Pred. Ret. Date = 04/27/2186

Group Description:

RCR = 1.5 MPY

Rem. Life (from last survey 09/25/2018) = 167.6 yrs

0 C.A. Status: NO

Total Caution TMLs = 0

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	BTM HD-FRONT	N *	0.324		04/26/2007	0.308 RR		02/13/2016	0.310 TC		09/25/2018	0	1.2	1.9	10.3	0.201 S	1.2	07/27/2109	09/25/2019
1.02	BTM HD-LEFT	N *	0.323		04/26/2007	0.315 RR		02/13/2016	0.319 RR		09/25/2018	0	0.4	0.7	7.7	0.210 S	0.4	03/29/2291	09/25/2019
1.04	BTM HD-RIGHT	N *	0.321		04/26/2007	0.320 RR		02/13/2016	0.314 TC		09/25/2018	2.3	0.6	0.5	6.4	0.210 S	2.3	12/14/2063	09/25/2019
2.01	BTM SHELL-FRONT	N *	0.314		04/26/2007	0.306 TC		02/13/2016	0.303 TC		09/25/2018	1.1	1.0	1.2	20.5	0.193 S	1.1	07/22/2118	09/25/2019
2.02	BTM SHELL-LEFT	N	0.315		04/26/2007	0.314 RR		02/13/2016	0.316 TC		09/25/2018	0	0	0.1	6.4	0.193 S	0.1	10/04/3248	09/25/2019
2.04	BTM SHELL-RIGHT	N *	0.295		04/26/2007	0.289 RR		02/13/2016	0.292 TC		09/25/2018	0	0.3	0.6	5.0	0.193 S	0.3	09/27/2348	09/25/2019
3.01	TOP SHELL-FRONT	N *	0.318		04/26/2007	0.311 RR		02/13/2016	0.310 TC		09/25/2018	0.4	0.7	0.8	1.7	0.193 S	0.7	11/17/2185	09/25/2019
3.02	TOP SHELL-LEFT	N	0.326		04/26/2007	0.322 RR		02/13/2016	0.324 TC		09/25/2018	0	0.2	0.3	15.4	0.193 S	0.2	09/30/2673	09/25/2019
3.04	TOP SHELL-RIGHT	N	0.316		04/26/2007	0.312 RR		02/13/2016	0.316 RR		09/25/2018	0	0	0.2	2.0	0.193 S	0.1	10/04/3248	09/25/2019
4.01	TOP HD-FRONT	N	0.369		04/26/2007	0.366 RR		02/13/2016	0.366 TC		09/25/2018	0	0.3	0.3	2.6	0.210 S	0.3	09/29/2538	09/25/2019
4.02	TOP HD-LEFT	N	0.366		04/26/2007	0.360 RR		02/13/2016	0.365 TC		09/25/2018	0	0.1	0.5	5.1	0.210 S	0.1	10/07/3568	09/25/2019
4.04	TOP HD-RIGHT	N	0.363		04/26/2007	0.363 RR		02/13/2016	0.363 TC		09/25/2018	0	0	0.2	15.4	0.210 S	0.1	10/07/3548	09/25/2019

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-0031
Eq/Circ ID: HS0031-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: VERTICAL FUEL GAS SCRUBBER; SN:1260

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 : 0.6 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 1.5 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 0.8 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 1.5 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 = 167.6 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 04/27/2186

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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.

**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**

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

2. Manufactured for Pure Energy Services LTD. #300, 1010-1st S.W. Calgary Alberta, Canada T2K-1K1
(Name and address of Purchaser)

3. Location of installation Portable
(Name and address)

4. Type Vertical Fuel Gas Scrubber 1.00 cu/ft 1260
(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	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	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)

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 [Signature]
(Manufacturer) (Representative)
Signed [Signature]
(Certified Individual)

API 570 Piping External Inspection

Company Name: FMC Technologies	District: Grand Junction
Line Name/Number: HS-0031 Associated Piping	
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°F	Note Stamping (If Any)
P&ID#:	Flange Rating: 900#/150 for PSV Outlet

Reason for Inspection: ☐ Initial API-570 on Stream Inspection.
☒ Scheduled API-570 External Inspection. ☐ Other:

Testing Performed:

☒ Visual ☒ UT ☐ PT ☐ MT ☐ Other:

Comments:

Insulation Observations:	Comments:
☐ 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	Minor chipped and scratched 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	There are no signs of past leaks while units was in service.

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.

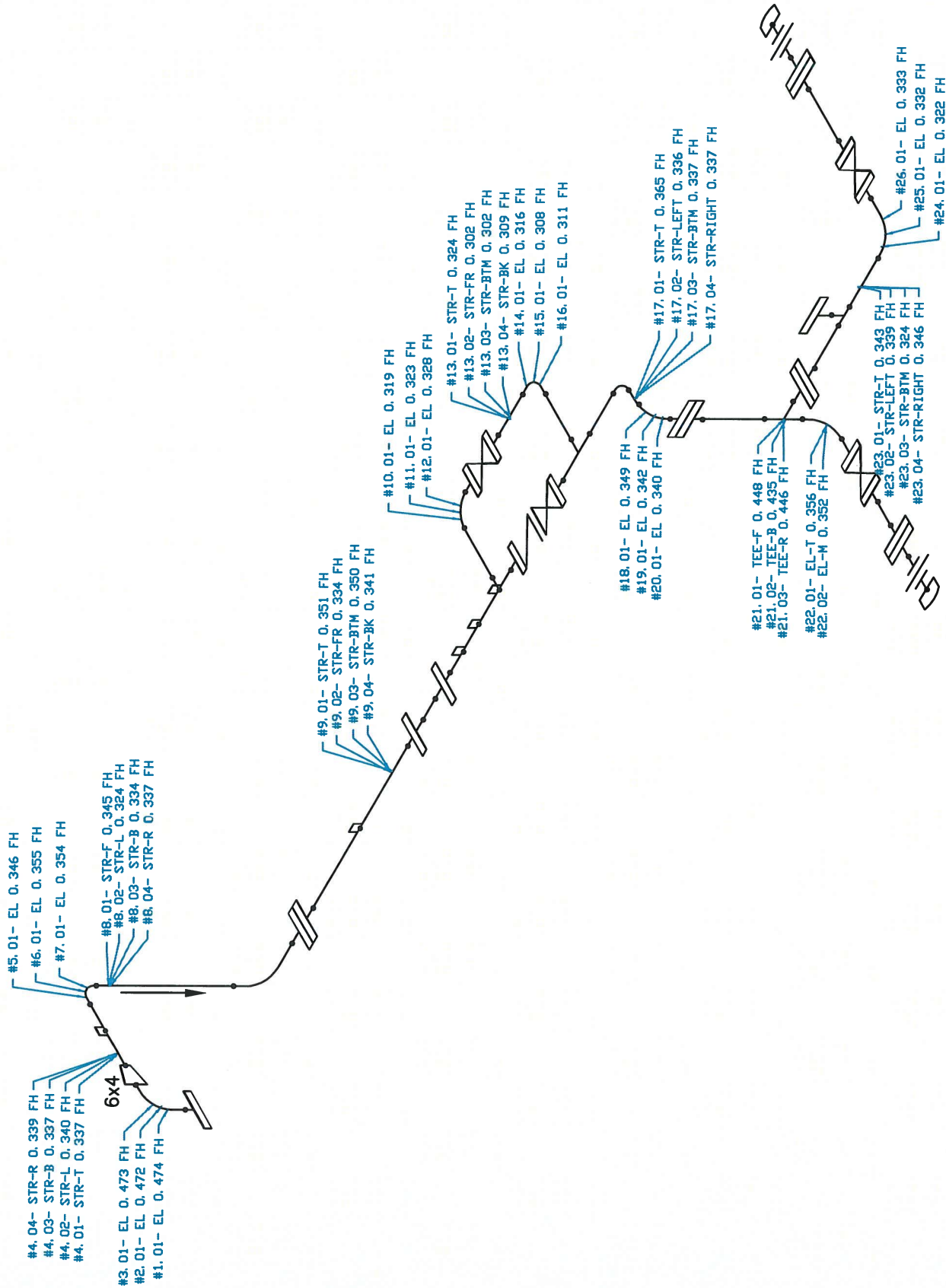
Relief Device:	Comments:
☒ PSV ☐ No PSV ☐ Rupture Disk ☒ Atmospheric ☐ No Relief Device Identified For This Equipment ☒ Tag Secure and Legible ☒ Set Pressure At Or Below MAWP ☐ Block Valve Not Locked/Car Sealed In Open Position ☐ Improper Drain Hole/Weather Cap On Atmos. Discharge ☐ Obstruction (i.e. Debris) ☐ Relief Installed In A Position Other Than Horiz. Or Upright ☐ Other ☒ No Issues	There are (2) PSVs set at 2000 & 2160. psi, tested 11/2015

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	Vertical support brackets are acceptable. Light surface corrosion present. Multiple loose bolt brackets (see drawing). Secure all brackets before unit is placed in service.

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. There is light surface corrosion. (5) bolts lack full engagement. (pgs 3 & 6).

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 cap/vent deadlegs present. There are no visible issues. Damaged and/or deformed hammer unions.

EQUIP RETIREMENT DATE: 3/5/2075
NEXT INSPECTION IS DUE: 9/25/2019



HS0031-P1

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

FH2E-D

PIPE=66-67°F
CAL BLK=60°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-0031
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 INCH SCH80 PIPE - GAS OUT LINES

Summary: Group Name: Insp. Due Date = 09/25/2019
Pred. Ret. Date = 03/05/2075

Group Description:
RCR = 2.4 MPY
Rem. Life (from last survey 09/25/2018) = 56.4 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
1.01	EL	N	0.482	04/26/2007	0.471 D5	02/13/2016	0.471 RR	09/25/2018	0	1.0	0.7	4.0	0.303 P	1.0	07/27/2186	09/25/2019
2.01	EL	N	0.478	04/26/2007	0.468 D5	02/13/2016	0.468 RR	09/25/2018	0	0.9	0.8	3.8	0.303 P	0.9	11/20/2201	09/25/2019
3.01	EL	N	0.483	04/26/2007	0.472 D5	02/13/2016	0.472 RR	09/25/2018	0	1.0	0.7	1.9	0.303 P	1.0	07/27/2187	09/25/2019
4.01	STR-T	N	0.348	04/26/2007	0.336 D5	02/13/2016	0.336 RR	09/25/2018	0	1.1	1.0	3.8	0.206 P	1.1	12/26/2136	09/25/2019
4.02	STR-L	N	0.345	04/26/2007	0.338 D5	02/13/2016	0.338 RR	09/25/2018	0	0.6	0.7	3.9	0.206 P	0.6	11/12/2238	09/25/2019
4.03	STR-B	N	0.346	04/26/2007	0.337 D5	02/13/2016	0.337 FH	09/25/2018	0	0.8	0.6	1.9	0.206 P	0.8	07/31/2182	09/25/2019
4.04	STR-R	N	0.347	04/26/2007	0.339 D5	02/13/2016	0.339 FH	09/25/2018	0	0.7	0.4	7.6	0.206 P	0.7	11/05/2208	09/25/2019
5.01	EL	N	0.359	04/26/2007	0.346 RR	02/13/2016	0.346 FH	09/25/2018	0	1.1	1.2	7.0	0.206 P	1.1	01/28/2146	09/25/2019
6.01	EL	N	0.365	04/26/2007	0.358 RR	02/13/2016	0.355 FH	09/25/2018	1.1	0.9	1.0	4.9	0.206 P	1.1	04/05/2154	09/25/2019
7.01	EL	N	0.364	04/26/2007	0.352 D5	02/13/2016	0.352 RR	09/25/2018	0	1.1	1.1	5.7	0.206 P	1.1	07/14/2151	09/25/2019
8.01	STR-F	N	0.359	04/26/2007	0.347 RR	02/13/2016	0.345 FH	09/25/2018	0.8	1.2	1.2	4.3	0.206 P	1.2	08/19/2134	09/25/2019
8.02	STR-L	N	0.335	04/26/2007	0.326 RR	02/13/2016	0.324 FH	09/25/2018	0.8	1.0	1.1	3.0	0.206 P	1.0	10/23/2136	09/25/2019
8.03	STR-B	N	0.345	04/26/2007	0.329 RR	02/13/2016	0.333 RR	09/25/2018	0	1.1	1.6	11.8	0.206 P	1.1	04/05/2134	09/25/2019
8.04	STR-R	N	0.347	04/26/2007	0.340 D5	02/13/2016	0.337 FH	09/25/2018	1.1	0.9	0.7	12.8	0.206 P	1.1	11/23/2137	09/25/2019
9.01	STR-T	N	0.350	04/26/2007	0.348 D5	02/13/2016	0.348 RR	09/25/2018	0	0.2	0.5	10.8	0.206 P	0.2	02/15/2729	09/25/2019
9.02	STR-FR	N	0.342	04/26/2007	0.337 RR	02/13/2016	0.334 FH	09/25/2018	1.1	0.7	0.6	3.8	0.206 P	1.1	03/03/2135	09/25/2019
9.03	STR-BTM	N	0.356	04/26/2007	0.340 RR	02/13/2016	0.343 RR	09/25/2018	0	1.1	1.4	9.0	0.206 P	1.1	05/08/2143	09/25/2019
9.04	STR-BK	N	0.350	04/26/2007	0.339 RR	02/13/2016	0.341 FH	09/25/2018	0	0.8	0.3	4.5	0.206 P	0.8	07/31/2187	09/25/2019
10.01	EL	N	0.316	04/26/2007	0.310 D5	02/13/2016	0.310 RR	09/25/2018	0	0.5	0.2	4.7	0.160 P	0.5	05/31/2318	09/25/2019
11.01	EL	N	0.321	04/26/2007	0.306 D5	02/13/2016	0.306 RR	09/25/2018	0	1.3	1.3	7.6	0.160 P	1.3	12/01/2130	09/25/2019

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-0031
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 INCH SCH80 PIPE - GAS OUT LINES

Summary: Group Name: Insp. Due Date = 09/25/2019
Pred. Ret. Date = 03/05/2075

Group Description:
RCR = 2.4 MPY
Rem. Life (from last survey 09/25/2018) = 56.4 yrs

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

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
12.01	EL	N	0.328		04/26/2007	0.311 D5		02/13/2016	0.311 RR		09/25/2018	0	1.5	1.5	8.5	0.160 P	1.5	04/18/2119	09/25/2019
13.01	STR-T	N	0.335		04/26/2007	0.321 D5		02/13/2016	0.321 RR		09/25/2018	0	1.2	1.1	7.8	0.160 P	1.2	10/07/2152	09/25/2019
13.02	STR-FR	N *	0.315		04/26/2007	0.308 D5		02/13/2016	0.302 FH		09/25/2018	2.3	1.1	1.0	3.2	0.160 P	2.3	05/26/2080	09/25/2019
13.03	STR-BTM	N	0.303		04/26/2007	0.298 RR		02/13/2016	0.302 FH		09/25/2018	0	0.1	0	2.0	0.160 P	0.1	02/15/3437	09/25/2019
13.04	STR-BK	N	0.316		04/26/2007	0.310 RR		02/13/2016	0.309 FH		09/25/2018	0.4	0.6	0.5	1.8	0.160 P	0.6	10/19/2266	09/25/2019
14.01	EL	N	0.304		04/26/2007	0.308 D5		02/13/2016	0.308 RR		09/25/2018	0	0	0	3.8	0.160 P	0.1	02/15/3497	09/25/2019
15.01	EL	N	0.297		04/26/2007	0.304 RR		02/13/2016	0.308 FH		09/25/2018	0	0	0	6.4	0.160 P	0.1	02/15/3497	09/25/2019
16.01	EL	N	0.301		04/26/2007	0.315 D5		02/13/2016	0.311 FH		09/25/2018	1.5	0	0	1.5	0.160 P	1.5	04/18/2119	09/25/2019
17.01	STR-T	N	0.370		04/26/2007	0.360 D5		02/13/2016	0.360 RR		09/25/2018	0	0.9	0.7	4.7	0.206 P	0.9	12/06/2189	09/25/2019
17.02	STR-LEFT	N	0.344		04/26/2007	0.333 RR		02/13/2016	0.335 RR		09/25/2018	0	0.8	0.9	4.0	0.206 P	0.8	01/30/2180	09/25/2019
17.03	STR-BTM	N	0.346		04/26/2007	0.337 D5		02/13/2016	0.337 FH		09/25/2018	0	0.8	0.6	2.8	0.206 P	0.8	07/31/2182	09/25/2019
17.04	STR-RIGHT	N	0.348		04/26/2007	0.333 D5		02/13/2016	0.333 RR		09/25/2018	0	1.3	0.9	5.7	0.206 P	1.3	06/26/2116	09/25/2019
18.01	EL	N	0.363		04/26/2007	0.349 RR		02/13/2016	0.349 FH		09/25/2018	0	1.2	1.7	16.0	0.206 P	1.2	12/18/2137	09/25/2019
19.01	EL	N	0.355		04/26/2007	0.338 RR		02/13/2016	0.340 RR		09/25/2018	0	1.3	1.6	10.0	0.206 P	1.3	11/14/2121	09/25/2019
20.01	EL	N	0.345		04/26/2007	0.335 D5		02/13/2016	0.335 RR		09/25/2018	0	0.9	0.6	4.0	0.206 P	0.9	02/25/2162	09/25/2019
21.01	TEE-F	N *	0.466		04/26/2007	0.463 RR		02/13/2016	0.448 FH		09/25/2018	5.7	1.6	1.2	9.0	0.206 P	5.7	03/15/2061	09/25/2019
21.02	TEE-B	N	0.433		04/26/2007	0.442 D5		02/13/2016	0.435 FH		09/25/2018	2.7	0	0	2.7	0.206 P	2.7	07/31/2103	09/25/2019
21.03	TEE-R	N	0.443		04/26/2007	0.440 D5		02/13/2016	0.440 RR		09/25/2018	0	0.3	0	92.0	0.206 P	0.3	12/31/2798	09/25/2019
22.01	EL-T	N	0.354		04/26/2007	0.342 RR		02/13/2016	0.349 RR		09/25/2018	0	0.4	0.9	7.5	0.206 P	0.4	06/05/2376	09/25/2019
22.02	EL-M	N	0.333 D5		02/13/2016			N/A	0.333 RR		09/25/2018	N/A	0	N/A	0	0.206 P	0.1	07/05/3289	09/25/2019
23.01	STR-T	N	0.361		04/26/2007	0.347 D5		02/13/2016	0.343 FH		09/25/2018	1.5	1.6	1.3	6.0	0.206 P	1.6	05/29/2104	09/25/2019

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-0031
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 INCH SCH80 PIPE - GAS OUT LINES

Summary: Group Name:

Insp. Due Date = 09/25/2019
Pred. Ret. Date = 03/05/2075

Group Description:

RCR = 2.4 MPY
Rem. Life (from last survey 09/25/2018) = 56.4 yrs

O.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 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
23.02	STR-LEFT	N *	0.346		04/26/2007	0.344 D5		02/13/2016	0.339 FH		09/25/2018	1.9	0.6	0.4	1.9	0.206 P	1.9	10/09/2088	09/25/2019
23.03	STR-BTM	N	0.324		04/26/2007	0.322 D5		02/13/2016	0.322 RR		09/25/2018	0	0.2	0.2	1.9	0.206 P	0.2	02/13/2599	09/25/2019
23.04	STR-RIGHT	N	0.356		04/26/2007	0.343 D5		02/13/2016	0.343 RR		09/25/2018	0	1.1	0.6	7.0	0.206 P	1.1	05/08/2143	09/25/2019
24.01	EL	N *	0.345		04/26/2007	0.332 RR		02/13/2016	0.322 FH		09/25/2018	3.8	2.0	0.6	3.8	0.206 P	3.8	04/12/2049	09/25/2019
25.01	EL	N *	0.344		04/26/2007	0.327 D5		02/13/2016	0.327 RR		09/25/2018	0	1.5	1.1	3.5	0.206 P	1.5	06/14/2099	09/25/2019
26.01	EL	N *	0.348		04/26/2007	0.321 RR		02/13/2016	0.323 RR		09/25/2018	0	2.2	2.5	8.8	0.206 P	2.2	12/13/2071	09/25/2019

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-0031
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 INCH SCH80 PIPE - GAS OUT LINES

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 : 2.4 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 1.4 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 2.4 MPY

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

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

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

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

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

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

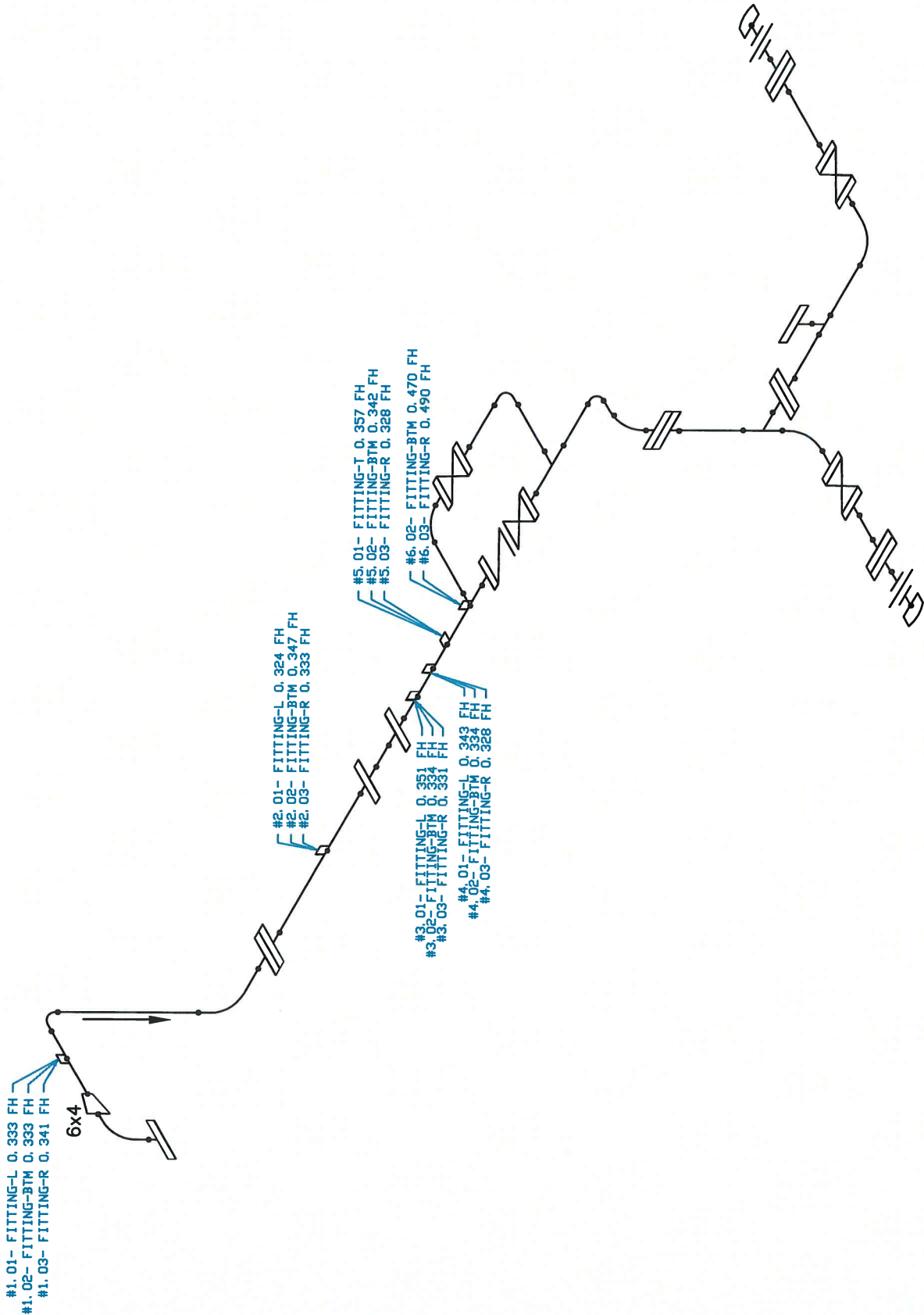
Eq/Circ ID Estimated life = 56.4 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 03/05/2075

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 8/2/2037
NEXT INSPECTION IS DUE: 9/25/2019



PIPING 66-67°F
CAL BLK 60°F

FH2E-D

DESC: 6,4,3 SCH 80 PIPE - GAS OUT LINES
DWG#: GAS-OUT-SP-1.01-6.03

HS0031-P1

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-0031
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 INCH SCH80 PIPE - GAS OUT LINES

Summary: Group Name: Insp. Due Date = 09/25/2019
Pred. Ret. Date = 08/02/2037

Group Description:
RCR = 2.2 MPY
Rem. Life (from last survey 09/25/2018) = 18.9 yrs

O 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	
1.01	FITTING-L	N	0.336		02/14/2013	0.323	RR	02/13/2016	0.333	FH	09/25/2018	0	0.5	0.8	12.9	0.303	P	0.5	05/26/2078	09/25/2019
1.02	FITTING-BTM	N *	0.336		02/14/2013	0.329	D5	02/13/2016	0.329	RR	09/25/2018	0	1.2	1.4	6.0	0.303	P	1.2	04/05/2040	09/25/2019
1.03	FITTING-R	N *	0.343		02/14/2013	0.336	D5	02/13/2016	0.336	RR	09/25/2018	0	1.2	1.3	4.7	0.303	P	1.2	02/03/2046	09/25/2019
2.01	FITTING-L	N *	0.332		02/14/2013	0.329	D5	02/13/2016	0.324	FH	09/25/2018	1.9	1.4	1.3	3.2	0.303	P	1.9	09/12/2029	09/25/2019
2.02	FITTING-BTM	N	0.349		02/14/2013	0.341	RR	02/13/2016	0.347	FH	09/25/2018	0	0.4	0.5	8.0	0.303	P	0.4	04/26/2128	09/25/2019
2.03	FITTING-R	N	0.336		02/14/2013	0.335	D5	02/13/2016	0.333	FH	09/25/2018	0.8	0.5	0.6	3.8	0.303	P	0.8	01/10/2056	09/25/2019
3.01	FITTING-L	N	0.356		02/14/2013	0.350	RR	02/13/2016	0.351	FH	09/25/2018	0	0.9	0.6	5.3	0.303	P	0.9	11/18/2071	09/25/2019
3.02	FITTING-BTM	N *	0.339		02/14/2013	0.319	RR	02/13/2016	0.334	FH	09/25/2018	0	0.9	0.4	12.8	0.303	P	0.9	12/28/2052	09/25/2019
3.03	FITTING-R	N *	0.345		02/14/2013	0.331	D5	02/13/2016	0.331	FH	09/25/2018	0	2.5	2.9	11.4	0.303	P	2.5	11/12/2029	09/25/2019
4.01	FITTING-L	N	0.349		02/14/2013	0.344	D5	02/13/2016	0.343	FH	09/25/2018	0.4	1.1	1.2	4.7	0.206	P	1.1	05/08/2143	09/25/2019
4.02	FITTING-BTM	N	0.336		02/14/2013	0.338	D5	02/13/2016	0.334	FH	09/25/2018	1.5	0.4	0.3	2.6	0.206	P	1.5	02/13/2104	09/25/2019
4.03	FITTING-R	N	0.336		02/14/2013	0.329	D5	02/13/2016	0.328	FH	09/25/2018	0.4	1.4	1.5	4.7	0.206	P	1.4	12/07/2105	09/25/2019
5.01	FITTING-T	N	0.362	TC	02/14/2013	0.356	D5	02/13/2016	0.356	RR	09/25/2018	0	1.1	1.3	6.6	0.206	P	1.1	03/03/2155	09/25/2019
5.02	FITTING-BTM	N	0.346	TC	02/14/2013	0.340	RR	02/13/2016	0.341	RR	09/25/2018	0	0.9	0.6	5.3	0.303	P	0.9	10/08/2060	09/25/2019
5.03	FITTING-R	N *	0.342	TC	02/14/2013	0.326	D5	02/13/2016	0.326	RR	09/25/2018	0	2.9	3.3	14.2	0.303	P	2.9	08/10/2026	09/25/2019
6.02	FITTING-BTM	N	0.417		02/14/2013	0.426	RR	02/13/2016	0.470	FH	09/25/2018	0	0	0	0	0.303	P	0.1	02/04/3687	09/25/2019
6.03	FITTING-R	N	0.439		02/14/2013	0.430	RR	02/13/2016	0.487	RR	09/25/2018	0	0	0	6.0	0.303	P	0.1	02/05/3857	09/25/2019

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-0031
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 INCH SCH80 PIPE - GAS OUT LINES

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 : 1.1 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 2.2 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 1.4 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 2.2 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).

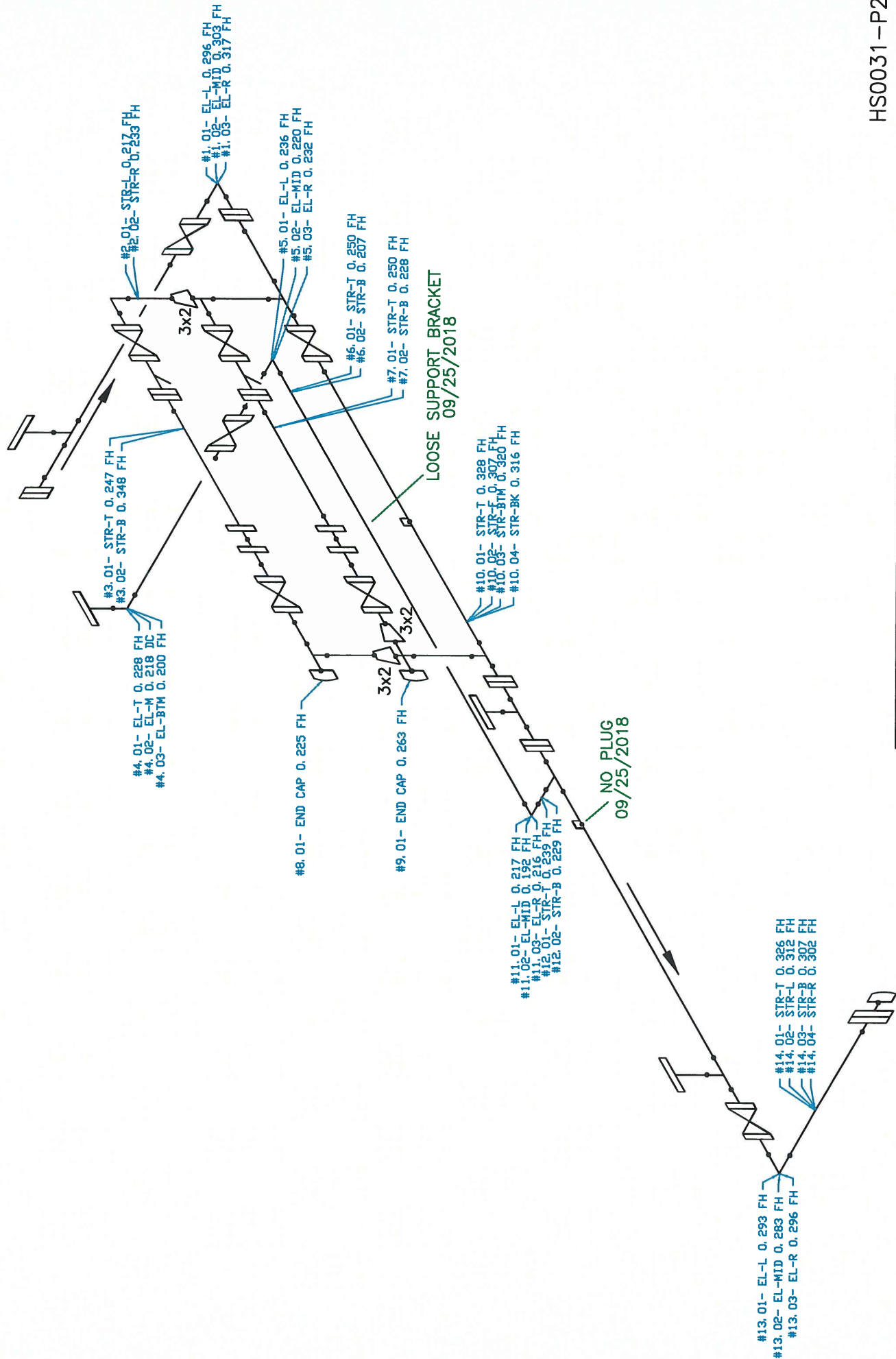
Eq/Circ ID Estimated life = 18.9 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 08/02/2037

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 5/29/2050
NEXT INSPECTION IS DUE: 9/25/2019



DESC: OIL OUT-2,3 SCH 80 PIPE
DWG#: OIL-OUT-1.01-14.04

PIPING 68°F
CAL BLK 60°F

FH2E-D

HS0031-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-0031
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 LINES

Summary: Group Name: Insp. Due Date = 09/25/2019
Pred. Ret. Date = 05/29/2050

Group Description:
RCR = 2.8 MPY
Rem. Life (from last survey 09/25/2018) = 31.7 yrs

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

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
1.01	EL-L	N *	0.310	02/26/2009	0.305 RR	02/13/2016	0.296 FH	09/25/2018	3.4	1.5	1.3	3.9	0.168 P	3.4	04/20/2056	09/25/2019
1.02	EL-MID	N	0.305	04/26/2007	0.294 D5	02/13/2016	0.294 RR	09/25/2018	0	1.0	1.1	3.9	0.168 P	1.0	06/19/2144	09/25/2019
1.03	EL-R	N	0.298	02/26/2009	0.297 RR	02/13/2016	0.299 RR	09/25/2018	0	0	0	2.9	0.168 P	0.1	01/25/3326	09/25/2019
2.01	STR-L	N	0.216	04/26/2007	0.217 RR	02/13/2016	0.217 FH	09/25/2018	0	0	0	2.0	0.114 P	0.1	12/05/3046	09/25/2019
2.02	STR-R	N	0.234	04/26/2007	0.220 RR	02/13/2016	0.228 RR	09/25/2018	0	0.5	1.0	10.3	0.114 P	0.5	09/27/2246	09/25/2019
3.01	STR-T	N	0.244	04/26/2007	0.236 RR	02/13/2016	0.247 FH	09/25/2018	0	0	0.3	6.4	0.114 P	0.1	10/05/3348	09/25/2019
3.02	STR-B	N	0.244	04/26/2007	0.240 D5	02/13/2016	0.240 RR	09/25/2018	0	0.4	0.4	4.9	0.114 P	0.4	09/28/2333	09/25/2019
4.01	EL-T	N	0.207	02/26/2009	0.220 D5	02/13/2016	0.220 RR	09/25/2018	0	0	0	5.9	0.114 P	0.1	12/05/3076	09/25/2019
4.02	EL-M	N	0.201	01/22/2014	0.197 D5	02/13/2016	0.197 RR	09/25/2018	0	0.9	0.8	1.9	0.114 P	0.9	10/03/2110	09/25/2019
4.03	EL-BTM	N *	0.214	01/22/2014	0.200 D5	02/13/2016	0.200 FH	09/25/2018	0	3.0	2.9	6.8	0.114 P	3.0	05/04/2047	09/25/2019
5.01	EL-L	N	0.230	02/26/2009	0.230 RR	02/13/2016	0.236 FH	09/25/2018	0	0	0	4.9	0.114 P	0.1	10/04/3238	09/25/2019
5.02	EL-MID	N	0.235	04/26/2007	0.219 D5	02/13/2016	0.219 RR	09/25/2018	0	1.4	1.6	7.7	0.114 P	1.4	09/25/2093	09/25/2019
5.03	EL-R	N	0.234	02/26/2009	0.227 RR	02/13/2016	0.232 FH	09/25/2018	0	0.2	0.9	12.7	0.114 P	0.2	09/30/2608	09/25/2019
6.01	STR-T	N	0.252	04/26/2007	0.243 D5	02/13/2016	0.243 RR	09/25/2018	0	0.8	0.8	2.9	0.114 P	0.8	12/27/2179	09/25/2019
6.02	STR-B	N	0.210	04/26/2007	0.210 D5	02/13/2016	0.207 FH	09/25/2018	1.1	0.3	0.1	9.6	0.114 P	1.1	04/13/2103	09/25/2019
7.01	STR-T	N	0.252	04/26/2007	0.244 RR	02/13/2016	0.245 RR	09/25/2018	0	0.6	0.7	5.1	0.114 P	0.6	01/26/2237	09/25/2019
7.02	STR-B	N	0.236	04/26/2007	0.233 RR	02/13/2016	0.228 FH	09/25/2018	1.9	0.7	0.5	2.0	0.114 P	1.9	09/25/2078	09/25/2019
8.01	END CAP	N *	0.226	04/26/2007	0.192 RR	02/13/2016	0.202 RR	09/25/2018	0	2.1	2.4	11.5	0.114 P	2.1	08/21/2060	09/25/2019
9.01	END CAP	N	0.244	04/26/2007	0.232 RR	02/13/2016	0.247 RR	09/25/2018	0	0	0.2	6.9	0.168 P	0.1	01/21/2806	09/25/2019
10.01	STR-T	N	0.324	04/26/2007	0.320 D5	02/13/2016	0.320 RR	09/25/2018	0	0.4	0.4	1.9	0.168 P	0.4	01/25/2398	09/25/2019

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-0031
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 LINES

Summary: Group Name:
Insp. Due Date = 09/25/2019
Pred. Ret. Date = 05/29/2050

Group Description:
RCR = 2.8 MPY
Rem. Life (from last survey 09/25/2018) = 31.7 yrs

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

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
10.02	STR-F	N	0.317	04/26/2007	0.303 RR	02/13/2016	0.307 FH	09/25/2018	0	0.9	1.3	4.3	0.168 P	0.9	11/18/2172	09/25/2019
10.03	STR-BTM	N	0.311	04/26/2007	0.309 D5	02/13/2016	0.309 RR	09/25/2018	0	0.2	0	3.8	0.168 P	0.2	05/28/2722	09/25/2019
10.04	STR-BK	N	0.307	04/26/2007	0.306 D5	02/13/2016	0.306 RR	09/25/2018	0	0.1	0	7.7	0.168 P	0.1	01/26/3396	09/25/2019
11.01	EL-L	N	0.222	02/26/2009	0.208 RR	02/13/2016	0.215 RR	09/25/2018	0	0.7	0.5	5.9	0.114 P	0.7	01/08/2163	09/25/2019
11.02	EL-MID	N *	0.229	04/26/2007	0.183 D5	02/13/2016	0.183 RR	09/25/2018	0	4.0	4.2	7.9	0.114 P	4.0	12/26/2035	09/25/2019
11.03	EL-R	N	0.219	02/26/2009	0.205 D5	02/13/2016	0.205 RR	09/25/2018	0	1.5	1.1	10.8	0.114 P	1.5	05/26/2079	09/25/2019
12.01	STR-T	N	0.251	04/26/2007	0.243 RR	02/13/2016	0.239 FH	09/25/2018	1.5	1.1	0.7	2.0	0.114 P	1.5	01/26/2102	09/25/2019
12.02	STR-B	N *	0.219	04/26/2007	0.180 D5	02/13/2016	0.180 RR	09/25/2018	0	3.4	3.8	33.6	0.114 P	3.4	02/22/2038	09/25/2019
13.01	EL-L	N	0.293	02/26/2009	0.284 RR	02/13/2016	0.291 RR	09/25/2018	0	0.2	0.5	12.8	0.168 P	0.2	05/26/2632	09/25/2019
13.02	EL-MID	N *	0.304	04/26/2007	0.273 RR	02/13/2016	0.277 RR	09/25/2018	0	2.4	2.3	5.7	0.168 P	2.4	01/14/2064	09/25/2019
13.03	EL-R	N	0.303	02/26/2009	0.284 D5	02/13/2016	0.284 RR	09/25/2018	0	2.0	1.9	5.8	0.168 P	2.0	08/06/2076	09/25/2019
14.01	STR-T	N	0.335	04/26/2007	0.310 RR	02/13/2016	0.321 RR	09/25/2018	0	1.2	1.8	14.8	0.168 P	1.2	01/04/2146	09/25/2019
14.02	STR-L	N	0.311	04/26/2007	0.309 D5	02/13/2016	0.309 RR	09/25/2018	0	0.2	0.2	3.0	0.168 P	0.2	05/28/2722	09/25/2019
14.03	STR-B	N	0.305	04/26/2007	0.303 D5	02/13/2016	0.303 RR	09/25/2018	0	0.2	0.3	6.4	0.168 P	0.2	05/26/2692	09/25/2019
14.04	STR-R	N	0.307	04/26/2007	0.301 D5	02/13/2016	0.301 RR	09/25/2018	0	0.5	0.3	8.6	0.168 P	0.5	03/14/2284	09/25/2019

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-0031
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 LINES

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 : 1.1 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 2.8 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 1.3 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 2.8 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).

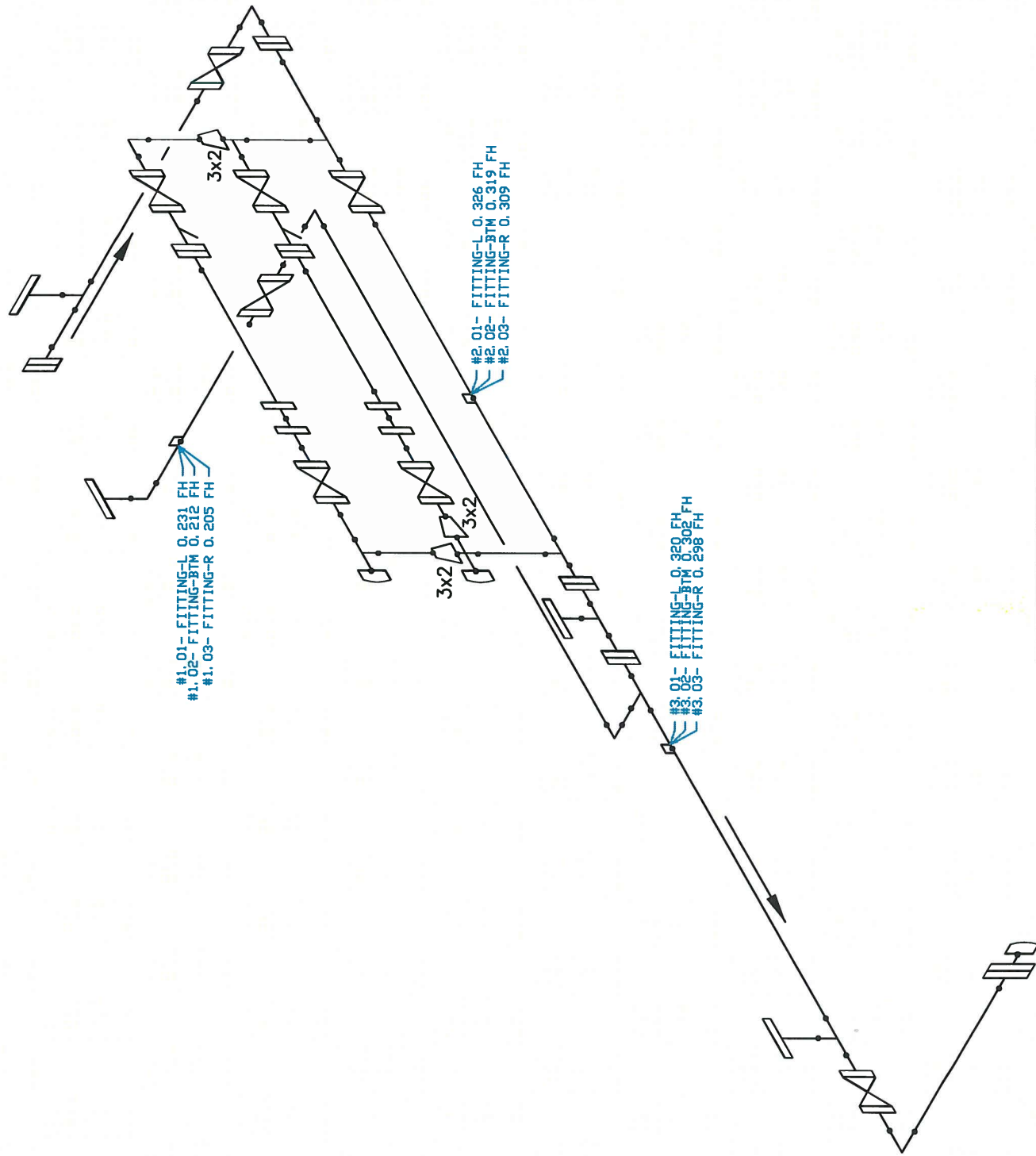
Eq/Circ ID Estimated life = 31.7 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 05/29/2050

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 10/24/2086
NEXT INSPECTION IS DUE: 9/25/2019



PIPING 68°F
CAL BLK 60°F

FH2E-D

DESC: 2,3 SCH 80 PIPE - OIL OUT LINES
DWG#: OIL-OUT-SP-1.01-3.03

HS0031-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-0031

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 LINES

Summary: Group Name:

Insp. Due Date = 09/25/2019

Pred. Ret. Date = 10/24/2086

Group Description:

RCR = 3.3 MPY

Rem. Life (from last survey 09/25/2018) = 68.1 yrs

0 C.A. Status: No

Total Caution TMLs = 0

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-L	N *	0.233		02/14/2013	0.220 RR	0.220 RR	02/13/2016	0.228 RR	RR	09/25/2018	0	0.9	1.1	12.9	0.168 P	0.9	02/06/2085	09/25/2019
1.02	FITTING-BTM	N *	0.217		02/14/2013	0.212 RR	0.212 RR	02/13/2016	0.212 FH	FH	09/25/2018	0	0.9	1.0	5.0	0.168 P	0.9	04/28/2067	09/25/2019
1.03	FITTING-R	N *	0.202		02/14/2013	0.210 D5	0.210 D5	02/13/2016	0.205 FH	FH	09/25/2018	1.9	0	0	3.9	0.168 P	1.9	01/24/2038	09/25/2019
2.01	FITTING-L	N	0.319		02/14/2013	0.312 D5	0.312 D5	02/13/2016	0.312 RR	RR	09/25/2018	0	1.2	1.5	7.6	0.114 P	1.2	08/02/2183	09/25/2019
2.02	FITTING-BTM	N	0.310		02/14/2013	0.308 D5	0.308 D5	02/13/2016	0.308 RR	RR	09/25/2018	0	0.4	0.4	10.3	0.114 P	0.4	09/29/2503	09/25/2019
2.03	FITTING-R	N *	0.314		02/14/2013	0.311 D5	0.311 D5	02/13/2016	0.309 FH	FH	09/25/2018	0.8	0.9	1.0	4.7	0.168 P	0.9	02/07/2175	09/25/2019
3.01	FITTING-L	N	0.316		02/14/2013	0.315 D5	0.315 D5	02/13/2016	0.315 RR	RR	09/25/2018	0	0.2	0.2	1.9	0.114 P	0.2	10/03/3023	09/25/2019
3.02	FITTING-BTM	N *	0.303		02/14/2013	0.292 D5	0.292 D5	02/13/2016	0.292 RR	RR	09/25/2018	0	2.0	2.3	7.6	0.114 P	2.0	09/26/2107	09/25/2019
3.03	FITTING-R	N *	0.323		02/14/2013	0.304 D5	0.304 D5	02/13/2016	0.298 FH	FH	09/25/2018	2.3	4.5	5.1	16.1	0.168 P	4.5	07/25/2047	09/25/2019

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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-0031
Eq/Circ ID: OIL OUT-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: 2,3 INCH SCH 80 PIPE - OIL OUT LINES

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 : 1.4 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 3.3 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 2.0 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 3.3 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 = 68.1 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

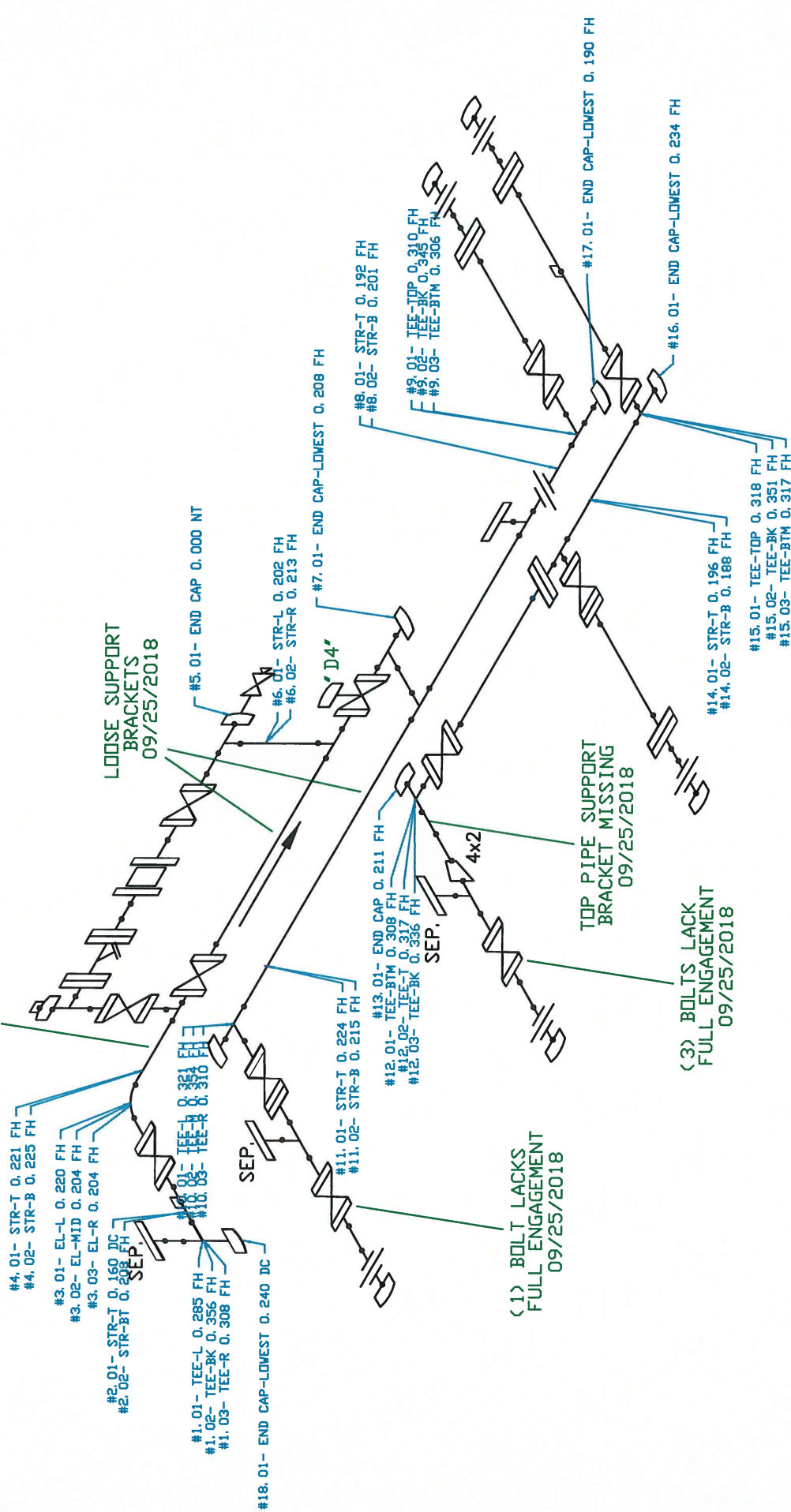
Predicted Eq/Circ ID Retirement date is 10/24/2086

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 5/31/2029
NEXT INSPECTION IS DUE: 9/25/2019

REMOVED SUPPORT
BRACKET RUBBING
AGAINST PIPE
09/25/2018



DESC: WATER OUT-2 SCH 80 PIPE
DWG#: WATER-OUT-1.01-18.01

PIPING 68°F
CAL BLK 60°F

FH2E-D

HS0031-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-0031
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: 2 INCH SCH 80 PIPE - WATER OUT LINES

Summary: Group Name:
Insp. Due Date = 09/25/2019
Pred. Ret. Date = 05/31/2029

Group Description:
RCR = 6.9 MPY
Rem. Life (from last survey 09/25/2018) = 10.7 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	TEE-L	N	0.323 RP	02/07/2012	0.293 D5	02/13/2016	0.285 FH	09/25/2018	3.1	5.7	0	96.0	0.114 P	5.7	09/13/2048	09/25/2019
1.02	TEE-BK	N	0.368 D5	02/13/2016		N/A	0.356 FH	09/25/2018	N/A	4.6	N/A	4.6	0.114 P	4.6	04/21/2071	09/25/2019
1.03	TEE-R	N	0.322 D5	02/13/2016		N/A	0.308 FH	09/25/2018	N/A	5.4	N/A	5.4	0.114 P	5.4	08/17/2054	09/25/2019
2.01	STR-T	N *	0.232 RP	02/07/2012	0.188 D5	02/13/2016	0.160 FH	09/25/2018	10.7	10.9	10.7	25.6	0.114 P	10.9	12/08/2022	09/25/2019
2.02	STR-BT	N	0.209 D5	02/13/2016		N/A	0.208 FH	09/25/2018	N/A	0.4	N/A	0.4	0.114 P	0.4	04/13/2253	09/25/2019
3.01	EL-L	N	0.195 RP	01/24/2015	0.195 RR	02/13/2016	0.207 RR	09/25/2018	0	0	0	26.9	0.114 P	0.1	10/01/2948	09/25/2019
3.02	EL-MID	N	0.205 RP	01/24/2015	0.200 D5	02/13/2016	0.200 RR	09/25/2018	0	1.4	1.1	10.3	0.114 P	1.4	02/29/2080	09/25/2019
3.03	EL-R	N	0.201 RP	01/24/2015	0.201 RR	02/13/2016	0.204 FH	09/25/2018	0	0	0	11.8	0.114 P	0.1	12/04/2916	09/25/2019
4.01	STR-T	N	0.235	04/26/2007	0.202 D5	02/13/2016	0.202 RR	09/25/2018	0	2.9	2.7	12.8	0.114 P	2.9	01/28/2049	09/25/2019
4.02	STR-B	N	0.220	04/26/2007	0.209 RR	02/13/2016	0.223 RR	09/25/2018	0	0	0	4.4	0.114 P	0.1	10/04/3108	09/25/2019
5.01	END CAP	N	1.518 RP	02/07/2012	1.511 RR	01/22/2014	1.508	01/24/2015	3.0	3.4	3.1	6.9	0.114 P	3.4	01/27/2425	01/24/2016
6.01	STR-L	N	0.228	04/26/2007	0.184 RR	02/13/2016	0.202 FH	09/25/2018	0	2.3	3.2	7.2	0.114 P	2.3	12/29/2056	09/25/2019
6.02	STR-R	N	0.219	04/26/2007	0.197 RR	02/13/2016	0.213 FH	09/25/2018	0	0.5	1.1	6.6	0.114 P	0.5	09/26/2216	09/25/2019
7.01	END CAP-LOWEST	N	0.178 RP	01/24/2015	0.178 RR	02/13/2016	0.184 RR	09/25/2018	0	0	0	3.9	0.114 P	0.1	10/01/2718	09/25/2019
8.01	STR-T	N *	0.207 RP	01/24/2015	0.199 D5	02/13/2016	0.192 FH	09/25/2018	2.7	4.1	3.8	9.7	0.114 P	4.1	10/04/2037	09/25/2019
8.02	STR-B	N *	0.232 RP	01/24/2015	0.205 D5	02/13/2016	0.201 FH	09/25/2018	1.5	8.4	7.1	25.6	0.114 P	8.4	02/02/2029	09/25/2019
9.01	TER-TOP	N	0.293 RP	01/24/2015	0.293 RR	02/13/2016	0.302 RR	09/25/2018	0	0	0	6.9	0.114 P	0.1	10/09/3898	09/25/2019
9.02	TEE-BK	N	0.359 RP	01/24/2015	0.345 D5	02/13/2016	0.345 FH	09/25/2018	0	3.8	3.1	13.3	0.114 P	3.8	07/10/2079	09/25/2019
9.03	TEE-BTM	N	0.306 RP	01/24/2015	0.306 RR	02/13/2016	0.306 FH	09/25/2018	0	0	0	9.2	0.114 P	0.1	10/10/3938	09/25/2019
10.01	TEE-L	N	0.203 RP	02/07/2012	0.203 RR	02/13/2016	0.301 RR	09/25/2018	0	0	0	0	0.114 P	0.1	10/09/3888	09/25/2019

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-0031
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: 2 INCH SCH 80 PIPE - WATER OUT LINES

Summary:

Group Description:

Insp. Due Date = 09/25/2019

RCR = 6.9 MPY

Pred. Ret. Date = 05/31/2029

Rem. Life (from last survey 09/25/2018) = 10.7 yrs

0 C.A. Status: NO

Total Caution TMLs = 0

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	
10.02	TEE-M	N	0.193	RP	02/07/2012	0.197	RR	02/13/2016	0.346	RR	09/25/2018	0	0	0	0	0.114	P	0.1	10/10/4018	09/25/2019
10.03	TEE-R	N	0.216	RP	02/07/2012	0.199	RR	02/13/2016	0.282	RR	09/25/2018	0	0	0	16.6	0.114	P	0.1	10/07/3698	09/25/2019
11.01	STR-T	N	0.240		04/26/2007	0.218	RR	02/13/2016	0.224	FH	09/25/2018	0	1.4	0.3	11.5	0.114	P	1.4	04/21/2097	09/25/2019
11.02	STR-B	N	0.226		04/26/2007	0.210	RR	02/13/2016	0.215	FH	09/25/2018	0	1.0	0.6	7.7	0.114	P	1.0	09/26/2119	09/25/2019
12.01	TEE-BTM	N	0.310		04/26/2007	0.294	D5	02/13/2016	0.294	RR	09/25/2018	0	1.4	0.8	5.7	0.114	P	1.4	04/23/2147	09/25/2019
12.02	TEE-T	N	0.322		02/26/2009	0.299	RR	02/13/2016	0.315	RR	09/25/2018	0	0.7	1.9	39.7	0.114	P	0.7	11/19/2305	09/25/2019
12.03	TEE-BK	N	0.351		02/26/2009	0.291	RR	02/13/2016	0.336	FH	09/25/2018	0	1.6	4.2	78.2	0.114	P	1.6	06/26/2157	09/25/2019
13.01	END CAP	N *	0.329		04/26/2007	0.180	RR	02/13/2016	0.202	RR	09/25/2018	0	11.1	9.7	32.0	0.114	P	11.1	08/30/2026	09/25/2019
14.01	STR-T	N	0.221		04/26/2007	0.204	RR	02/13/2016	0.196	FH	09/25/2018	3.1	2.2	2.0	4.8	0.114	P	3.1	03/08/2045	09/25/2019
14.02	STR-B	N *	0.217		04/26/2007	0.200	D5	02/13/2016	0.188	FH	09/25/2018	4.6	2.5	3.1	24.5	0.114	P	4.6	10/27/2034	09/25/2019
15.01	TEE-TOP	N	0.315		04/26/2007	0.311	RR	02/13/2016	0.318	FH	09/25/2018	0	0	0	3.0	0.114	P	0.1	10/10/4018	09/25/2019
15.02	TEE-BK	N	0.358		02/26/2009	0.334	D5	02/13/2016	0.334	RR	09/25/2018	0	2.5	1.8	18.0	0.114	P	2.5	09/26/2106	09/25/2019
15.03	TEE-BTM	N	0.312		02/26/2009	0.276	RR	02/13/2016	0.307	RR	09/25/2018	0	0.5	0.4	10.5	0.114	P	0.5	09/28/2404	09/25/2019
16.01	END CAP-LOWEST	N	0.207		02/26/2009	0.191	D5	02/13/2016	0.191	RR	09/25/2018	0	1.7	1.7	4.7	0.114	P	1.7	01/11/2064	09/25/2019
17.01	END CAP-LOWEST	N	0.152	RP	01/24/2015	0.152	RR	02/13/2016	0.162	RR	09/25/2018	0	0	0	25.2	0.114	P	0.1	09/28/2498	09/25/2019
18.01	END CAP-LOWEST	N *	0.215		02/07/2012	0.164	D5	02/13/2016	0.164	RR	09/25/2018	0	7.7	8.7	23.7	0.114	P	7.7	03/24/2025	09/25/2019

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-0031
Eq/Circ ID: WATER 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 INCH SCH 80 PIPE - WATER OUT LINES

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 : 6.9 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 3.2 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 6.9 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).

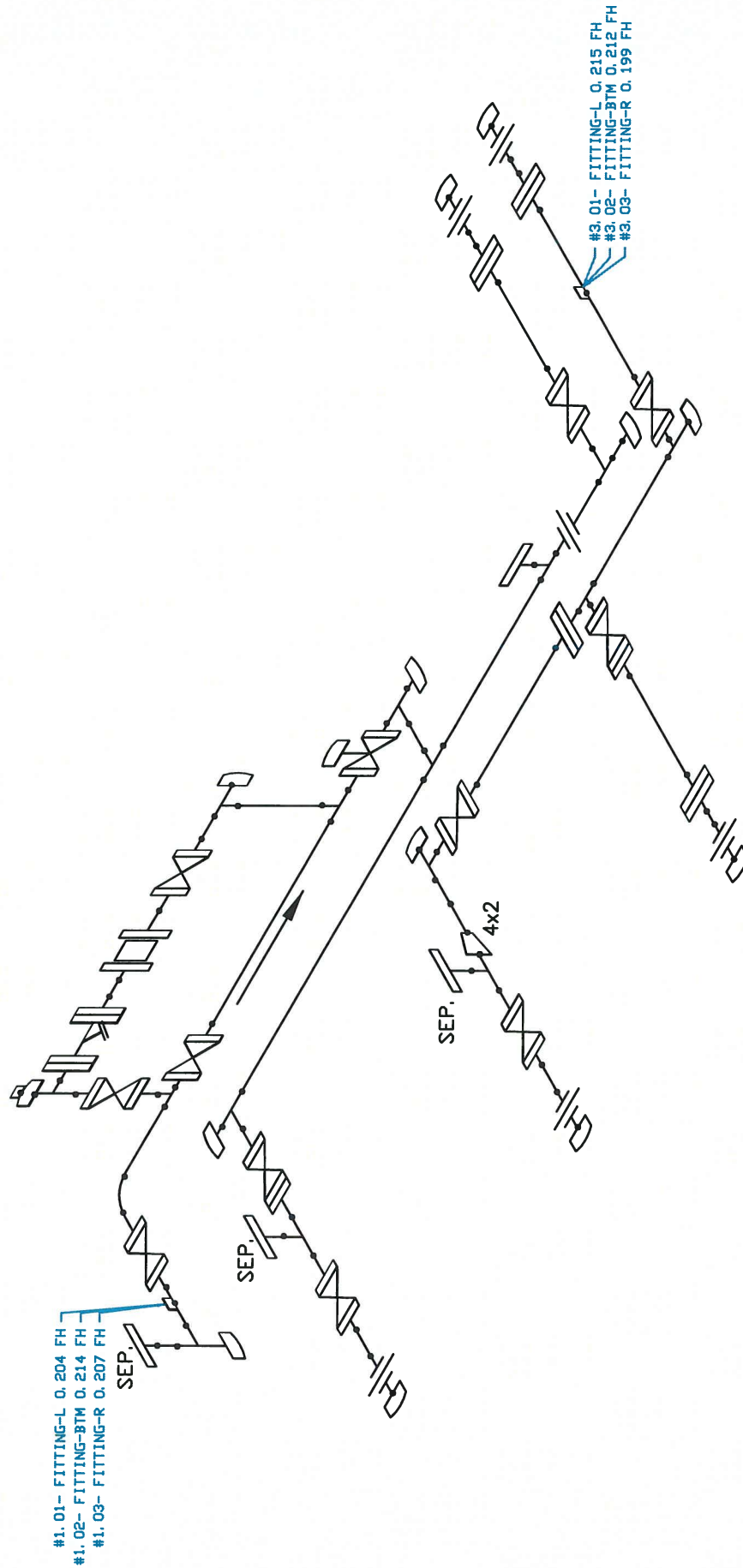
Eq/Circ ID Estimated life = 10.7 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 05/31/2029

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 9/1/2059
NEXT INSPECTION IS DUE: 9/25/2019



DESC: 2 INCH SCH 80 PIPE - WATER OUT LINES
DWG#: WATER-OUT-SP-1.01-3.03

PIPING 68°F
CAL BLK 60°F

FH2E-D

HS0031-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-0031
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: 2 INCH SCH 80 PIPE - WATER OUT LINES

Summary: Group Name: Group Description:
Insp. Due Date = 09/25/2019 RCR = 5.4 MPY
Pred. Ret. Date = 09/01/2059 Rem. Life (from last survey 09/25/2018) = 40.9 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 Thick P	Rep TML CR	TML Retirement Date	TML Inspection Date
1.01	FITTING-L	N *	0.231	02/14/2013	0.206 D5	02/13/2016	0.204 FH	09/25/2018	0.8	4.8	5.6	96.0	0.114 P	4.8	06/12/2037	09/25/2019
1.02	FITTING-BTM	N *	0.232	02/14/2013	0.216 D5	02/13/2016	0.214 FH	09/25/2018	0.8	3.2	3.7	13.3	0.114 P	3.2	12/04/2049	09/25/2019
1.03	FITTING-R	N *	0.241	02/14/2013	0.210 D5	02/13/2016	0.207 FH	09/25/2018	1.1	6.1	7.1	27.5	0.114 P	6.1	12/13/2033	09/25/2019
3.01	FITTING-L	N *	0.226	02/14/2013	0.214 D5	02/13/2016	0.214 RR	09/25/2018	0	2.1	2.6	13.3	0.114 P	2.1	05/09/2066	09/25/2019
3.02	FITTING-BTM	N *	0.210	02/14/2013	0.202 D5	02/13/2016	0.202 RR	09/25/2018	0	1.4	1.6	10.3	0.114 P	1.4	08/04/2081	09/25/2019
3.03	FITTING-R	N *	0.205	02/14/2013	0.198 D5	02/13/2016	0.198 RR	09/25/2018	0	1.2	1.6	26.9	0.114 P	1.2	09/25/2088	09/25/2019

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-0031
Eq/Circ ID: WATER OUT-SP
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM REI:

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

Description: 2 INCH SCH 80 PIPE - WATER OUT LINES

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 : 3.1 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 5.4 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 4.7 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 5.4 MPY

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

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

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

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

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

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

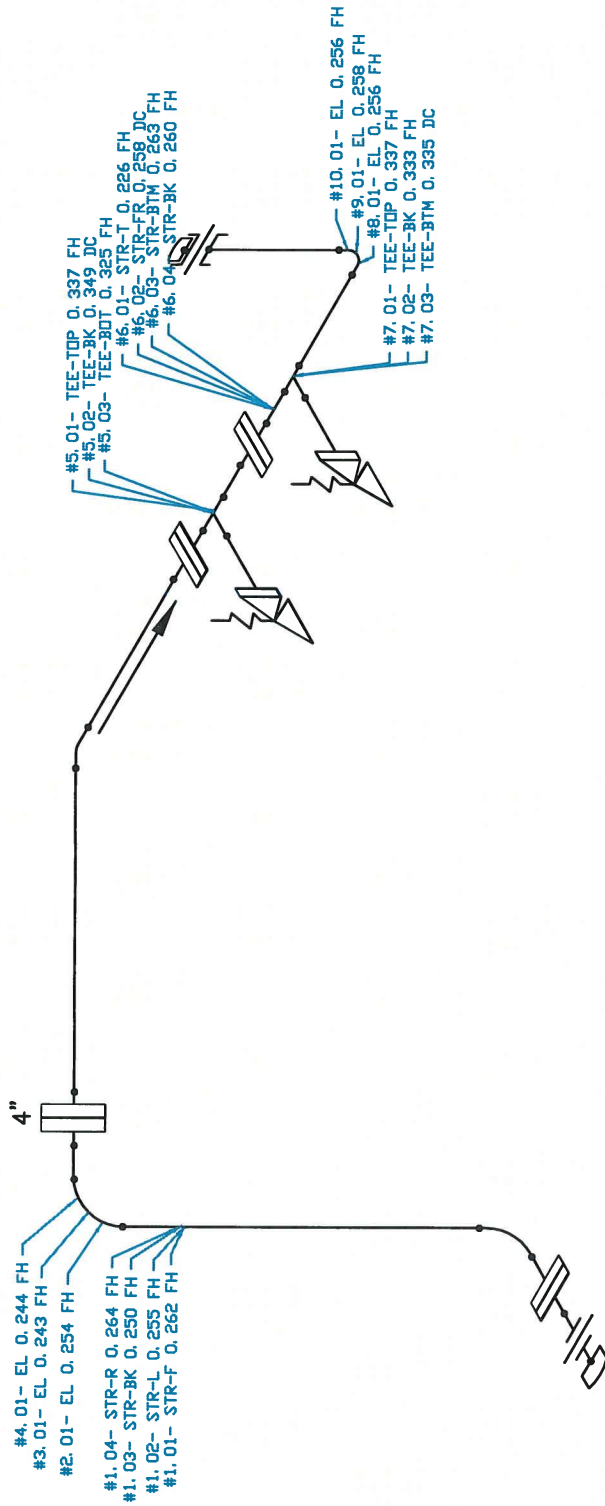
Eq/Circ ID Estimated life = 40.9 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 09/01/2059

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 2/23/2198
NEXT INSPECTION IS DUE: 9/25/2019



HS0031-P4

DESC: RELIEF LINE-IN SCH 40 PIPE
DWG#: RELIEF-1.01-10.01

FH2E-D

PIPING 67°F
CAL BLK 60°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-0031
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: 4 INCH SCH40 PIPE - RELIEF LINE

Summary: Group Name: Insp. Due Date = 09/25/2019
Pred. Ret. Date = 02/23/2198

Group Description:
RCR = 3.5 MPY

Rem. Life (from last survey 09/25/2018) = 179.4 Yrs

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

TML No	Location	Ctn	First Survey Thick	First Date	Previous Survey Thick	Previous Nt	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	0.245	04/26/2007	0.249 D5	0.249 D5	0.249 RR	09/25/2018	0	0	0	6.6	0.100 S	0.1	10/07/3508	09/25/2019
1.02	STR-L	N	0.233	04/26/2007	0.241 D5	0.241 D5	0.241 RR	09/25/2018	0	0	0	7.6	0.100 S	0.1	10/06/3428	09/25/2019
1.03	STR-BK	N *	0.242	04/26/2007	0.238 D5	0.238 D5	0.238 RR	09/25/2018	0	0.4	0	6.6	0.100 S	0.4	09/28/2363	09/25/2019
1.04	STR-R	N	0.258	04/26/2007	0.243 RR	0.243 RR	0.256 RR	09/25/2018	0	0.2	1.0	9.8	0.100 S	0.2	10/01/2798	09/25/2019
2.01	EL	N	0.237	04/26/2007	0.238 D5	0.238 D5	0.238 RR	09/25/2018	0	0	0	6.4	0.100 S	0.1	10/05/3398	09/25/2019
3.01	EL	N	0.229	04/26/2007	0.229 D5	0.229 D5	0.229 RR	09/25/2018	0	0	0	7.6	0.100 S	0.1	10/05/3308	09/25/2019
4.01	EL	N	0.231	04/26/2007	0.241 RR	0.241 RR	0.244 FH	09/25/2018	0	0	0	0	0.100 S	0.1	10/06/3458	09/25/2019
5.01	TEE-TOP	N	0.339	04/26/2007	0.336 D5	0.336 D5	0.336 RR	09/25/2018	0	0.3	0	9.5	0.100 S	0.3	06/01/2805	09/25/2019
5.02	TEE-BK	N *	0.357	04/26/2007	0.313 D5	0.313 D5	0.313 RR	09/25/2018	0	3.9	3.3	42.7	0.100 S	3.9	05/07/2073	09/25/2019
5.03	TEE-BOT	N	0.330	04/26/2007	0.319 RR	0.319 RR	0.325 FH	09/25/2018	0	0.4	0.6	3.8	0.100 S	0.4	03/30/2581	09/25/2019
6.01	STR-T	N *	0.258	04/26/2007	0.253 D5	0.253 D5	0.226 FH	09/25/2018	10.3	2.8	1.8	10.3	0.100 S	10.3	12/19/2030	09/25/2019
6.02	STR-FR	N	0.254	04/26/2007	0.257 D5	0.257 D5	0.257 RR	09/25/2018	0	0	0	7.6	0.100 S	0.1	10/07/3588	09/25/2019
6.03	STR-BTM	N *	0.270	04/26/2007	0.259 D5	0.259 D5	0.259 RR	09/25/2018	0	1.0	0.8	8.5	0.100 S	1.0	09/26/2177	09/25/2019
6.04	STR-BK	N *	0.249	04/26/2007	0.244 D5	0.244 D5	0.244 RR	09/25/2018	0	0.4	0.3	6.6	0.100 S	0.4	09/28/2378	09/25/2019
7.01	TEE-TOP	N	0.335	04/26/2007	0.329 D5	0.329 D5	0.329 RR	09/25/2018	0	0.5	0.4	9.5	0.100 S	0.5	09/28/2476	09/25/2019
7.02	TEE-BK	N *	0.351	04/26/2007	0.335 D5	0.335 D5	0.333 FH	09/25/2018	0.8	1.6	1.3	22.8	0.100 S	1.6	05/12/2164	09/25/2019
7.03	TEE-BTM	N	0.342	04/26/2007	0.336 RR	0.336 RR	0.335 FH	09/25/2018	0.4	0.6	0.9	17.6	0.100 S	0.6	05/29/2410	09/25/2019
8.01	EL	N	0.257	04/26/2007	0.249 RR	0.249 RR	0.253 RR	09/25/2018	0	0.4	0.5	35.6	0.100 S	0.4	03/29/2401	09/25/2019
9.01	EL	N	0.255	04/26/2007	0.251 RR	0.251 RR	0.256 RR	09/25/2018	0	0	0.2	4.3	0.100 S	0.1	10/07/3578	09/25/2019
10.01	EL	N	0.255	04/26/2007	0.247 RR	0.247 RR	0.255 RR	09/25/2018	0	0	0.4	8.0	0.100 S	0.1	10/07/3568	09/25/2019

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-0031
Eq/Circ ID: RELIEF
Design Code: B31.3
Eq Type: PIPING
Class: 2
CM RBI:

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

Description: 4 INCH SCH40 PIPE - RELIEF LINE

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 : 1.0 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 3.5 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 1.3 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 3.5 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).

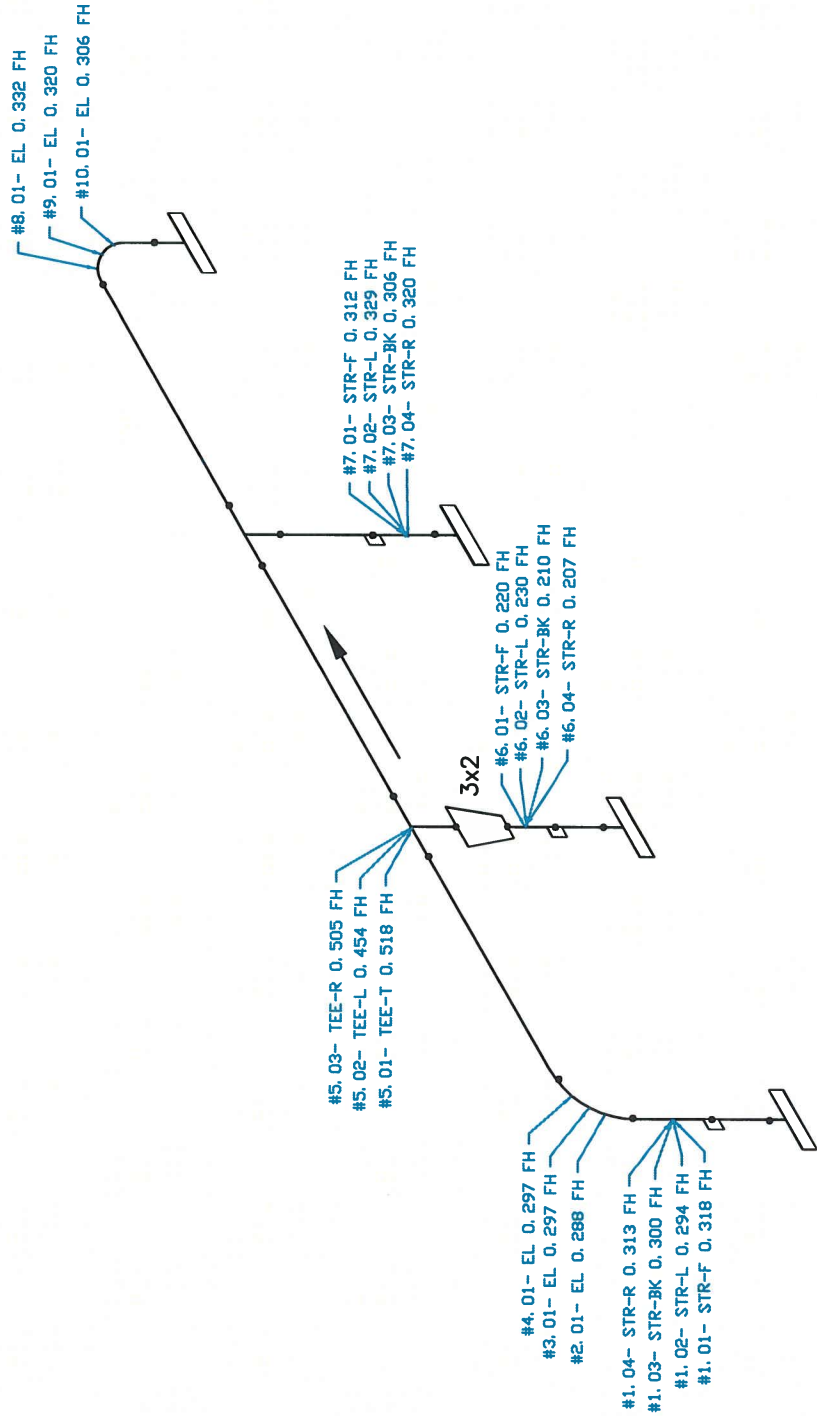
Eq/Circ ID Estimated life = 179.4 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 02/23/2198

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 10/24/2081
NEXT INSPECTION IS DUE: 9/25/2019



PIPING 68°F
CAL BLK 60°F

DESC: HEADER-2 IN SCH 80 PIPE
DWG#: HEADER-1.01-10.01

FH2E-D

HS0031-P5

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-0031
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: HEADER-3 & 2 INCH SCH80 PIPE

Summary: Group Name:
Insp. Due Date = 09/25/2019
Pred. Ret. Date = 10/24/2081

Group Description:
RCR = 2.9 MPY
Rem. Life (from last survey 09/25/2018) = 63.1 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
1.01	STR-F	N	0.306	04/26/2007	0.301 RR	02/13/2016	0.302 RR	09/25/2018	0	0.4	0.3	5.0	0.168 P	0.4	01/25/2353	09/25/2019
1.02	STR-L	N *	0.311	04/26/2007	0.301 D5	02/13/2016	0.294 FH	09/25/2018	2.7	1.5	0.9	13.3	0.168 P	2.7	05/26/2065	09/25/2019
1.03	STR-BK	N	0.299	04/26/2007	0.288 D5	02/13/2016	0.288 RR	09/25/2018	0	1.0	0.9	14.2	0.168 P	1.0	09/26/2138	09/25/2019
1.04	STR-R	N	0.314	04/26/2007	0.301 RR	02/13/2016	0.306 RR	09/25/2018	0	0.7	1.0	6.4	0.168 P	0.7	07/01/2215	09/25/2019
2.01	EL	N	0.289	04/26/2007	0.283 RR	02/13/2016	0.288 FH	09/25/2018	0	0.1	0.2	8.5	0.168 P	0.1	10/04/3218	09/25/2019
3.01	EL	N	0.305	04/26/2007	0.291 RR	02/13/2016	0.297 FH	09/25/2018	0	0.7	1.0	8.5	0.168 P	0.7	01/09/2203	09/25/2019
4.01	EL	N	0.294	04/26/2007	0.286 RR	02/13/2016	0.297 FH	09/25/2018	0	0	0	3.8	0.168 P	0.1	10/04/3308	09/25/2019
5.01	TEE-T	N	0.479	04/26/2007	0.482 RR	02/13/2016	0.493 RR	09/25/2018	0	0	0	5.0	0.168 P	0.1	10/10/4018	09/25/2019
5.02	TEE-L	N *	0.468	04/26/2007	0.467 D5	02/13/2016	0.454 FH	09/25/2018	5.0	1.2	0.9	5.0	0.168 P	5.0	12/07/2075	09/25/2019
5.03	TEE-R	N	0.450	04/26/2007	0.421 RR	02/13/2016	0.442 RR	09/25/2018	0	0.7	1.5	12.8	0.168 P	0.7	03/03/2410	09/25/2019
6.01	STR-F	N *	0.216	04/26/2007	0.202 D5	02/13/2016	0.202 RR	09/25/2018	0	1.2	1.3	6.6	0.114 P	1.2	01/25/2092	09/25/2019
6.02	STR-L	N *	0.215	04/26/2007	0.202 D5	02/13/2016	0.202 RR	09/25/2018	0	1.1	1.1	5.7	0.114 P	1.1	09/25/2098	09/25/2019
6.03	STR-BK	N *	0.215	04/26/2007	0.205 D5	02/13/2016	0.205 RR	09/25/2018	0	0.9	0.3	6.0	0.114 P	0.9	11/06/2119	09/25/2019
6.04	STR-R	N *	0.235	04/26/2007	0.219 RR	02/13/2016	0.207 FH	09/25/2018	4.6	2.5	2.0	10.0	0.114 P	4.6	11/29/2038	09/25/2019
7.01	STR-F	N	0.299	04/26/2007	0.298 D5	02/13/2016	0.298 RR	09/25/2018	0	0.1	0	3.0	0.168 P	0.1	10/05/3318	09/25/2019
7.02	STR-L	N	0.305	04/26/2007	0.301 D5	02/13/2016	0.301 RR	09/25/2018	0	0.4	0.3	3.8	0.168 P	0.4	03/30/2351	09/25/2019
7.03	STR-BK	N	0.307	04/26/2007	0.308 RR	02/13/2016	0.306 FH	09/25/2018	0.8	0.1	0	5.0	0.168 P	0.8	03/28/2191	09/25/2019
7.04	STR-R	N	0.299	04/26/2007	0.304 RR	02/13/2016	0.306 RR	09/25/2018	0	0	0	6.0	0.168 P	0.1	10/05/3398	09/25/2019
8.01	EL	N	0.311	04/26/2007	0.300 RR	02/13/2016	0.309 RR	09/25/2018	0	0.2	0.6	13.9	0.168 P	0.2	10/01/2723	09/25/2019
9.01	EL	N	0.298	04/26/2007	0.294 RR	02/13/2016	0.296 RR	09/25/2018	0	0.2	0.5	8.5	0.168 P	0.2	09/30/2658	09/25/2019

10.01	EL	N	0.295	04/26/2007	0.289 RR	02/13/2016	0.295 RR	09/25/2018	0	0	0.3	9.6	0.168	P	0.1	10/03/3288	09/25/2019
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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-0031
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: HEADER-3 & 2 INCH SCH80 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	:	1.0 MPY	
(B) -- Average Max 25.0% of TMLs, Min of 2	:	2.9 MPY	
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	1.3 MPY	
(D) -- Default Corrosion Rate	:	0.1 MPY	
Representative Corrosion Rate = 2.9 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).

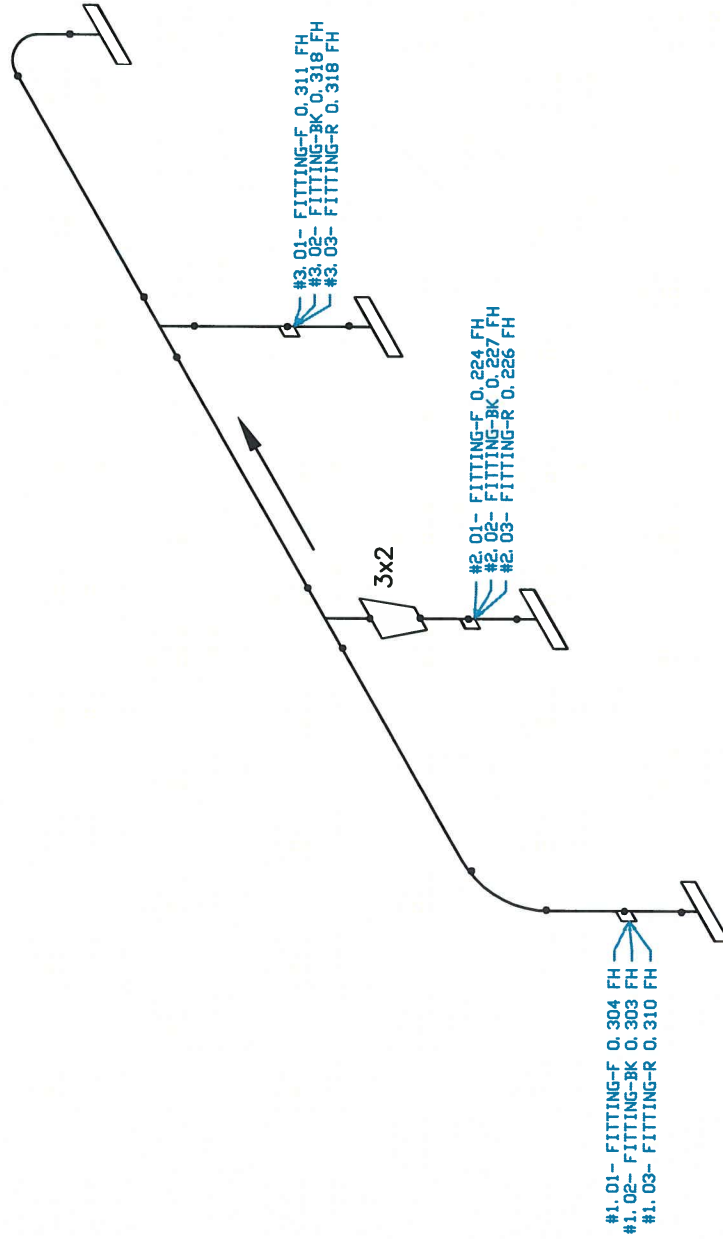
Eq/Circ ID Estimated life = 63.1 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 10/24/2081

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 7/30/2097
NEXT INSPECTION IS DUE: 9/25/2019



PIPING 68°F
CAL BLK 60°F

FH2E-D

DESC: 3, 2 INCH SCH 80 PIPE - HEADER
DWG#: HEADER-SP-1.01-3.03

HS0031-P5

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-0031
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: HEADER-3 & 2 INCH SCH80 PIPE

Summary: Group Name: Insp. Due Date = 09/25/2019
Pred. Ret. Date = 07/30/2097

Group Description:
RCR = 1.8 MPY
Rem. Life (from last survey 09/25/2018) = 78.8 yrs

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

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
1.01	FITTING-F	N *	0.309		02/14/2013	0.299 RR	0.299 RR	02/13/2016	0.303 RR	09/25/2018	0	1.1	0.7	8.5	0.168 P	1.1	03/21/2141	09/25/2019
1.02	FITTING-BK	N *	0.310		02/14/2013	0.299 RR	0.299 RR	02/13/2016	0.300 RR	09/25/2018	0	1.8	2.0	10.9	0.168 P	1.8	01/25/2092	09/25/2019
1.03	FITTING-R	N	0.303		02/14/2013	0.295 RR	0.295 RR	02/13/2016	0.308 RR	09/25/2018	0	0	0	5.0	0.168 P	0.1	10/06/3418	09/25/2019
2.01	FITTING-F	N *	0.234		02/14/2013	0.227 D5	0.227 D5	02/13/2016	0.224 FH	09/25/2018	1.1	1.8	2.0	4.7	0.168 P	1.8	11/04/2049	09/25/2019
2.02	FITTING-BK	N	0.227		02/14/2013	0.220 RR	0.220 RR	02/13/2016	0.226 RR	09/25/2018	0	0.2	0	8.5	0.168 P	0.2	05/25/2307	09/25/2019
2.03	FITTING-R	N *	0.229		02/14/2013	0.217 RR	0.217 RR	02/13/2016	0.224 RR	09/25/2018	0	0.9	0.5	8.5	0.168 P	0.9	08/27/2080	09/25/2019
3.01	FITTING-F	N *	0.303		02/14/2013	0.293 D5	0.293 D5	02/13/2016	0.293 RR	09/25/2018	0	1.8	2.1	6.6	0.168 P	1.8	03/06/2088	09/25/2019
3.02	FITTING-BK	N	0.312		02/14/2013	0.311 RR	0.311 RR	02/13/2016	0.314 RR	09/25/2018	0	0	0	2.1	0.168 P	0.1	01/27/3476	09/25/2019
3.03	FITTING-R	N *	0.313		02/14/2013	0.306 D5	0.306 D5	02/13/2016	0.306 RR	09/25/2018	0	1.2	1.4	5.0	0.168 P	1.2	07/06/2133	09/25/2019

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-0031
Eq/Circ ID: HEADER-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: HEADER-3 & 2 INCH SCH80 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 : 1.0 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 1.8 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 1.4 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 1.8 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).

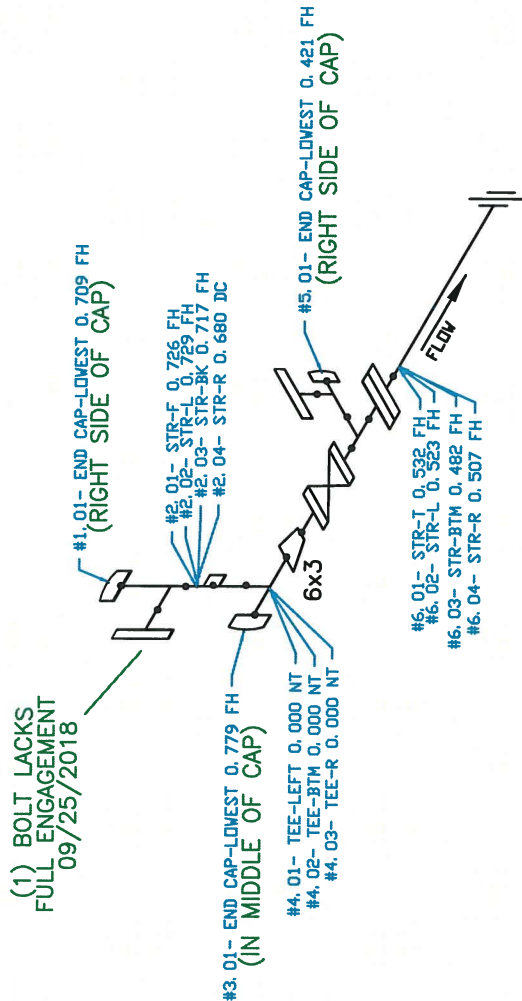
Eq/Circ ID Estimated life = 78.8 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 07/30/2097

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 7/11/2072
NEXT INSPECTION IS DUE: 9/25/2019



PIPING 68°F
CAL BLK 60°F

FH2E-D

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

HS0031-P6

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-0031
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: 6 AND 3 INCH SCH160 PIPE-GAS IN

Summary: Group Name: Insp. Due Date = 09/25/2019
Pred. Ret. Date = 07/11/2072

Group Description:
RCR = 10.1 MPY
Rem. Life (from last survey 09/25/2018) = 53.8 yrs

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

TM L 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	TM L Retirement Date	TM L Inspection Date
1.01	END CAP-LOWEST	N	0.704 RP		04/14/2010	0.685 RR		02/13/2016	0.701 RR		09/25/2018	0	0.4	1.4	10.9	0.319 P	0.4	12/24/2974	09/25/2019
2.01	STR-F	N	0.741 RP		04/14/2010	0.714 D5		02/13/2016	0.714 RR		09/25/2018	0	3.2	2.8	10.4	0.319 P	3.2	04/30/2142	09/25/2019
2.02	STR-L	N	0.742 RP		04/14/2010	0.720 D5		02/13/2016	0.720 RR		09/25/2018	0	2.6	2.2	8.0	0.319 P	2.6	02/26/2173	09/25/2019
2.03	STR-BK	N	0.723 RP		04/14/2010	0.697 D5		02/13/2016	0.697 RR		09/25/2018	0	3.1	2.7	8.6	0.319 P	3.1	10/30/2140	09/25/2019
2.04	STR-R	N	0.678 RP		04/14/2010	0.648 D5		02/13/2016	0.648 RR		09/25/2018	0	3.6	3.0	9.7	0.319 P	3.6	04/06/2110	09/25/2019
3.01	END CAP-LOWEST	N *	0.815 RP		01/24/2015	0.786 D5		02/13/2016	0.779 FH		09/25/2018	2.7	9.8	8.5	72.6	0.319 P	9.8	09/21/2065	09/25/2019
4.01	TEE-LEFT	N *	0.902 RP		04/14/2010	0.860		01/24/2015	0.849 D5		02/13/2016	10.4	9.1	7.4	15.9	0.319 P	10.4	02/16/2067	02/12/2017
4.02	TEE-BTM	N *	1.078 RP		04/14/2010	1.019		01/24/2015	1.019 RR		02/13/2016	0	10.1	11.6	46.1	0.319 P	10.1	06/22/2085	02/12/2017
4.03	TEE-R	N *	0.902 RP		04/14/2010	0.849		01/24/2015	0.849 RR		02/13/2016	0	9.1	7.8	23.9	0.319 P	9.1	05/31/2074	02/12/2017
5.01	END CAP-LOWEST	N	0.436		04/26/2007	0.401 RR		02/13/2016	0.408 RR		09/25/2018	0	2.5	3.5	7.5	0.168 P	2.5	08/18/2114	09/25/2019
6.01	STR-T	N	0.570		02/26/2009	0.521 RR		02/13/2016	0.525 RR		09/25/2018	0	4.7	4.4	14.9	0.168 P	4.7	08/20/2094	09/25/2019
6.02	STR-L	N	0.539		02/26/2009	0.509 RR		02/13/2016	0.523 FH		09/25/2018	0	1.7	1.7	8.3	0.168 P	1.7	05/28/2227	09/25/2019
6.03	STR-BTM	N *	0.533		02/26/2009	0.490 D5		02/13/2016	0.482 FH		09/25/2018	3.1	5.3	4.6	11.3	0.168 P	5.3	12/05/2077	09/25/2019
6.04	STR-R	N *	0.578		02/26/2009	0.520 D5		02/13/2016	0.507 FH		09/25/2018	5.0	7.4	6.6	18.0	0.168 P	7.4	07/04/2064	09/25/2019

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-0031
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: 6 AND 3 INCH SCH160 PIPE-GAS IN

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 : 5.3 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 10.1 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 7.1 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 10.1 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).

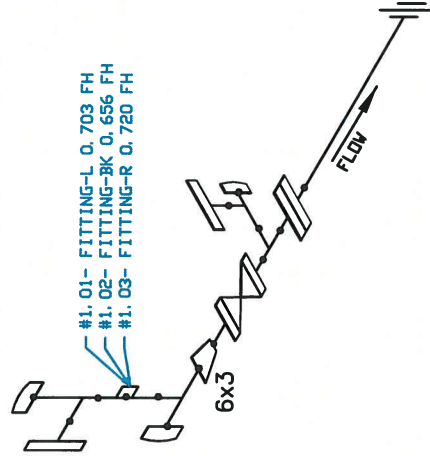
Eq/Circ ID Estimated life = 53.8 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 07/11/2072

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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: 10/1/2824
NEXT INSPECTION IS DUE: 9/25/2019



HS0031-P6

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

FH2E-D

PIPING 68°F
CAL BLK 60°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-0031
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: 6 AND 3 INCH SCH160 PIPE-GAS IN

Summary: Group Name: Insp. Due Date = 09/25/2019
Pred. Ret. Date = 10/01/2824
Group Description: RCR = 2.3 MPY
Rem. Life (from last survey 09/25/2018) = 806.0 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 *	0.695	0.695	02/14/2013	0.686	D5	02/13/2016	0.686	RR	0	1.6	1.9	7.8	0.319	P	06/02/2248	09/25/2019
1.02	FITTING-BK	N *	0.651	0.651	02/14/2013	0.652	RR	02/13/2016	0.654	RR	0	0	0	0	0.319	P	10/10/4018	09/25/2019
1.03	FITTING-R	N *	0.726	0.726	02/14/2013	0.714	D5	02/13/2016	0.714	RR	0	2.1	2.2	5.7	0.319	P	01/25/2207	09/25/2019

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-0031
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: 6 AND 3 INCH SCH160 PIPE-GAS IN

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 : 1.3 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2 : 1.9 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28) : 2.3 MPY
(D) -- Default Corrosion Rate : 0.1 MPY
Representative Corrosion Rate = 2.3 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 = 806.0 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 10/01/2824

Recommended Eq/Circ UT/RT Inspection Date is 09/25/2019
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.