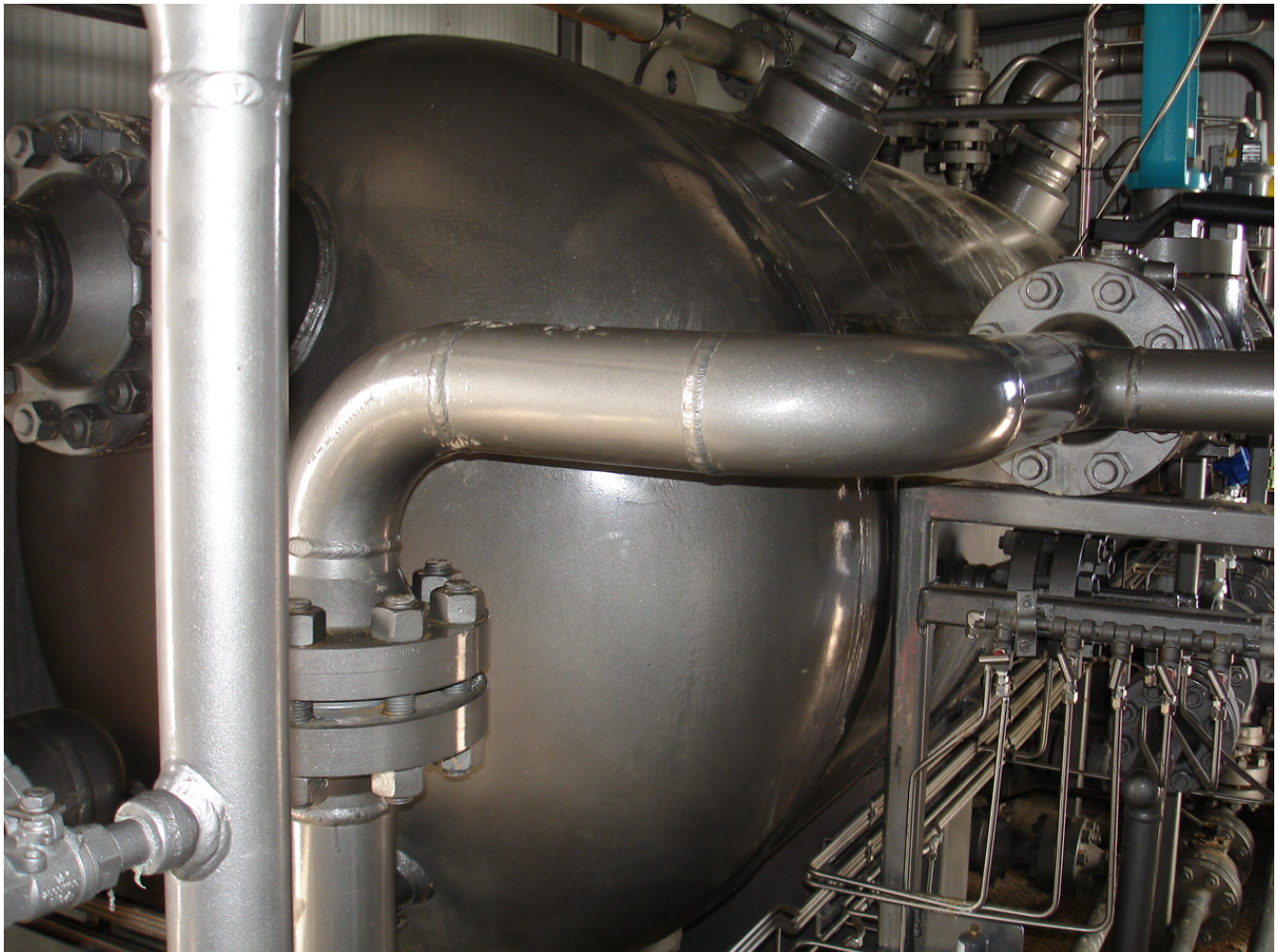




1595 So. Hwy 150, Suite F
Evanston, WY 82930

Inspections Performed for: FMC Technologies Completion – Grand Junction	
Inspection Report for: HS-0028 Horizontal Separator	
Remaining Life: 8.4 YRS	Date Last Inspected: 02/16/2016
Representative Corrosion Rate: 7.2 MPY	Next UT: 02/15/2017 Next VT: 02/15/2017
Manufacturer: Micoda Process Systems Inc.	Manufacturer Serial #: 1185
Year Built: 2005	National Board #: 11
Alberta Registration #: 502934	Canadian Registration #: R9975.2

HS-0028 Separator



PRESSURE VESSEL INVENTORY

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

VESSEL ID INFORMATION

Company Name : Pure Energy Services (USA)
Operations Center : Evanston, Wyoming
Field Name :
Facility/Lease/Well Name :
Equipment Number :
Eq/Circ. ID : HS0028-SEP
Equipment Name/Service : Horizontal Separator
Physical Location :
GPS Coordinates :

VESSEL DESCRIPTION AND SERVICE CONDITIONS

Type of Vessel: Horizontal Separator

Vessel Size: 50" I.D. x 14' 0" S / S

Operating Pressure Range (psig):

Operating Temperature Range (°F):

Does the vessel have Internal Access?: Yes

Specify type of internal access, if available: 18" Manway

Vessel is located: Inside; Inside portable Skid Unit AHS006

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

		NB 11			
W RT4 HT		Manufactured and Certified by		Process Systems Inc. Nisku, AB, Canada	
SERIAL NUMBER	1185	MAWP INTERNAL	2000 PSI @ 200 °F		
YEAR	2005	MDMT	-40 °F @ 2000 PSI		
DESCRIPTION	HORIZ. SEPARATOR		MAWP EXTERNAL	— PSI @ — °F	
SHELL MATERIAL	SA 516-70N	VOL.	217.5 Ft ³		
HEAD MATERIAL	SA 516-70N	THICKNESS	3.00 in.		
CRN	R 9975.2	THICKNESS	2.333 in. min.		
		CA	0.125 in.		
(A) 502 934					

W HT		<i>Manufactured and Certified by</i>  NICODA Process Systems Inc. Nisku, AB, Canada	
SERIAL NUMBER	1185A	MAWP INTERNAL	150 PSI @ 400 °F
YEAR	2005	MDMT	-40 °F @ 150 PSI
DESCRIPTION	STEAM COIL	MAWP EXTERNAL	2000 PSI @ 200 °F
SHELL MATERIAL	SA 106-B	VOL.	0.16 Ft ³
HEAD MATERIAL		THICKNESS	0.436 in.
CRN	R 9975.2	THICKNESS	in. min.
		EXT. CA	00625 in.
		(A)	

SUPPLEMENTAL VESSEL NAMEPLATE/STAMPING INFORMATION

Repair stamp: ☐ R stamp Other Stamp ☐ No stamp

VESSEL DOCUMENTATION

- ☒ Drawings ☒ ASME U-1 or U-1A forms
- ☒ Equipment data sheets ☒ Material/metallurgical reports
- ☒ Welding Procedure Specifications (WPS) ☐ Design calculations
- ☒ Procedure Qualification Records (PQR)
- ☒ Welder Performance Qualifications (WPQ)
- ☒ Records of inspections during fabrication
- ☒ Heat treating records (temperature charts, instrument calibrations, etc.)
- ☒ Hydrotesting records after fabrication (pressure charts, instrument calibrations, etc.)
- ☐ Documentation relating to repair/alteration/rerating work (R-1 form, calculations, revised drawings, inspection reports, etc.). List which of these is available and where it is located.
- ☐ Other pertinent documentation (provide list)

Location of documentation: In data book located in Pure Energy Office – 41 Jamison Drive, Evanston, Wyoming

Name: Robert W. Menke

Date: 5/25/06

API 510 PRESSURE VESSEL EXTERNAL INSPECTION REPORT

Company Name: FMC Technologies Completion	
Field/Location: Grand Junction	
Equipment Number: HS-0028	Eq/Circ. ID: HS0028-SEP
Equipment Name/Service: Horizontal Separator	
Physical Location: Ryans Gulch	
Manufacturer: Micoda Process Systems Inc.	Manufacturer Serial #: 1185
Year Built: 2005	National Board #: 11
Alberta Registration #: 502934	Canadian Registration #: R9975.2

Reason for Inspection: Scheduled API-510 External Inspection

Condition of Nameplate and/or Bracket: The nameplate is not legible. The nameplate bracket is securely attached. Lettering is faded and worn. Stamping is in good condition.

Internal Access?: Yes, Manway

Have Corrosion Monitoring Locations (CMLs) Been Established?: Yes

Grounding Device in Place and Secure?: Yes, the equipment is grounded through the skid. The unit was not in-service during this inspection.

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

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

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

Condition of Nozzles, Flanges, Repads, and Weepholes: Nozzles and flanges are in good condition. All flange bolting is in place and secure.

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. Coating has minor peeling.

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, there are (2) PSV's on this vessel.

If Yes, is it set at or below the MAWP?: Yes, one is set at 2000 psi and the other is set at 2160 psi.

Date PSV last tested (if there is a tag on the valve): 10/2015

Comments:

Recommendations:

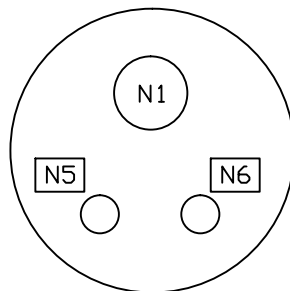
Repairs Needed:

Robert W. Menke/JWW
API 510 Inspector Signature

0131
API 510 Inspector Number

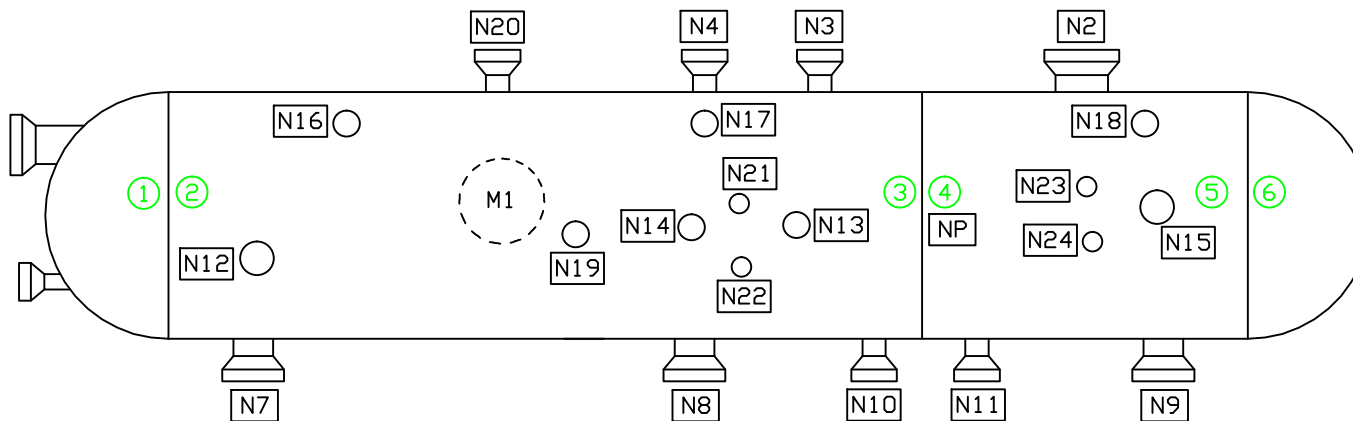
02/16/2016
Date

EQUIP RETIREMENT DATE: 7/4/2024
NEXT INSPECTION IS DUE: 2/15/2017



LEFT HEAD

#1. 01- LFT HD-F 2.960 TC #3. 01- MID SHELL-F 3.037 TC #5. 01- RGT SHELL-F 3.012 TC
#1. 02- LFT HD-BTM 3.000 TC #3. 02- MID SHELL-BTM 3.050 TC #5. 02- RGT SHELL-BTM 3.017 TC
#1. 03- LFT HD-BK 2.991 TC #3. 03- MID SHELL-BK 3.027 TC #5. 04- RGT SHELL-T 3.035 TC
#1. 04- LFT HD-T 3.019 TC #3. 04- MID SHELL-T 3.037 TC #6. 01- RGT HD-F 2.985 TC
#2. 01- LFT SHELL-F 3.043 TC #4. 01- MID SHELL-F 3.044 TC #6. 02- RGT HD-BTM 2.950 TC
#2. 02- LFT SHELL-BTM 3.042 TC #4. 02- MID SHELL-BTM 3.040 TC #6. 03- RGT HD-BK 2.958 TC
#2. 03- LFT SHELL-BK 3.004 TC #4. 03- MID SHELL-BK 3.032 TC #6. 04- RGT HD-T 2.972 TC
#2. 04- LFT SHELL-T 3.055 TC #4. 04- MID SHELL-T 3.049 TC



#101. 01- N-1 INLET-TOP 2.440 TC
#101. 02- N-1 INLET-LEFT 2.448 TC
#101. 03- N-1 INLET-BTM 2.451 TC
#101. 04- N-1 INLET-RIGHT 2.468 TC
#102. 01- N-2 OUTLET-FRONT 2.494 TC
#102. 02- N-2 OUTLET-LEFT 2.482 TC
#102. 03- N-2 OUTLET-BACK 2.463 TC
#102. 04- N-2 OUTLET-RIGHT 2.477 TC
#103. 01- N-3 PSV-1-FRONT 0.000 NT
#103. 03- N-3 PSV-1-BACK 0.000 NT
#104. 01- N-4 PSV-2-FRONT 0.340 TC
#104. 03- N-4 PSV-2-BACK 0.347 TC
#105. 01- N-5STMCDIL-BK-T 0.463 TC
#105. 03- N-5STMCDIL-BK-B 0.438 TC
#106. 01- N-6STMCDIL-F-TOP 0.430 TC
#106. 03- N-6STMCDIL-F-BTM 0.410 TC
#107. 01- N-7SLDSDRAIN-FR 1.781 TC
#107. 02- N-7SLDSDRAIN-LEF 1.773 TC
#107. 03- N-7SLDSDRAIN-BK 1.786 TC
#107. 04- N-7SLDSDRAIN-R 1.787 TC
#108. 01- N-8 H2ODRAIN-FR 1.603 TC
#108. 02- N-8 H2ODRAIN-LEF 1.773 TC
#108. 03- N-8 H2ODRAIN-BK 1.548 TC
#108. 04- N-8 H2ODRAIN-RGT 1.787 TC

#110. 02- N-10 H2O OUT-FR 0.278 TC
#110. 03- N-10 H2O OUT-BK 0.295 TC
#111. 02- N-11 DILDR-LEFT 0.328 TC
#111. 03- N-11 DILDR-R 0.334 TC
#112. 01- N-12-SPARGE-TOP 0.325 TC
#112. 03- N-12-SPARGE-BTM 0.330 TC
#113. 01- N-13-SPARGE-T 0.323 TC
#113. 03- N-13-SPARGE-BTM 0.311 TC
#114. 01- N-14-WATERLC-TOP 1.576 TC
#114. 02- N-14-WATER LC-L 1.573 TC
#114. 03- N-14-WATERLC-BT 1.569 TC
#114. 04- N-14-WATER LC-R 1.573 TC
#115. 01- N-15-DIL-LC-TOP 1.572 TC
#115. 02- N-15-DIL-LC-L 1.560 TC
#115. 03- N-15-DIL-LC-BTM 1.555 TC
#115. 04- N-15-DIL-LC-R 1.565 TC
#116. 01- N-16-CLEANING-F 2.092 TC
#116. 02- N-16-CLEANING-L 2.089 TC
#116. 03- N-16-CLEANING-B 2.092 TC
#116. 04- N-16-CLEANING-R 2.090 TC
#117. 01- N-17-CLEANING-F 2.087 TC
#117. 02- N-17-CLEANING-L 2.086 TC
#117. 03- N-17-CLEANING-B 2.089 TC

#117. 04- N-17-CLEANING-R 2.083 TC
#118. 01- N-18-CLEANING-F 2.078 TC
#118. 02- N-18-CLEANING-L 2.076 TC
#118. 03- N-18-CLEANING-B 2.077 TC
#118. 04- N-18-CLEANING-R 2.075 TC
#119. 01- N-19 TI-TOP 0.337 TC
#119. 03- N-19 TI-BTM 0.303 TC
#120. 01- N-20 PI-FRONT 0.331 TC
#120. 03- N-20 PI-BACK 0.325 TC
#121. 01- N-21-WATERLG-TOP 0.338 TC
#121. 03- N-21-WATERLG-BTM 0.324 TC
#122. 01- N-22-WATERLG-TOP 0.341 TC
#122. 03- N-22-WATERLG-BTM 0.336 TC
#123. 01- N-23-DIL- LG-TOP 0.325 TC
#123. 03- N-23-DIL- LG-BTM 0.343 TC
#124. 01- N-24-DIL- LG-TOP 0.337 TC
#124. 03- N-24-DIL- LG-BTM 0.335 TC
#125. 01- MW-1-FR 3.022 TC
#125. 02- MW-1-LEFT 3.020 TC
#125. 03- MW-1-BK 3.020 TC
#125. 04- MW-1-RIGHT 3.024 TC

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

TC-560

NAMEPLATE INFO	
MFG	MICODA PROCESS SYSTEMS
SERIAL NUMBER	1185
NATIONAL BOARD #	11
DATE BUILT	2005
DESIGN P & T	2000 psi @ 200°F
NOTE	CRN # R9975.2 ALBERTA REG # 502934

CAL BLK= 51°F VESSEL= 39°F

BUSINESS UNIT	FMC TECHNOLOGIES COMPLETION
EQ/CIRC ID #	HS0028-SEP
EQUIP NAME	SEPARATOR
LOCATION	INSIDE SKID UNIT HS-0028
DWG #	HS0028-SEP

DESC: HORIZONTAL SEPARATOR-SN-1185
DWG#: HS0028-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: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HS0028-SEP
 Eq Type: VESSEL
 Class:
 CM RBL:
 Design Code: S8/D1

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

Description: HORIZONTAL SEPARATOR; SN: 1185

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 01/04/2024

Group Description:
 RCR = 7.2 MPY
 Rem. Life (from last survey 02/16/2016) = 8.4 yrs

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

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
1.01	LFT HD-F	N	2.956	04/05/2006	2.954 TC	01/25/2015	2.954 RR	02/16/2016	0	0.2	0.2	4.4	2.525 P	0.2	03/02/4016	02/15/2017
1.02	LFT HD-BTM	N	2.994	04/05/2006	2.930 TC	01/25/2015	2.930 RR	02/16/2016	0	6.5	7.8	54.6	2.525 P	6.5	06/08/2078	02/15/2017
1.03	LFT HD-BK	N	2.985	04/05/2006	2.977 RR	01/25/2015	2.987 RR	02/16/2016	0	0	0.5	10.9	2.525 P	0.1	03/02/4016	02/15/2017
1.04	LFT HD-T	N	3.013	04/05/2006	2.992 TC	01/25/2015	2.992 RR	02/16/2016	0	2.1	2.4	16.4	2.525 P	2.1	07/07/2238	02/15/2017
2.01	LFT SHELL-F	N	3.037	04/05/2006	3.025 TC	01/25/2015	3.025 RR	02/16/2016	0	1.2	1.2	12.0	2.660 P	1.2	08/27/2320	02/15/2017
2.02	LFT SHELL-BTM	N	3.036	04/05/2006	3.030 TC	01/25/2015	3.030 RR	02/16/2016	0	0.6	0.9	14.7	2.660 P	0.6	10/21/2632	02/15/2017
2.03	LFT SHELL-BK	Y	3.044 RP	07/18/2012	3.029 TC	01/25/2015	3.004 TC	02/16/2016	23.6	11.2	9.7	23.6	2.660 P	23.6	09/14/2030	02/15/2017
2.04	LFT SHELL-T	N	3.046	04/05/2006	3.052 TC	01/25/2015	3.052 RR	02/16/2016	0	0	0	3.3	2.660 P	0.1	03/02/4016	02/15/2017
3.01	MID SHELL-F	N	3.032	04/05/2006	3.029 RR	01/25/2015	3.032 RR	02/16/2016	0	0	0.2	6.1	2.660 P	0.1	03/02/4016	02/15/2017
3.02	MID SHELL-BTM	N	3.024	04/05/2006	3.013 RR	01/25/2015	3.016 RR	02/16/2016	0	0.8	1.2	8.7	2.660 P	0.8	02/18/2461	02/15/2017
3.03	MID SHELL-BK	N	3.043	04/05/2006	3.034 RR	01/25/2015	3.027 TC	02/16/2016	6.6	1.6	1.4	10.9	2.660 P	6.6	09/25/2071	02/15/2017
3.04	MID SHELL-T	N	3.052	04/05/2006	3.023 TC	01/25/2015	3.023 RR	02/16/2016	0	2.9	3.3	20.7	2.660 P	2.9	04/20/2141	02/15/2017
4.01	MID SHELL-F	N	3.037	04/05/2006	3.035 TC	01/25/2015	3.035 RR	02/16/2016	0	0.2	0.3	6.1	2.660 P	0.2	03/02/3891	02/15/2017
4.02	MID SHELL-BTM	N	3.039	04/05/2006	3.032 TC	01/25/2015	3.032 RR	02/16/2016	0	0.7	0.9	1.7	2.660 P	0.7	07/26/2547	02/15/2017
4.03	MID SHELL-BK	N	3.028	04/05/2006	3.029 RR	01/25/2015	3.031 RR	02/16/2016	0	0	0	6.1	2.660 P	0.1	03/02/4016	02/15/2017
4.04	MID SHELL-T	N	3.044	04/05/2006	3.034 TC	01/25/2015	3.034 RR	02/16/2016	0	1.0	1.3	10.9	2.660 P	1.0	02/18/2390	02/15/2017
5.01	RGT SHELL-F	N	3.009	04/05/2006	3.000 RR	01/25/2015	3.007 RR	02/16/2016	0	0.2	0.7	1.9	2.660 P	0.2	03/01/3751	02/15/2017
5.02	RGT SHELL-BTM	N	3.015	04/05/2006	2.999 RR	01/25/2015	3.002 RR	02/16/2016	0	1.3	2.5	21.8	2.660 P	1.3	03/18/2279	02/15/2017
5.04	RGT SHELL-T	N	3.029	04/05/2006	3.026 RR	01/25/2015	3.028 RR	02/16/2016	0	0.1	0.1	8.1	2.660 P	0.1	03/02/4016	02/15/2017
6.01	RGT HD-F	N	2.982	04/05/2006	2.978 RR	01/25/2015	2.981 RR	02/16/2016	0	0.1	0	1.0	2.525 P	0.1	03/02/4016	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date:06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HS0028-SEP
 Eq Type: VESSEL
 Class:
 CM RBL:
 Design Code: S8/D1

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

Description: HORIZONTAL SEPARATOR; SN: 1185

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 7.2 MPY
 Pred. Ret. Date = 07/04/2024 Rem. Life (from last survey 02/16/2016) = 8.4 yrs

Ø C.A. Status: No
 Total Caution IMLS = 1

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
6.02	RGT HD-BTM	N	2.943	04/05/2006	2.946 TC	01/25/2015	2.946 RR	02/16/2016	0	0	0	4.1	2.525 P	0.1	03/02/4016	02/15/2017
6.03	RGT HD-BK	N	2.955	04/05/2006	2.953 RR	01/25/2015	2.954 RR	02/16/2016	0	0.1	0	3.3	2.525 P	0.1	03/02/4016	02/15/2017
6.04	RGT HD-T	N	2.968	04/05/2006	2.966 RR	01/25/2015	2.967 RR	02/16/2016	0	0.1	0	1.4	2.525 P	0.1	03/02/4016	02/15/2017
101.01	N-1 INLET-TOP	N	2.465	04/05/2006	2.436 TC	01/25/2015	2.436 RR	02/16/2016	0	2.9	3.6	8.1	2.340 U	2.9	03/25/2049	02/15/2017
101.02	N-1 INLET-LEFT	N	2.472	04/05/2006	2.436 RR	01/25/2015	2.437 RR	02/16/2016	0	3.5	4.4	50.4	2.340 U	3.5	11/04/2043	02/15/2017
101.03	N-1 INLET-BTM	N	2.473	04/05/2006	2.450 TC	01/25/2015	2.450 RR	02/16/2016	0	2.3	2.7	6.8	2.340 U	2.3	12/14/2063	02/15/2017
101.04	N-1 INLET-RIGHT	N	2.466	04/05/2006	2.455 TC	01/25/2015	2.455 RR	02/16/2016	0	1.1	0.7	6.9	2.340 U	1.1	09/03/2120	02/15/2017
102.01	N-2 OUTLET-FRONT	N	2.495	04/05/2006	2.481 TC	01/25/2015	2.481 RR	02/16/2016	0	1.4	1.3	10.2	2.340 U	1.4	11/04/2116	02/15/2017
102.02	N-2 OUTLET-LEFT	N	2.484	04/05/2006	2.461 TC	01/25/2015	2.461 RR	02/16/2016	0	2.3	2.7	19.6	2.340 U	2.3	09/25/2068	02/15/2017
102.03	N-2 OUTLET-BACK	N	2.465	04/05/2006	2.461 TC	01/25/2015	2.461 RR	02/16/2016	0	0.4	0.4	449.7	2.340 U	0.4	08/20/2318	02/15/2017
102.04	N-2 OUTLET-RIGHT	N	2.476	04/05/2006	2.465 RR	01/25/2015	2.470 RR	02/16/2016	0	0.6	0.8	4.1	2.340 U	0.6	10/19/2232	02/15/2017
103.01	N-3 PSV-1-FRONT	N	0.357	04/05/2006	0.301 TC	06/25/2014	0.298 TC	01/25/2015	5.1	6.7	8.3	26.5	0.219 U	6.7	11/10/2026	01/25/2016
103.03	N-3 PSV-1-BACK	N	0.359	04/05/2006	0.299 TC	06/25/2014	0.299 RR	01/25/2015	0	6.8	8.5	19.3	0.219 U	6.8	10/31/2026	01/25/2016
104.01	N-4 PSV-2-FRONT	N	0.359	04/05/2006	0.330 TC	01/25/2015	0.330 RR	02/16/2016	0	2.9	3.1	38.3	0.219 U	2.9	05/27/2054	02/15/2017
104.03	N-4 PSV-2-BACK	N	0.363	04/05/2006	0.293 RR	01/25/2015	0.331 RR	02/16/2016	0	3.2	5.9	19.3	0.219 U	3.2	02/16/2051	02/15/2017
105.01	N-5STMCOIL-BK-T	N	0.430	04/05/2006	0.436 RR	01/25/2015	0.439 RR	02/16/2016	0	0	0	10.9	0.311 U	0.1	02/25/3296	02/15/2017
105.03	N-5STMCOIL-BK-B	N	0.427	04/05/2006	0.434 TC	01/25/2015	0.434 RR	02/16/2016	0	0	0	18.7	0.311 U	0.1	02/25/3246	02/15/2017
106.01	N-6STMCOIL-F-TOP	N	0.461	04/05/2006	0.403 TC	01/25/2015	0.403 RR	02/16/2016	0	5.9	6.6	20.5	0.311 U	5.9	09/20/2031	02/15/2017
106.03	N-6STMCOIL-F-BTM	N *	0.455	04/05/2006	0.421 TC	01/25/2015	0.410 TC	02/16/2016	10.4	4.6	3.1	10.4	0.311 U	10.4	08/24/2025	02/15/2017
107.01	N-7SLSDRAIN-FR	N	1.788 TC	07/18/2012	1.780 TC	01/25/2015	1.780 RR	02/16/2016	0	2.2	2.4	39.3	1.680 U	2.2	07/31/2061	02/15/2017
107.02	N-7SLSDRAIN-LEF	N *	1.826	04/05/2006	1.746 TC	01/25/2015	1.746 RR	02/16/2016	0	8.1	9.2	200.3	1.680 U	8.1	04/10/2024	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date:06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HS0028-SEP
 Eq Type: VESSEL
 Class:
 CM RBL:
 Design Code: S8/D1

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

Description: HORIZONTAL SEPARATOR; SN: 1185

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 7.2 MPY
 Pred. Ret. Date = 07/04/2024 Rem. Life (from last survey 02/16/2016) = 8.4 yrs

Ø C.A. Status: No
 Total Caution IMLS = 1

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
107.03	N-7SLDSDRAIN-BK	N	1.805 NM	02/10/2005		N/A	1.786 TC	02/16/2016	N/A	1.7	N/A	1.7	1.680 U	1.7	06/24/2078	02/15/2017
107.04	N-7SLDSDRAIN-R	N	1.805 NM	02/10/2005		N/A	1.787 TC	02/16/2016	N/A	1.6	N/A	1.6	1.680 U	1.6	01/01/2083	02/15/2017
108.01	N-8 H20DRAIN-FR	N	1.580 NM	02/10/2005		N/A	1.603 TC	02/16/2016	N/A	0	N/A	0	1.455 U	0.1	02/27/3496	02/15/2017
108.02	N-8 H20DRAIN-LEF	N	1.580 NM	02/10/2005		N/A	1.773 TC	02/16/2016	N/A	0	N/A	0	1.455 U	0.1	03/02/4016	02/15/2017
108.03	N-8 H20DRAIN-BK	N	1.574	04/05/2006	1.540 RR	01/25/2015	1.544 RR	02/16/2016	0	3.0	2.3	12.6	1.455 U	3.0	10/17/2045	02/15/2017
108.04	N-8 H20DRAIN-RGT	N *	1.618	04/05/2006	1.536 TC	01/25/2015	1.536 RR	02/16/2016	0	8.3	9.8	1227.3	1.455 U	8.3	11/19/2025	02/15/2017
110.02	N-10 H20 OUT-FR	N *	0.344 NM	02/10/2005		N/A	0.278 TC	02/16/2016	N/A	6.0	N/A	6.0	0.219 U	6.0	12/17/2025	02/15/2017
110.03	N-10 H20 OUT-BK	N *	0.358	04/05/2006	0.279 RR	01/25/2015	0.280 RR	02/16/2016	0	7.9	9.6	16.8	0.219 U	7.9	11/06/2023	02/15/2017
111.02	N-11-OILDR-LEFT	N	0.344 NM	02/10/2005		N/A	0.328 TC	02/16/2016	N/A	1.5	N/A	1.5	0.219 U	1.5	10/17/2088	02/15/2017
111.03	N-11-OILDR-R	N	0.382	04/05/2006	0.308 TC	01/25/2015	0.308 RR	02/16/2016	0	7.5	9.0	18.3	0.219 U	7.5	12/29/2027	02/15/2017
112.01	N-12-SPARGE-TOP	N	0.375	04/05/2006	0.309 TC	01/25/2015	0.309 RR	02/16/2016	0	6.7	7.5	12.0	0.219 U	6.7	07/23/2029	02/15/2017
112.03	N-12-SPARGE-BTM	N	0.337	04/05/2006	0.297 RR	01/25/2015	0.298 RR	02/16/2016	0	4.0	5.1	35.7	0.219 U	4.0	11/17/2035	02/15/2017
113.01	N13-SPARGE-T	N	0.344 NM	02/10/2005		N/A	0.323 TC	02/16/2016	N/A	1.9	N/A	1.9	0.219 U	1.9	11/12/2070	02/15/2017
113.03	N13-SPARGE-BTM	N	0.344 NM	02/10/2005		N/A	0.311 TC	02/16/2016	N/A	3.0	N/A	3.0	0.219 U	3.0	10/17/2046	02/15/2017
114.01	N-14-WATERLC-TOP	N	1.610	04/05/2006	1.558 TC	01/25/2015	1.558 RR	02/16/2016	0	5.3	5.3	15.4	1.455 U	5.3	07/24/2035	02/15/2017
114.02	N-14-WATER LC-L	N	1.592	04/05/2006	1.559 TC	01/25/2015	1.559 RR	02/16/2016	0	3.3	3.8	13.7	1.455 U	3.3	08/23/2047	02/15/2017
114.03	N-14-WATERLC-BT	N	1.580 NM	02/10/2005		N/A	1.569 TC	02/16/2016	N/A	1.0	N/A	1.0	1.455 U	1.0	02/16/2130	02/15/2017
114.04	N-14-WATER LC-R	N	1.589	04/05/2006	1.560 TC	01/25/2015	1.560 RR	02/16/2016	0	2.9	3.3	8.1	1.455 U	2.9	05/02/2052	02/15/2017
115.01	N-15-OIL-LC-TOP	N	1.596	04/05/2006	1.569 TC	01/25/2015	1.569 RR	02/16/2016	0	2.7	3.2	7.4	1.455 U	2.7	05/08/2058	02/15/2017
115.02	N-15-OIL-LC-L	N	1.587	04/05/2006	1.552 TC	01/25/2015	1.552 RR	02/16/2016	0	3.5	3.5	7.9	1.455 U	3.5	11/04/2043	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HS0028-SEP
 Eq Type: VESSEL
 Class:
 CM RBL:
 Design Code: S8/D1

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

Description: HORIZONTAL SEPARATOR; SN: 1185

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 7.2 MPY
 Pred. Ret. Date = 07/04/2024 Rem. Life (from last survey 02/16/2016) = 8.4 yrs

Ø C.A. Status: No
 Total Caution IMLS = 1

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
115.03	N-15-OIL-LC-BTM	N	1.565	04/05/2006	1.545 TC	01/25/2015	1.545 RR	02/16/2016	0	2.0	2.0	16.8	1.455 U	2.0	02/15/2061	02/15/2017
115.04	N-15-OIL-LC-R	N	1.591	04/05/2006	1.548 TC	01/25/2015	1.548 RR	02/16/2016	0	4.4	5.4	7.9	1.455 U	4.4	04/06/2037	02/15/2017
116.01	N-16-CLEANING-F	N	2.086	04/05/2006	2.080 RR	01/25/2015	2.083 RR	02/16/2016	0	0.3	0.7	8.4	1.905 U	0.3	06/22/2609	02/15/2017
116.02	N-16-CLEANING-L	N	2.086	04/05/2006	2.084 TC	01/25/2015	2.084 RR	02/16/2016	0	0.2	0.2	2.0	1.905 U	0.2	02/23/2911	02/15/2017
116.03	N-16-CLEANING-B	N	2.088	04/05/2006	2.080 TC	01/25/2015	2.080 RR	02/16/2016	0	0.8	0.4	13.7	1.905 U	0.8	11/18/2234	02/15/2017
116.04	N-16-CLEANING-R	N	2.086	04/05/2006	2.086 TC	01/25/2015	2.086 RR	02/16/2016	0	0	0	3.3	1.905 U	0.1	03/01/3826	02/15/2017
117.01	N-17-CLEANING-F	N	2.089	04/05/2006	2.084 RR	01/25/2015	2.087 TC	02/16/2016	0	0.2	0.3	3.1	1.905 U	0.2	02/23/2926	02/15/2017
117.02	N-17-CLEANING-L	N	2.087	04/05/2006	2.076 RR	01/25/2015	2.079 RR	02/16/2016	0	0.8	0.8	3.9	1.905 U	0.8	08/19/2233	02/15/2017
117.03	N-17-CLEANING-B	N	2.088	04/05/2006	2.077 TC	01/25/2015	2.077 RR	02/16/2016	0	1.1	1.2	6.1	1.905 U	1.1	06/29/2172	02/15/2017
117.04	N-17-CLEANING-R	N	2.088	04/05/2006	2.074 TC	01/25/2015	2.074 RR	02/16/2016	0	1.4	1.6	3.4	1.905 U	1.4	11/04/2136	02/15/2017
118.01	N-18-CLEANING-F	N	2.073	04/05/2006	2.062 TC	01/25/2015	2.062 RR	02/16/2016	0	1.1	1.1	15.4	1.905 U	1.1	11/09/2158	02/15/2017
118.02	N-18-CLEANING-L	N	2.075	04/05/2006	2.068 TC	01/25/2015	2.068 RR	02/16/2016	0	0.7	0.7	8.4	1.905 U	0.7	12/27/2248	02/15/2017
118.03	N-18-CLEANING-B	N	2.075	04/05/2006	2.065 TC	01/25/2015	2.065 RR	02/16/2016	0	1.0	1.0	8.5	1.905 U	1.0	02/17/2176	02/15/2017
118.04	N-18-CLEANING-R	N	2.075	04/05/2006	2.076 TC	01/25/2015	2.075 TC	02/16/2016	0.9	0	0.1	6.1	1.905 U	0.9	01/08/2205	02/15/2017
119.01	N-19 TI-TOP	N	0.359	04/05/2006	0.331 TC	01/25/2015	0.331 RR	02/16/2016	0	2.8	4.3	27.3	0.233 U	2.8	02/16/2051	02/15/2017
119.03	N-19 TI-BTM	N *	0.337	04/05/2006	0.317 TC	01/25/2015	0.303 TC	02/16/2016	13.2	3.4	2.8	13.2	0.233 U	13.2	06/06/2021	02/15/2017
120.01	N-20 PI-FRONT	N	0.351	04/05/2006	0.323 RR	01/25/2015	0.329 RR	02/16/2016	0	2.2	3.3	12.0	0.233 U	2.2	10/06/2059	02/15/2017
120.03	N-20 PI-BACK	N	0.341	04/05/2006	0.323 RR	01/25/2015	0.325 TC	02/16/2016	0	1.6	2.4	6.3	0.233 U	1.6	08/17/2073	02/15/2017
121.01	N-21-WATERLG-TOP	N	0.375	04/05/2006	0.336 TC	01/25/2015	0.336 RR	02/16/2016	0	4.0	4.8	7.5	0.233 U	4.0	11/16/2041	02/15/2017
121.03	N-21-WATERLG-BTM	N	0.336	04/05/2006	0.327 TC	01/25/2015	0.324 TC	02/16/2016	2.8	1.2	1.2	3.3	0.233 U	2.8	08/17/2048	02/15/2017
122.01	N-22-WATERLG-TOP	N	0.388	04/05/2006	0.342 TC	01/25/2015	0.341 TC	02/16/2016	0.9	4.8	4.9	11.9	0.233 U	4.8	08/17/2038	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HS0028-SEP
 Eq Type: VESSEL
 Class:
 CM RBL:
 Design Code: S8/D1

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

Description: HORIZONTAL SEPARATOR; SN: 1185

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 7.2 MPY
 Pred. Ret. Date = 07/04/2024 Rem. Life (from last survey 02/16/2016) = 8.4 yrs

Ø C.A. Status: No
 Total Caution IMLS = 1

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
122.03	N-22-WATERLG-BTM	N	0.346	04/05/2006	0.320 TC	01/25/2015	0.320 RR	02/16/2016	0	2.6	2.8	8.5	0.233 U	2.6	08/03/2049	02/15/2017
123.01	N-23-OIL- LG-TOP	N	0.355	04/05/2006	0.330 TC	01/25/2015	0.325 TC	02/16/2016	4.7	3.0	2.7	6.6	0.233 U	4.7	09/14/2035	02/15/2017
123.03	N-23-OIL- LG-BTM	N	0.351	04/05/2006	0.329 TC	01/25/2015	0.329 RR	02/16/2016	0	2.2	2.3	8.7	0.233 U	2.2	10/06/2059	02/15/2017
124.01	N-24-OIL- LG-TOP	N	0.353	04/05/2006	0.328 RR	01/25/2015	0.330 RR	02/16/2016	0	2.3	2.8	7.0	0.233 U	2.3	04/20/2058	02/15/2017
124.03	N-24-OIL- LG-BTM	N	0.356	04/05/2006	0.322 TC	01/25/2015	0.322 RR	02/16/2016	0	3.4	3.6	9.8	0.233 U	3.4	04/21/2042	02/15/2017
125.01	MW-1-FR	N	3.030 NM	02/10/2005		N/A	3.022 TC	02/16/2016	N/A	0.7	N/A	0.7	2.905 U	0.7	04/10/2183	02/15/2017
125.02	MW-1-LEFT	N	3.026	04/05/2006	3.015 TC	01/25/2015	3.015 RR	02/16/2016	0	1.1	1.2	2.1	2.905 U	1.1	02/17/2116	02/15/2017
125.03	MW-1-BK	N	3.030 NM	02/10/2005		N/A	3.020 TC	02/16/2016	N/A	0.9	N/A	0.9	2.905 U	0.9	11/28/2143	02/15/2017
125.04	MW-1-RIGHT	N	3.029	04/05/2006	3.013 TC	01/25/2015	3.013 RR	02/16/2016	0	1.6	1.3	8.5	2.905 U	1.6	08/17/2083	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HS0028-SEP
 Design Code: S8/D1
 Eq Type: VESSEL
 Class:
 CM RBI:

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

Description: HORIZONTAL SEPARATOR; SN: 1185

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	:	2.7 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	7.2 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	3.1 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 7.2 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 = 8.4 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 07/04/2024

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
 UT/RT Inspection Interval is 1.00 years.

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

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 502934

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-1K4
 (Name and address of Purchaser)

3. Location of installation Portable
 (Name and address)

4. Type: Horizontal Separator 1185 R 9975.2 IV 44 Rev 4 11 2005
 (Honz., vert., or sphere) (Tank, separator, jkt. vessel, heat exh., etc.) (Mfg's serial No.) (CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

5. ASME Code, Section VIII, Div. 1 2001 Edition, 2003 Addenda 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

(Metric Spec. Noted, 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	2.883"	0.125"	N/A	N/A	2:1 SE	N/A	N/A	N/A	No	Yes	1	Full		1
(b)	END	2.888"	0.125"	N/A	N/A	2:1 SE	N/A	N/A	N/A	No	Yes	1	Full		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

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

10. Impact test - (Indicate yes or no and the component(s) impact tested) at test temperature of - °F

11. Hydro., pneum., or other 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" 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	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: (s)

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

(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp															
	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A			
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full	Spot	None
(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.)

④502934

16 MAWP 150 2000 psi at max temp 400 250 °F Min design metal temp -40 °F at 150 psi
(internal) (external) (internal) (external)

17 Impact test No: Per UCS-66(c) 68(C) 2/25/05 at test temperature of - °F
(Indicate yes or no and the component(s) impact tested)

18 Hydro ~~pressure~~ test press 195 Proof test N/A

19. Nozzles, inspection, and safety valve openings

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Inso. Open.)
				Nozzle	Flange	Nom	Corr		Nozzle	Flange	
-	-	-	-	See Attached	U-4 Form	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

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

21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:

(List the name of part, item number, mfg's name and identifying number)

Vessel Fabricated by Complete Package Technology (2000) Ltd. S/N C-04-7090

22. Remarks: Construction dwg. 04-475-V Rev. 3

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

Volume: 217.5 cu./ft.

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

CERTIFICATE OF SHOP COMPLIANCE

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

U Certificate of Authorization No. 32693 Expires 1/10/2007

Date 2/25/2005 Name MICODA PROCESS SYSTEMS INC. Signed [Signature]
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of Alberta and employed by ABSA of Alberta have inspected the pressure vessel described in this Manufacturer's Data Report on 2/25/2005 and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 2/25/2005 Signed [Signature] Commissions NB 1227 'A' 'B' NB 1328
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements on this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME Code, Section VIII, Division 1.

U Certificate of Authorization No. Expires

Date Name Signed
(Assembler) (Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of and employed by of have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items , not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with ASME Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of psi. By signing this certificate neither the inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date Signed Commissions
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)

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

4502934

- Manufactured and certified by COMPLETE PACKAGE TECHNOLOGY (2000) LTD., 2887 PARSONS ROAD, EDMONTON, AB T6N 1A3
(Name and address of Manufacturer)
- Manufactured for MICODA PROCESS SYSTEMS INC., 1211 - 8A STREET NISKU, ALBERTA
(Name and address of Purchaser)
- Location of installation MICODA PROCESS SYSTEMS INC., 1211 - 8A STREET NISKU, ALBERTA
(Name and address)
- Type: Horizontal C04-7090 R9975.2
(Description of vessel part (shell, two-piece head, tube bundle)) (Mfg's serial No.) (CRN)
N/A 04-475-V R1 Micoda Process 2005
(Nat'l. Bd. No.) (Drawing No.) (Drawing prepared by) (Year built)
- ASME Code, Section VIII, Div. 1 2001 Ed. J1.1, 2003 N/A N/A
(Edition and Addenda (Date)) (Code Case No.) (Special Service per UG-120(d))
- Shell (a) No. of course(s): 2 (b) Overall length (ft & in.): 14" 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	4'	SA-516-70MT	3"	----	1	Full	1.0	1	Full	1	1150	2 1/2 hrs
1	60"ID	10'	SA-516-70MT	3"	----	1	Full	1.0	1	Full	1	1150	2 1/2 hrs
7. Heads: (a) SA-516-70MT 1150, 2 1/2 hrs (b) _____													

7. Heads: (a) SA-516-70MT 1150 - 2 1/2 hrs (b) SA-516-70MT 1150 - 2 1/2 hrs
(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)	Left side	2.88"	.125	----	----	----	----	2:1 SE	----	----	concave	N/A	N/A	----
(b)	Right side	2.88"	.125	----	----	----	----	2:1 SE	----	----	concave	N/A	N/A	----

If removable, bolts used (describe other fastening)

8. MAWP 2000 ----- psi at max. temp. 200 ----- °F. Min. design metal temp. -40 °F at 2000 psi.
(Internal) (external) (Internal) (External)

9. Impact test Production impact test shell and heads at test temperature of -50 °F.
(Indicate yes or no and the component(s) impact tested)

10. Hydro., pneu., or comb. test press. By others Proof test

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	

12. Supports: Skirt No No Legs No Others 2 saddles Attached Welded to shell
(Yes or no) (No.) (No.) (Describe) (Where and how)

13. Remarks: Partial data reports for shells, Edmonton Exchanger & Refinery Services Ltd. S/N: S53083-14-2 & S53083-16-2
Partial data reports for closures, In-line Flow Products Limited S/N: 08397, 08395 & 08394

Nozzles & flanges impact test exempt per UCS 86(g) see attached U-4 No Engineering or design by Complete Package Technology (2000) Ltd.

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. 32,148 Expires October 17, 2006

Date Feb 10, 2005 Name Complete Package Technology (2000) Ltd. Signed [Signature]
(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 ALBERTA BOILERS SAFETY ASSOCIATION of ALBERTA

have inspected the pressure vessel part described in this Manufacturer's Data Report on Feb 10, 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 Feb 10, 2005 Signed [Signature] Commissions AA 4287
(Authorized Inspector) (National Board Incl. Endorsement, State, Province and No.)

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

④502934

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 exch., 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 [Signature]
(Authorized Inspector)

Expires: 17-Oct-06

Signed

Commission ALBERTA #87
(Nat'l Board (incl. Endorsements) State, Province and No.)

CORRECTED COPY 12/14/2004

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

④ 502934

1. Manufactured and certified by EDMONTON EXCHANGER & REFINERY SERVICES LTD. 5545 - 89 STREET EDMONTON, AB T6E 5W9
(Name and address of Manufacturer)
2. Manufactured for MICODA PROCESS SYSTEMS 1211 - 8A STREET NISKU, AB
(Name and address of Purchaser)
3. Location of installation N/A
(Name and address)
4. Type: 2 - TWO PIECE WELDED SHELLS 553083-14-1/-2 N/A
(Description of vessel part (shell, two-piece head, tube bundle) (Mfg's serial No.) (CRN)
N/A N/A N/A SEPTEMBER 2004
(Natl. Bd. No.) (Drawing No.) (Drawing prepared by) (Year built)
5. ASME Code, Section VIII, Div. 1 2001 EDITION JULY 1, 2003 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 - TWO PIECE WELDED SHELLS (b) Overall length, ft. & in.: 10'-0" EACH

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
2	50"ID	10'-0"	SA-516-70MT	3.00"	----	1	FULL	1.0	----	----	----	BY OTHERS	

7. Head(s) (a): N/A (b): N/A
(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	First Diameter	Side to Pressure		Category A		
	Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)													
(b)													

If removable, bolts used (describe other fastening)

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

8. Type of jacket -N/A- Jacket closure -N/A-
(Describe as open, & weld, bar, etc.)

If bar, give dimensions -N/A- If bolted, describe or sketch.

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

10. Impact test YES - PRODUCTION COUPON (WP-114) NORMALIZED PLATE; PWHT @ 1150°F FOR 150 MINUTES AS PER UCS-56. CHARPY IMPACT TESTED @ -50°F AS PER UG-84. at test temperature of -50°F °F.
(Indicate yes or no and the component(s) tested)

11. Hydro., pneu. or comb. test pressure -N/A- Proof Test -N/A-

Items 12 and 13 to be completed for tube sections.

-N/A-

12. Tubesheet: -N/A-
(Stationary (Mat'l Spec. No.)) (Dis. in. (subject to press.)) (Nom. thk., in.) (Corr. Allow., in.) (Attachment (welded or bolted))
(Floating (Mat'l Spec. No.)) (Dis. in.) (Nom. thk., in.) (Corr. Allow., in.) (Attachment)

13. Tubes: -N/A-
(Mat'l Spec. No., Grade or Type) (O.D., in.) (Nom. thk., in. or gauge) (Number) (Type (Straight or U))

Items 14-18 inc. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

-N/A-

14. Shell (a) No. of course(s): -N/A- (b) Overall length, ft. & in.: -N/A-

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	ER.	Type	Full, Spot, None	ER.	Temp.	Time

(National Board and endorsement, State, Province and No)

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

CORRECTED COPY 12/14/2004

④ 502934

1. Manufactured and certified by **EDMONTON EXCHANGER & REFINERY SERVICES LTD. 5545 - 89 STREET EDMONTON, AB T6E 5W9**
(Name and address of Manufacturer)
2. Manufactured for **MICODA PROCESS SYSTEMS 1211 - 8A STREET NISKU, AB**
(Name and address of Purchaser)
3. Location of installation **N/A**
(Name and address)
4. Type: **2 - TWO PIECE WELDED SHELLS**
(Description of vessel part (shell, two-piece head, tube bundle)) **S53083-16-1, -2**
(Mfg's serial No.) **N/A**
(CRN)
- N/A** **N/A** **N/A** **SEPTEMBER 2004**
(Mat'l. Bd. No.) (Drawing No.) (Drawing prepared by) (Year built)
5. ASME Code, Section VIII, Div. 1 **2001 EDITION JULY 1, 2003**
(Edition and Addenda (date)) **N/A** **N/A**
(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 - TWO PIECE WELDED SHELLS** (b) Overall length, ft. & in.: **4'-0" EACH**

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
2	50" ID	4'-0"	SA-516-70MT		3.00"	-----	1	FULL	1.0	-----	-----	-----	BY OTHERS	

7. Head(s) (a): **N/A** (b): **N/A**
(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	Stds. to Pressure		Category A		
	Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)													
(b)													

If removable, bolts used (describe other fastening)

-N/A-

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

8. Type of jacket **N/A** Jacket closure **N/A**
(Describe as ogee, & weld, bar, etc.)

If bar, give dimensions

-N/A-

If bolted, describe or sketch.

9. MAWP **N/A** psi at max. temp. **N/A** °F. Min. design metal temp **N/A** °F at **N/A** psi.
(internal) (external) (internal) (external)

YES - PRODUCTION COUPON (WP-114) NORMALIZED PLATE; PWHT @ 1150°F FOR 150 MINUTES AS PER UCS-56. CHARPY IMPACT TESTED @ -50°F AS PER UG-84.

10. Impact test **N/A** at test temperature of **-50°F** °F.
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu. or comb. test pressure **N/A** Proof Test **N/A**

Items 12 and 13 to be completed for tube sections.

-N/A-

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 inc. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

-N/A-

14. Shell (a) No. of course(s): **N/A** (b) Overall length ft. & in.: **N/A**

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

④ 502934

(a).

(b)

(Mat) Spec No. Grade or Type) H T - Time & Temp.)

If removable, bolts used (describe other fastening)

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

(internal)

{EX1074}

psi at max. temp.

(continued)

(總發行所)

°F. Min. design metal temp.

०६

psi.

17. Impact test

(Indicate yes or no and the component(s) impact tested)

18. Hydro., pneu. or comb. test pressure

Proof Test

19. Nozzles, inspection, and safety valve openings:

-N/A-

20. Supports : Skirt

(Yes or no)

Lugs

[No]

Legs

(No. 1)

Others

(Describe)

Attached

(Where and how)

21. Remarks:

NO ENGINEERING, DRAWING OR DESIGN BY EDMONTON EXCHANGER

- FULL RADIOGRAPHY ON LONG SEAM WELDS. TACK WELDS WELDED USING APPROVED WELD PROCEDURE WP-600.
- PWHT ON SHELLS BY OTHERS
- HYDRO BY OTHERS
- SHELL(S) - HOT FORMED @ 1650°F AND AIR COOLED.
- 2 - 3.00" NOM. X 50" ID X 4'-0" TWO PIECE WELDED SHELLS

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. 24597 Expires NOVEMBER 1, 2005

Date Dec. 14/04 Name EDMONTON EXCHANGER & REFINERY SERVICES LTD.
(Manufacturer)

Signed

(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 of Province of ALBERTA and employed by ALBERTA BOILERS SAFETY ASSOCIATION of ALBERTA have inspected the pressure vessel part described in this Manufacturer's Data Report on DEC 14, 2004, 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 Dec 19/01 Signed _____

(Authorized Inspector)

Commissions

AB95A

endorsement State Province and 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

0502934

1. Manufactured and certified by In-Line Flow Products Limited, 14117-70 Avenue, Edmonton, Alberta, Ca (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 4 (Drawing No.)
08382 to 08402 Inclusive (Mfg's serial No.)
In-Line Flow Products Limited (Drawing prepared by)
OH4712.231 (CRN)
2004 (Year built)
N/A (Special Service per UG-120(d))
5. ASME Code, Section VIII, Div. 1 2001 Edition - 2003 Addenda (Edition and Addenda (date))
N/A (Code Case No.)
6. Shell (a) No. of course(s): One (b) Overall length (ft & in.): 0 Feet - 5.00 inches

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	5 187	5.00 in	SA350 Grade LF2		0.969	0.125	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) _____ (Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.)

Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
	Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a) End	0.613	0.125								Yes	N/A	N/A	N/A
(b)													

- If removable, bolts used (describe other fastening) 7.750-2-Modified Stub ACME-2G (Mat'l Spec. No., Grade, Size, No.)
8. MAWP 2220 (Internal) (external) psi at max. temp. 400 (Internal) (external) °F. Min. design metal temp. -50 °F at 2220 psi.
9. Impact test No (See Remarks) (Indicate yes or no and the component(s) impact tested) at test temperature of _____ °F.
10. Hydro., pneu., or comb. test press. N/A Proof test N/A
11. Nozzles, inspection, and safety valve or hangers:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
Outlet - Alert Fitting	1	1/2 NPT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Shell

12. Supports: Skirt No (Yes or no) Lugs N/A (No.) Legs N/A (No.) Others Hinge Assm. Cap Pin (Describe) Attached Welded (WPS Inline-1) (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 4 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 Oct 14, 2004 Name In-Line Flow Products Limited (Manufacturer) Signed _____ (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 Alberta Boiler Safety Association of Alberta have inspected the pressure vessel part described in this Manufacturer's Data Report on October 14, 2004 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 loss of any kind arising from or connected with this inspection.

Date Oct 14, 2004 Signed _____ (Authorized Inspector) Commissions NB # 7643 A (Nat'l Board incl. endorsement, State, Province and No.)



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

Inspections Performed for: FMC Technologies Completion – Grand Junction	
Inspection Report for: HS-0028 Fuel Gas Scrubber	
Remaining Life: 20+ YRS	Date Last Inspected: 02/16/2016
Representative Corrosion Rate: 6.2 MPY	Next UT: 02/15/2017 Next VT: 02/15/2017
Manufacturer: Micoda Process Systems Inc.	Manufacturer Serial #: 1240
Year Built: 2005	National Board #: None
Alberta Registration #: None	Canadian Registration #: OH 4873.2

HS-0028 Fuel Gas Scrubber



PRESSURE VESSEL INVENTORY

☒ Code

☐ Code-invalidated

☐ Non-Code

☐ Unknown

☐ Code-Exempt

VESSEL ID INFORMATION

Business Unit/Performance Unit : Pure Energy Services (USA)
Location : Evanston, Wyoming
Skid Unit Number :
Facility/Lease/Well Name :
Equipment Number :
Eq/Circ. ID : HS0028-FGS
Equipment Name/Service : Fuel Gas Scrubber
Physical Location :
GPS Coordinates :

VESSEL DESCRIPTION AND SERVICE CONDITIONS

Type of Vessel: Vertical Fuel Gas Scrubber

Vessel Size: 7.981" I.D. x 2' 10.75"

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; Inside portable Skid Unit AHS 006

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)

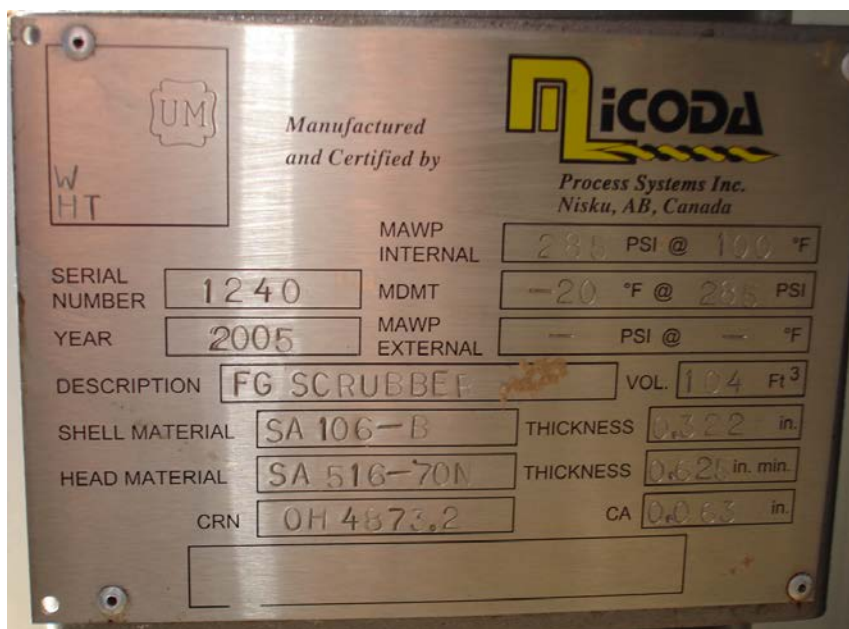
Approximate Date built or installed (check associated equipment or info at facility)

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

VESSEL DOCUMENTATION

- ☒ Drawings ☒ ASME U-1 or U-1A forms
- ☒ Equipment data sheets ☒ Material/metallurgical reports
- ☒ Welding Procedure Specifications (WPS) ☐ Design calculations
- ☒ Procedure Qualification Records (PQR)
- ☒ Welder Performance Qualifications (WPQ)
- ☒ Records of inspections during fabrication
- ☒ Heat treating records (temperature charts, instrument calibrations, etc.)
- ☒ Hydrotesting records after fabrication (pressure charts, instrument calibrations, etc.)
- ☐ Documentation relating to repair/alteration/rerating work (R-1 form, calculations, revised drawings, inspection reports, etc.). List which of these is available and where it is located.

☐ Other pertinent documentation (provide list)

Location of documentation: In data book located in Pure Energy Office – 41 Jamison Drive, Evanston, Wyoming

Name: Robert W. Menke

Date: 4/4/06

API 510 PRESSURE VESSEL EXTERNAL INSPECTION REPORT

Company Name: FMC Technologies Completion	
Field/Location: Grand Junction	
Equipment Number: HS-0028	Eq/Circ. ID: HS0028-FGS
Equipment Name/Service: Vertical Fuel Gas Scrubber	
Physical Location: Ryans Gulch	
Manufacturer: Micoda Process Systems Inc.	Manufacturer Serial #: 1240
Year Built: 2005	National Board #: None
Alberta Registration #: None	Canadian Registration #: OH 4873.2

Reason for Inspection: Scheduled API-510 External Inspection

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

Internal Access?: No

Have Corrosion Monitoring Locations (CMLs) Been Established?: Yes

Grounding Device in Place and Secure?: Yes, the equipment is grounded through the skid. The unit was not in-service during this inspection.

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

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

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

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

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

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): 10/2015

Comments:

Recommendations:

Repairs Needed:

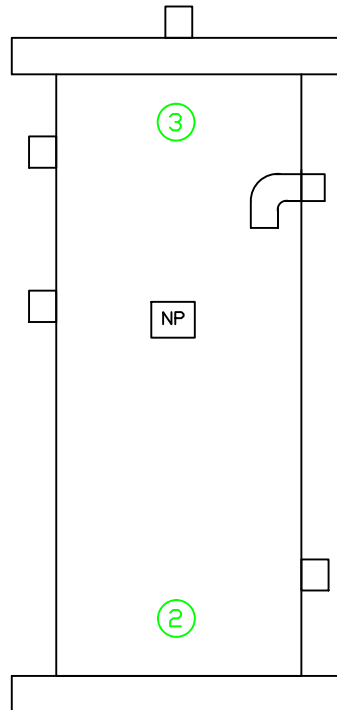
Robert W. Menke/JWW
API 510 Inspector Signature

0131
API 510 Inspector Number

02/16/2016
Date

EQUIP RETIREMENT DATE: 9/2/2042
NEXT INSPECTION IS DUE: 2/15/2017

#2. 01- BTM SHELL-FRONT 0.325 TC
#2. 02- BTM SHELL-LEFT 0.324 TC
#2. 03- BTM SHELL-BACK 0.302 TC
#2. 04- BTM SHELL-RIGHT 0.326 TC
#3. 01- TOP SHELL-FRONT 0.323 TC
#3. 02- TOP SHELL-LEFT 0.330 TC
#3. 03- TOP SHELL-BACK 0.299 TC
#3. 04- TOP SHELL-RIGHT 0.317 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	1240
NATIONAL BOARD #	NONE
DATE BUILT	2005
DESIGN P & T	285 PSI @ 100°F
NOTE	UM STAMPED CRN OH-4873.2

CAL BLK= 51°F

VESSEL= 39°F

BUSINESS UNIT	FMC TECHNOLOGIES COMPLETION
EQ/CIRC ID #	HS0028-FGS
EQUIP NAME	VERTICAL FUEL GAS SCRUBBER
LOCATION	INSIDE SKID UNIT HS-0028
DWG #	HS0028-FGS

DESC: VERTICAL FUEL GAS SCRUBBER
DWG#: HS0028-FGS-2.01-3.04

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HS0028-FGS
 Eq Type: VESSEL
 Class:
 CM RBL:
 Design Code: S8/D1

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

Description: VERTICAL FUEL GAS SCRUBBER; SN:1240

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 09/02/2042

Group Description:
 RCR = 0.2 MPY
 Rem. Life (from last survey 02/16/2016) = 26.5 yrs

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

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
2.01	BTM SHELL-FRONT	N *	0.328	04/05/2006	0.326 RR	01/25/2015	0.325 TC	02/16/2016	0.9	0.3	0.1	1.4	0.259 S	0.9	06/17/2089	02/15/2017
2.02	BTM SHELL-LEFT	N *	0.342	04/05/2006	0.310 TC	01/25/2015	0.310 RR	02/16/2016	0	3.2	2.8	5.0	0.259 S	3.2	01/24/2032	02/15/2017
2.03	BTM SHELL-BACK	N *	0.311	04/05/2006	0.307 RR	01/25/2015	0.302 TC	02/16/2016	4.7	0.9	0.5	4.7	0.259 S	4.7	04/11/2025	02/15/2017
2.04	BTM SHELL-RIGHT	N	0.319	04/05/2006	0.326 TC	01/25/2015	0.326 TC	02/16/2016	0	0	0	0.5	0.259 S	0.1	02/21/2686	02/15/2017
3.01	TOP SHELL-FRONT	N	0.323	04/05/2006	0.318 TC	01/25/2015	0.318 RR	02/16/2016	0	0.5	0.7	1.7	0.259 S	0.5	02/17/2134	02/15/2017
3.02	TOP SHELL-LEFT	N *	0.333	04/05/2006	0.337 TC	01/25/2015	0.330 TC	02/16/2016	6.6	0.3	0	6.6	0.259 S	6.6	11/19/2026	02/15/2017
3.03	TOP SHELL-BACK	N *	0.303	04/05/2006	0.305 TC	01/25/2015	0.299 TC	02/16/2016	5.7	0.4	0	5.7	0.259 S	5.7	02/22/2023	02/15/2017
3.04	TOP SHELL-RIGHT	N *	0.328	04/05/2006	0.315 TC	01/25/2015	0.315 RR	02/16/2016	0	1.3	0.7	3.4	0.259 S	1.3	03/16/2059	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HS0028-FGS
 Design Code: S8/D1
 Eq Type: VESSEL
 Class:
 CM RBI:

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

Description: VERTICAL FUEL GAS SCRUBBER; SN:1240

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	:	2.9 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	6.2 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	4.2 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 6.2 MPY

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

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

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

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

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

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

Eq/Circ ID Estimated life = 26.5 years from the most recent survey date.
 (Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 09/02/2042

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
 UT/RT Inspection Interval is 1.00 years.

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

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

for 04-475

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-1K4
(Name and address of Purchaser)

3. Location of installation Portable
(Name and address)

4. Type Vertical Fuel Gas Scrubber 1.04 cubic feet 1240
(Horz., vert., or sphere) (Tank, separator, etc.) (Capacity) (Mfg's. serial No.)
OH 4873.2 1001-1 Rev 4 2005
(CRN) (Drawing No.) (Year built)

5. ASME Code, Section VIII, Div. 1 2001 Edition, 2003 Addenda N/A
(Edition and Addenda (date)) (Code Case No.)

6. Shell (a) No. of course(s): 1 (b) Overall length (ft & in.): 2'-10.75" s/s

No.	Course(s)		Material Spec./Grade or Type	Thickness		Type	Long. Joint (Cat. A)		Circum. Joint (Cat. A, B, & C)		Heat Treatment	
	Diameter, in.	Length (ft & in.)		Nom.	Corr.		Full	Spot	None	Eff.	Temp.	Time
1	7.981"	2'-10.75"	SA-106 GR B	0.322"	0.063"	Smls	Seamless	1	1	None	.70	1150F 1 hr.
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

7. Heads: (a) SA 516-70N 1150F for 1 h (b) SA 516-70N 1150F for 1 h
(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
(a) TOP	0.625"	0.063"	N/A	N/A	N/A	N/A	N/A	7.981"	N/A	N/A	1	None .70
(b) BOTTOM	0.625"	0.063"	N/A	N/A	N/A	N/A	N/A	7.981"	N/A	N/A	1	None .70

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

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

If bar, give dimensions; if bolted describe or sketch N/A

9. MAWP 285 N/A psi at max. temp. 100 N/A °F. Min. design metal temp. -20 °F at 285 psi.
(Internal) (external) (Internal) (external)

Impact test No per UG-20(f) 1 through 5 at test temperature of N/A °F.
(Indicate yes or no and the component(s) impact tested)

11. Hydro., ~~pressure~~, ~~vacuum~~ test press. 371 Proof test N/A

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/ Relief	2	1"	CPLG	SA-105N	-	3000	0.0625"	N/A	UW-16.1(a)	-	Shell
Outlet	1	2"	CPLG	SA-105N	-	3000	0.0625"	N/A	UW-16.1(a)	-	Head
Drain	1	3/4"	CPLG	SA-105N	-	3000	0.0625	N/A	UW-16.1(a)	-	Shell
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

13. Supports: Skirt No Lugs No Legs No Others N/A Attached N/A
(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. 05-579-FGS Rev. 0
PSV to 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 3/04/2005 Name MICODA PROCESS SYSTEMS INC.

Signed [Signature]
(Representative)

Signed [Signature]
(Certified Individual)

API 570 Piping External Inspection

Company Name: FMC Technologies Completion	District Name: Grand Junction
Line Name/Number: All associated piping on Unit HS-0038	
Size/Sched. Of Pipe: 1.000"; 6.000"	Eq/Circ. ID:
Service/System:	Piping Class ☐ 1 ☒ 2 ☐ 3 ☐ Other
Design Pressure: 735 psi (PSV piping 150 psi)	Materials: ☒ CS ☐ SS ☐ Other
Design Temperature: 100°F	Note Stamping (If Any)
P&ID#:	Flange Rating: 300#STD

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	Coating has minor chipping.

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	Vessel was not in service at the time of this inspection.

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

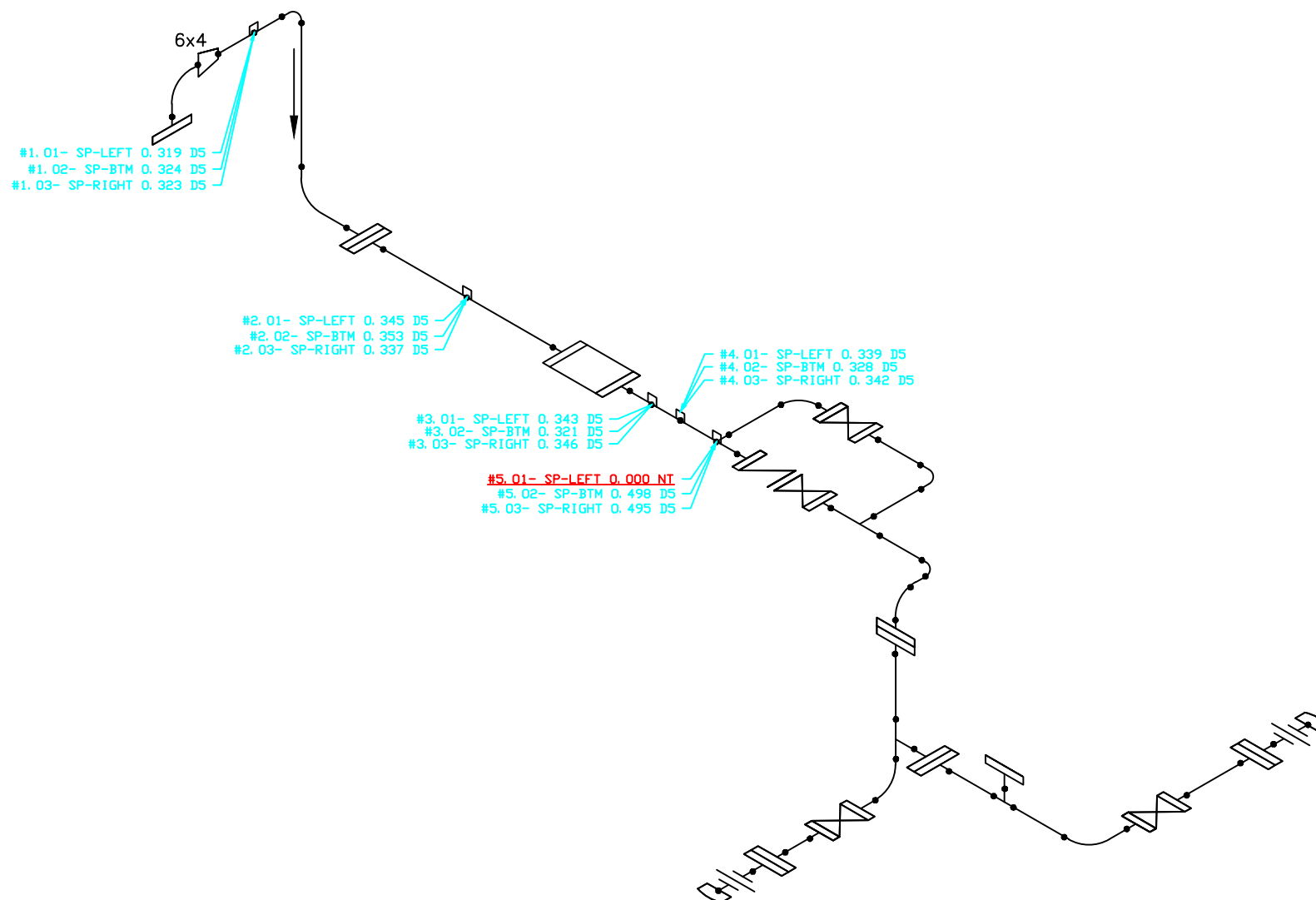
Relief Device:	Comments:
☒ PSV No PSV ☐ Rupture Disk ☐ Atmospheric ☐ No Relief Device Identified For This Equipment ☒ Tag Secure and Legible ☒ Set Pressure At Or Below MAWP ☐ Block Valve Not Locked/Car Sealed In Open Position ☐ Improper Drain Hole/Weather Cap On Atmos. Discharge ☐ Obstruction (i.e. Debris) ☐ Relief Installed In A Position Other Than Horiz. Or Upright ☐ Other ☒ No Issues	PSV is installed next to the roof with no outlet to outside.

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	Supports show no issues.

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	Flanged connections are in good condition with bolts fully engaged.

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	There are no mechanical issues visible.

EQUIP RETIREMENT DATE: 3/3/2040
NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P1

TEMP= °F
CAL BLK= °F

DA-512

DESC: GAS OUT-6/4/3 SCH80/40 PIPE
DWG#: GAS-OUT-SP-1.01-5.03

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

(report in inches, corrosion rates in MPY)
 Analysis: Straight Line

Unit: HS-0028
 Eq/Circ ID: GAS 001-SP
 Eq Type: PIPING
 Class:
 CM RBL:
 Design Code: B31.3

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

Description: 3,4,6 INCH SCH80/40 GAS 001 LINES
 READINGS AT INJECTION PORTS

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 03/03/2040

Group Description:
 RCR = 20.5 MPY
 Rem. Life (from last survey 02/16/2016) = 24.0 yrs

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

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
1.01	SP-LEFT	N *	0.329	06/18/2013	0.329 RR	06/25/2014	0.319 D5	02/16/2016	6.1	3.8	4.0	6.1	0.206 P	6.1	08/31/2034	02/15/2017
1.02	SP-BTM	N	0.316	06/18/2013	0.316 RR	06/25/2014	0.319 RR	02/16/2016	0	0	0	0	0.206 P	0.1	11/26/3146	02/15/2017
1.03	SP-RIGHT	N	0.320	06/18/2013	0.320 RR	06/25/2014	0.323 D5	02/16/2016	0	0	0	0	0.206 P	0.1	11/26/3186	02/15/2017
2.01	SP-LEFT	N	0.343	06/18/2013	0.341	01/25/2015	0.341 RR	02/16/2016	0	0.8	0.9	3.4	0.206 P	0.8	12/21/2184	02/15/2017
2.02	SP-BTM	N	0.339	06/18/2013	0.340	01/25/2015	0.340 RR	02/16/2016	0	0	0	0	0.206 P	0.1	11/26/3356	02/15/2017
2.03	SP-RIGHT	N	0.327	06/18/2013	0.332 RR	01/25/2015	0.336 RR	02/16/2016	0	0	0	0	0.206 P	0.1	11/26/3316	02/15/2017
3.01	SP-LEFT	N	0.341	06/18/2013	0.343	01/25/2015	0.343 D5	02/16/2016	0	0	0	0	0.206 P	0.1	11/27/3386	02/15/2017
3.02	SP-BTM	N *	0.330	06/18/2013	0.332 RR	01/25/2015	0.321 D5	02/16/2016	10.4	3.4	3.1	10.4	0.206 P	10.4	03/11/2027	02/15/2017
3.03	SP-RIGHT	N *	0.327	06/18/2013	0.322	01/25/2015	0.322 RR	02/16/2016	0	1.9	2.2	8.5	0.206 P	1.9	03/21/2077	02/15/2017
4.01	SP-LEFT	N *	0.345	06/18/2013	0.346	01/25/2015	0.339 D5	02/16/2016	6.6	2.3	2.1	6.6	0.206 P	6.6	04/15/2036	02/15/2017
4.02	SP-BTM	N *	0.330	06/18/2013	0.332 RR	01/25/2015	0.328 D5	02/16/2016	3.8	0.8	0.6	3.8	0.206 P	3.8	04/02/2048	02/15/2017
4.03	SP-RIGHT	N	0.345	06/18/2013	0.342	01/25/2015	0.342 D5	02/16/2016	0	1.1	1.3	5.1	0.206 P	1.1	11/01/2139	02/15/2017
5.01	SP-LEFT	Y *	0.336	06/18/2013	0.336 RR	06/25/2014	0.310	01/25/2015	44.4	16.2	14.4	44.4	0.206 P	44.4	05/30/2017	01/25/2016
5.02	SP-BTM	N	0.339	06/18/2013	0.337	01/25/2015	0.337 RR	02/16/2016	0	0.8	0.9	3.4	0.206 P	0.8	12/22/2179	02/15/2017
5.03	SP-RIGHT	N	0.331	06/18/2013	0.332	01/25/2015	0.332 RR	02/16/2016	0	0	0	0	0.206 P	0.1	11/25/3276	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
Eq/Circ ID: GAS OUT-SP
Design Code: B31.3
Eq Type: PIPING
Class:
CM RBI:

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

Description: 3,4,6 INCH SCH80/40 GAS OUT LINES
READINGS AT INJECTION PORTS

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	:	5.1 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	20.5 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	6.8 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 20.5 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 6 months.

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

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

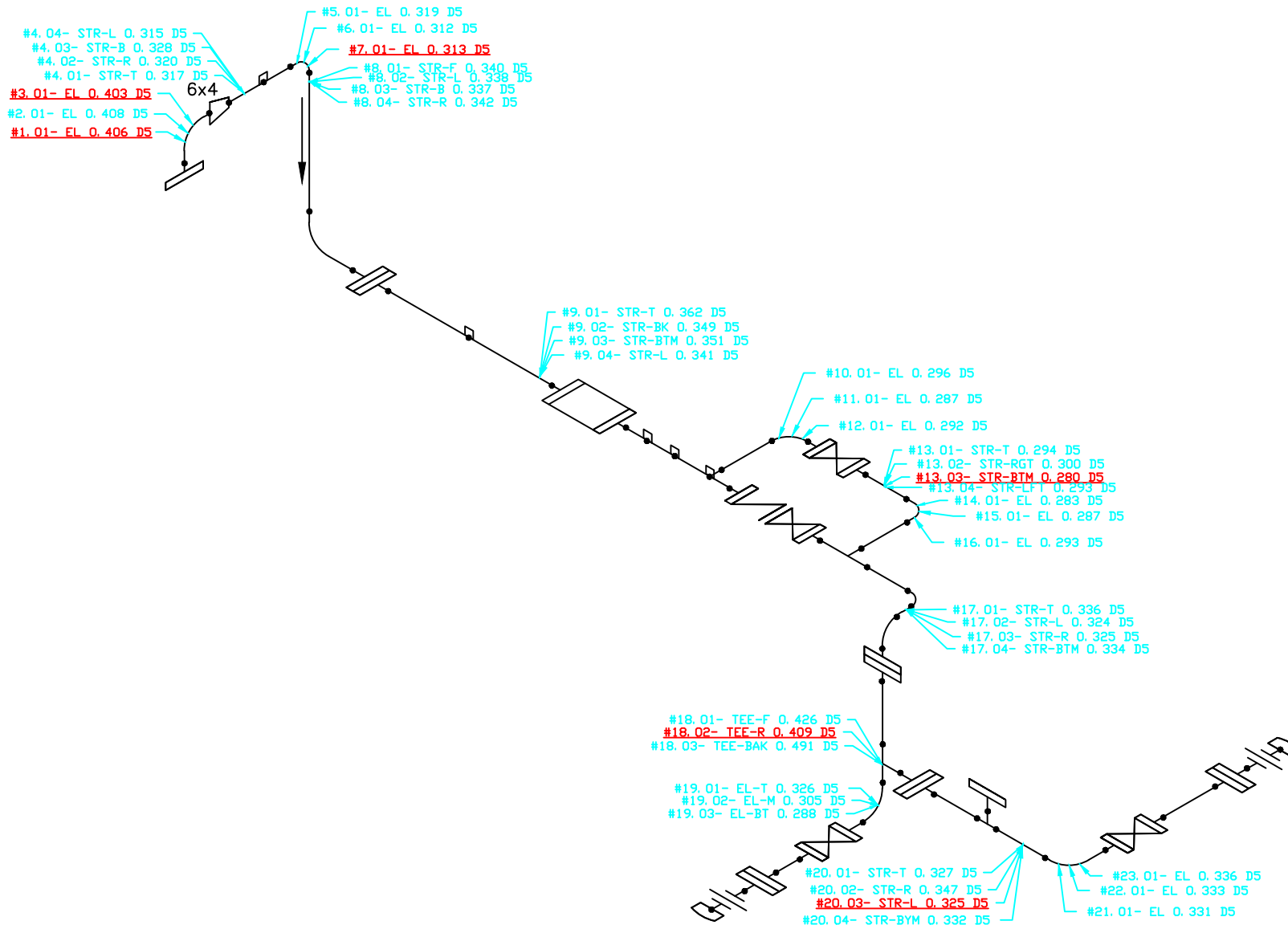
Eq/Circ ID Estimated life = 24.0 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 03/03/2040

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
UT/RT Inspection Interval is 1.00 years.

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

EQUIP RETIREMENT DATE: 10/28/2022
 NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P1

TEMP= °F
 CAL BLK= °F

DA-512

DESC: GAS OUT-6/4/3 SCH80/40 PIPE
 DWG#: GAS-OUT-1.01-23.01

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date:06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: GAS 001
 Eq Type: PIPING
 Class:
 CM RBL:
 Design Code: B31.3

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

Description: GAS 001-6,3,4INCH SCH80 PIPE

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 15.1 MPY
 Pred. Ret. Date = 10/28/2022 Rem. Life (from last survey 02/16/2016) = 6.7 yrs

0 C.A. Status: NO
 Total Caution IMLs = 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	Y *	0.408	04/05/2006	0.428	01/25/2015	0.406 D5	02/16/2016	20.8	0.2	0	20.8	0.303 P	20.8	01/26/2021	02/15/2017
2.01	EL	N	0.408	04/05/2006	0.420	01/25/2015	0.408 D5	02/16/2016	11.3	0	0	11.3	0.303 P	11.3	05/28/2025	02/15/2017
3.01	EL	Y *	0.414	04/05/2006	0.420	01/25/2015	0.403 D5	02/16/2016	16.0	1.1	0.3	16.0	0.303 P	16.0	05/14/2022	02/15/2017
4.01	STR-T	N	0.312	04/05/2006	0.325 RR	01/25/2015	0.317 D5	02/16/2016	7.6	0	0	15.3	0.206 P	7.6	09/28/2030	02/15/2017
4.02	STR-R	N *	0.335	04/05/2006	0.334 RR	01/25/2015	0.320 D5	02/16/2016	13.2	1.5	0.9	13.2	0.206 P	13.2	10/08/2024	02/15/2017
4.03	STR-B	N	0.329	04/05/2006	0.331	01/25/2015	0.328 D5	02/16/2016	2.8	0.1	0.5	12.2	0.206 P	2.8	09/22/2059	02/15/2017
4.04	STR-L	N	0.327	04/05/2006	0.328	01/25/2015	0.315 D5	02/16/2016	12.3	1.2	0.9	12.3	0.206 P	12.3	12/29/2024	02/15/2017
5.01	EL	N	0.322	04/05/2006	0.330	01/25/2015	0.319 D5	02/16/2016	10.4	0.3	0.5	13.2	0.206 P	10.4	12/31/2026	02/15/2017
6.01	EL	N	0.313	04/05/2006	0.317	01/25/2015	0.312 D5	02/16/2016	4.7	0.1	0.4	12.2	0.206 P	4.7	09/11/2038	02/15/2017
7.01	EL	Y *	0.316	04/05/2006	0.331 RR	01/25/2015	0.313 D5	02/16/2016	17.0	0.3	0.1	17.0	0.206 P	17.0	06/05/2022	02/15/2017
8.01	STR-F	N	0.344	04/05/2006	0.344 RR	01/25/2015	0.340 D5	02/16/2016	3.8	0.4	0.4	10.2	0.206 P	3.8	05/30/2051	02/15/2017
8.02	STR-L	N	0.354	04/05/2006	0.338	01/25/2015	0.338 D5	02/16/2016	0	1.6	2.1	3.3	0.206 P	1.6	09/03/2098	02/15/2017
8.03	STR-B	N	0.337	04/05/2006	0.349	01/25/2015	0.337 D5	02/16/2016	11.3	0	0.4	11.3	0.206 P	11.3	09/23/2027	02/15/2017
8.04	STR-R	N	0.343	04/05/2006	0.349	01/25/2015	0.342 D5	02/16/2016	6.6	0.1	0	6.6	0.206 P	6.6	09/29/2036	02/15/2017
9.01	STR-T	N	0.326	04/05/2006	0.362	01/25/2015	0.362 D5	02/16/2016	0	0	0	31.5	0.206 P	0.1	11/28/3576	02/15/2017
9.02	STR-BK	N	0.327	04/05/2006	0.350	01/25/2015	0.349 D5	02/16/2016	0.9	0	0	18.3	0.206 P	0.9	02/07/2175	02/15/2017
9.03	STR-BTM	N	0.330	04/05/2006	0.338	01/25/2015	0.338 RR	02/16/2016	0	0	0	7.1	0.206 P	0.1	11/26/3336	02/15/2017
9.04	STR-L	N	0.318	04/05/2006	0.337 RR	01/25/2015	0.338 RR	02/16/2016	0	0	0	8.1	0.206 P	0.1	11/26/3336	02/15/2017
10.01	EL	N	0.271	04/05/2006	0.294	01/25/2015	0.294 RR	02/16/2016	0	0	0	11.2	0.160 P	0.1	07/08/3354	02/15/2017
11.01	EL	N	0.272	04/05/2006	0.299	01/25/2015	0.287 D5	02/16/2016	11.3	0	0	15.3	0.160 P	11.3	05/09/2027	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: GAS OUT
 Eq Type: PIPING
 Class:
 CM RBL:
 Design Code: B31.3

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

Description: GAS OUT-6,3,4INCH SCH80 PIPE

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 15.1 MPY
 Pred. Ret. Date = 10/28/2022 Rem. Life (from last survey 02/16/2016) = 6.7 yrs

Ø C.A. Status: No
 Total Caution IMLS = 6

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
12.01	EL	N	0.287	04/05/2006	0.289	01/25/2015	0.289 RR	02/16/2016	0	0	0.2	6.8	0.160 P	0.1	07/07/3304	02/15/2017
13.01	STR-T	N	0.283	04/05/2006	0.308	01/25/2015	0.294 D5	02/16/2016	13.2	0	0	13.2	0.160 P	13.2	04/07/2026	02/15/2017
13.02	STR-RGT	N	0.274	04/05/2006	0.302	01/25/2015	0.300 D5	02/16/2016	1.9	0	0	7.1	0.160 P	1.9	09/22/2089	02/15/2017
13.03	STR-BTM	Y *	0.288	04/05/2006	0.298 RR	01/25/2015	0.280 D5	02/16/2016	17.0	0.8	0.4	17.0	0.160 P	17.0	03/06/2023	02/15/2017
13.04	STR-LFT	N	0.280	04/05/2006	0.300	01/25/2015	0.293 D5	02/16/2016	6.6	0	0	10.5	0.160 P	6.6	04/02/2036	02/15/2017
14.01	EL	N	0.282	04/05/2006	0.290	01/25/2015	0.283 D5	02/16/2016	6.6	0	0.3	14.2	0.160 P	6.6	09/27/2034	02/15/2017
15.01	EL	N	0.280	04/05/2006	0.287	01/25/2015	0.287 D5	02/16/2016	0	0	0	5.1	0.160 P	0.1	07/06/3284	02/15/2017
16.01	EL	N	0.280	04/05/2006	0.274	01/25/2015	0.274 RR	02/16/2016	0	0.6	0.7	6.8	0.160 P	0.6	11/10/2205	02/15/2017
17.01	STR-T	N	0.313	04/05/2006	0.330 RR	01/25/2015	0.331 RR	02/16/2016	0	0	0	11.2	0.206 P	0.1	11/26/3266	02/15/2017
17.02	STR-L	N	0.320	04/05/2006	0.321	01/25/2015	0.321 RR	02/16/2016	0	0	0.2	9.2	0.206 P	0.1	11/26/3166	02/15/2017
17.03	STR-R	N	0.336	04/05/2006	0.335 RR	01/25/2015	0.325 D5	02/16/2016	9.4	1.1	0.3	9.4	0.206 P	9.4	10/17/2028	02/15/2017
17.04	STR-BTM	N	0.320	04/05/2006	0.334	01/25/2015	0.334 D5	02/16/2016	0	0	0	12.2	0.206 P	0.1	11/25/3296	02/15/2017
18.01	TEE-F	N	0.396	04/05/2006	0.415 RR	01/25/2015	0.417 RR	02/16/2016	0	0	0	6.9	0.206 P	0.1	03/02/4016	02/15/2017
18.02	TEE-R	Y	0.492	04/05/2006	0.425	01/25/2015	0.409 D5	02/16/2016	15.1	8.4	8.4	58.9	0.206 P	15.1	07/29/2029	02/15/2017
18.03	TEE-BAK	N	0.414	04/05/2006	0.485 RR	01/25/2015	0.490 RR	02/16/2016	0	0	0	25.9	0.206 P	0.1	03/02/4016	02/15/2017
19.01	EL-T	N	0.316	04/05/2006	0.295	01/25/2015	0.295 RR	02/16/2016	0	2.1	5.2	89.5	0.206 P	2.1	07/18/2058	02/15/2017
19.02	EL-M	N		N/A		N/A	0.305 D5	02/16/2016	N/A	N/A	N/A	0	0.206 P	0.1	11/25/3006	02/15/2017
19.03	EL-BT	N		N/A		N/A	0.288 D5	02/16/2016	N/A	N/A	N/A	0	0.206 P	0.1	11/22/2836	02/15/2017
20.01	STR-T	N	0.341	04/05/2006	0.332 RR	01/25/2015	0.327 D5	02/16/2016	4.7	1.4	1.0	11.6	0.206 P	4.7	11/20/2041	02/15/2017
20.02	STR-R	N	0.356	04/05/2006	0.353	01/25/2015	0.347 D5	02/16/2016	5.7	0.9	1.7	11.8	0.206 P	5.7	11/16/2040	02/15/2017
20.03	STR-L	Y *	0.336	04/05/2006	0.343 RR	01/25/2015	0.325 D5	02/16/2016	17.0	1.1	0	17.0	0.206 P	17.0	02/17/2023	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: GAS OUT
 Eq Type: PIPING
 Class:
 CM RBL:
 Design Code: B31.3

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

Description: GAS OUT-6,3,4INCH SCH80 PIPE

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 10/28/2022

Group Description:
 RCR = 15.1 MPY
 Rem. Life (from last survey 02/16/2016) = 6.7 yrs

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

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
20.04	STR-BYM	N	0.319	04/05/2006	0.320	01/25/2015	0.320 RR	02/16/2016	0	0	0	17.1	0.206 P	0.1	11/25/3156	02/15/2017
21.01	EL	N	0.341	04/05/2006	0.345	01/25/2015	0.331 D5	02/16/2016	13.2	1.0	0.8	13.2	0.206 P	13.2	08/08/2025	02/15/2017
22.01	EL	N	0.325	04/05/2006	0.334	01/25/2015	0.333 D5	02/16/2016	0.9	0	0	8.7	0.206 P	0.9	04/28/2157	02/15/2017
23.01	EL	N	0.333	04/05/2006	0.331 RR	01/25/2015	0.332 RR	02/16/2016	0	0.1	0.5	9.4	0.206 P	0.1	11/25/3276	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: GAS OUT
 Design Code: B31.3
 Eq Type: PIPING
 Class:
 CM RBI:

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

Description: GAS OUT-6,3,4INCH 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	:	5.9 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	15.1 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	7.0 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 15.1 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).

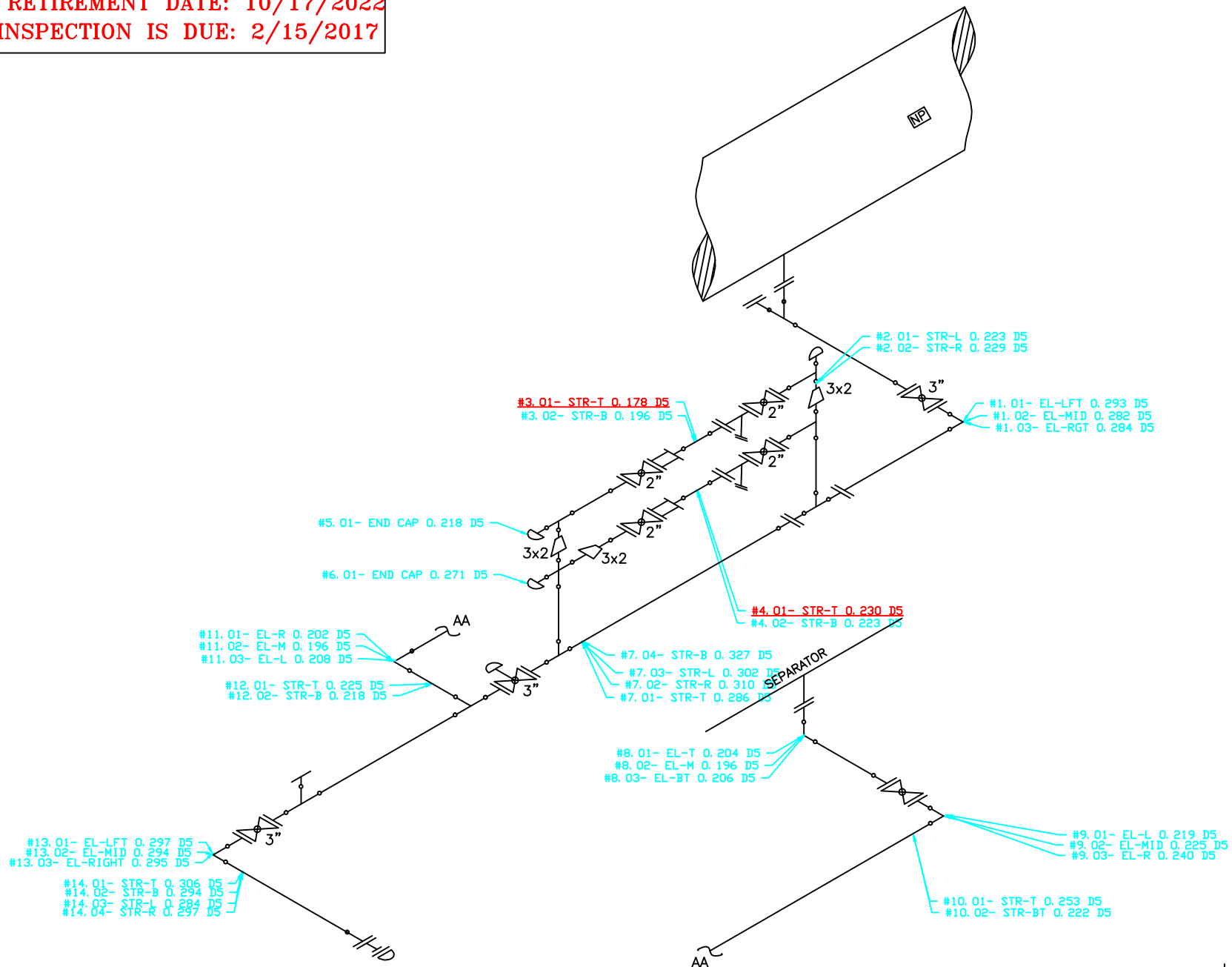
Eq/Circ ID Estimated life = 6.7 years from the most recent survey date.
 (Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 10/28/2022

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
 UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
 There are 6 Caution TMLs in this Eq/Circ ID.

EQUIP RETIREMENT DATE: 10/17/2022
NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P2

DESC: OIL OUT-2,3 INCH SCH80 PIPE
DWG#: OIL-OUT-1.01-14.04

DA-512

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: OIL OUI
 Eq Type: PIPING
 Class: 2
 CM RBL:
 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 OUI LINE

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 10/17/2022

Group Description:
 RCR = 10.9 MPY
 Rem. Life (from last survey 02/16/2016) = 6.7 yrs

0 C.A. Status: NO
 Total Caution IMLs = 2

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-LFT	N	0.293	04/08/2009	0.283	01/25/2015	0.283 RR	02/16/2016	0	1.5	0.5	13.7	0.168 P	1.5	08/12/2092	02/15/2017
1.02	EL-MID	N	0.291	04/05/2006	0.281	01/25/2015	0.281 RR	02/16/2016	0	1.0	0.5	5.8	0.168 P	1.0	11/10/2128	02/15/2017
1.03	EL-RGT	N	0.290	04/08/2009	0.284	01/25/2015	0.284 D5	02/16/2016	0	0.9	1.0	10.6	0.168 P	0.9	09/19/2144	02/15/2017
2.01	STR-L	N	0.227	04/05/2006	0.216	01/25/2015	0.216 RR	02/16/2016	0	1.1	1.5	11.2	0.120 S	1.1	05/27/2103	02/15/2017
2.02	STR-R	N	0.239	04/05/2006	0.220 RR	01/25/2015	0.225 RR	02/16/2016	0	1.4	1.6	14.2	0.120 S	1.4	02/16/2091	02/15/2017
3.01	STR-T	Y *	0.254	04/05/2006	0.200	01/25/2015	0.178 D5	02/16/2016	20.8	7.7	6.2	54.6	0.120 S	20.8	11/30/2018	02/15/2017
3.02	STR-B	N	0.219	04/05/2006	0.205	01/25/2015	0.196 D5	02/16/2016	8.5	2.3	1.7	22.2	0.120 S	8.5	01/25/2025	02/15/2017
4.01	STR-T	Y *	0.247	04/05/2006	0.246 RR	01/25/2015	0.230 D5	02/16/2016	15.1	1.7	1.0	15.1	0.120 S	15.1	05/31/2023	02/15/2017
4.02	STR-B	N	0.223	04/05/2006	0.210 RR	01/25/2015	0.212 RR	02/16/2016	0	1.1	1.5	7.1	0.120 S	1.1	10/06/2099	02/15/2017
5.01	END CAP	N *	0.254	04/05/2006	0.183	01/25/2015	0.183 RR	02/16/2016	0	7.2	7.9	12.8	0.120 S	7.2	11/16/2024	02/15/2017
6.01	END CAP	N	0.300	04/05/2006	0.256	01/25/2015	0.256 RR	02/16/2016	0	4.5	4.1	33.0	0.168 P	4.5	08/16/2035	02/15/2017
7.01	STR-T	N	0.334	04/05/2006	0.287 RR	01/25/2015	0.286 D5	02/16/2016	0.9	4.9	5.1	18.5	0.168 P	4.9	02/26/2040	02/15/2017
7.02	STR-R	N	0.303	04/05/2006	0.289 RR	01/25/2015	0.290 RR	02/16/2016	0	1.3	1.8	10.2	0.168 P	1.3	10/08/2109	02/15/2017
7.03	STR-L	N	0.314	04/05/2006	0.290	01/25/2015	0.290 RR	02/16/2016	0	2.4	2.8	9.8	0.168 P	2.4	11/06/2066	02/15/2017
7.04	STR-B	N	0.298	04/05/2006	0.282	01/25/2015	0.282 RR	02/16/2016	0	1.6	1.0	13.7	0.168 P	1.6	03/18/2087	02/15/2017
8.01	EL-T	N	0.196	01/26/2012	0.190	01/25/2015	0.190 RR	02/16/2016	0	1.5	1.6	10.2	0.168 P	1.5	08/12/2030	02/15/2017
8.02	EL-M	N		N/A		N/A	0.196 D5	02/16/2016	N/A	N/A	N/A	0	0.168 P	0.1	06/10/2293	02/15/2017
8.03	EL-BT	N		N/A		N/A	0.206 D5	02/16/2016	N/A	N/A	N/A	0	0.168 P	0.1	06/11/2393	02/15/2017
9.01	EL-L	N *	0.230	02/14/2012	0.228	01/25/2015	0.219 D5	02/16/2016	8.5	2.7	2.3	8.5	0.168 P	8.5	02/04/2022	02/15/2017
9.02	EL-MID	N	0.211	01/26/2012	0.228	01/25/2015	0.225 D5	02/16/2016	2.8	0	0	5.5	0.168 P	2.8	05/21/2036	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: OIL OUT
 Eq Type: PIPING
 Class: 2
 CM RBL:
 Design Code: B31.3

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

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

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 10/17/2022

Group Description:
 RCR = 10.9 MPY
 Rem. Life (from last survey 02/16/2016) = 6.7 yrs

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

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
9.03	EL-R	N	0.238	02/14/2012	0.229	01/25/2015	0.229 RR	02/16/2016	0	2.2	1.6	16.5	0.168 P	2.2	09/25/2043	02/15/2017
10.01	STR-T	N	0.233 RP	01/25/2015		N/A	0.233 RR	02/16/2016	N/A	0	N/A	9.8	0.168 P	0.1	06/13/2663	02/15/2017
10.02	STR-BT	N *	0.230 RP	01/25/2015		N/A	0.222 D5	02/16/2016	N/A	7.6	N/A	15.7	0.168 P	7.6	03/13/2023	02/15/2017
11.01	EL-R	N	0.213	04/05/2006	0.188	01/25/2015	0.188 RR	02/16/2016	0	2.5	2.8	6.8	0.114 P	2.5	08/27/2045	02/15/2017
11.02	EL-M	N		N/A		N/A	0.196 D5	02/16/2016	N/A	N/A	N/A	0	0.114 P	0.1	04/26/2834	02/15/2017
11.03	EL-L	N		N/A		N/A	0.208 D5	02/16/2016	N/A	N/A	N/A	0	0.114 P	0.1	04/27/2954	02/15/2017
12.01	STR-T	N	0.248	04/05/2006	0.216 RR	01/25/2015	0.221 RR	02/16/2016	0	2.7	3.8	22.2	0.120 S	2.7	07/14/2053	02/15/2017
12.02	STR-B	N	0.226	04/05/2006	0.216 RR	01/25/2015	0.218 D5	02/16/2016	0	0.8	0.8	6.8	0.120 S	0.8	08/18/2138	02/15/2017
13.01	EL-LFT	N	0.294	04/08/2009	0.296	01/25/2015	0.296 RR	02/16/2016	0	0	0	8.5	0.168 P	0.1	06/17/3293	02/15/2017
13.02	EL-MID	N	0.299	04/05/2006	0.290	01/25/2015	0.290 RR	02/16/2016	0	0.9	0.9	13.7	0.168 P	0.9	05/21/2151	02/15/2017
13.03	EL-RIGHT	N	0.295	04/08/2009	0.291	01/25/2015	0.291 RR	02/16/2016	0	0.6	0.1	15.4	0.168 P	0.6	09/06/2220	02/15/2017
14.01	STR-T	N	0.314	04/05/2006	0.303	01/25/2015	0.303 RR	02/16/2016	0	1.1	1.3	11.2	0.168 P	1.1	08/12/2138	02/15/2017
14.02	STR-B	N	0.295	04/05/2006	0.298	01/25/2015	0.294 D5	02/16/2016	3.8	0.1	0	9.2	0.168 P	3.8	03/19/2049	02/15/2017
14.03	STR-L	N *	0.301	04/05/2006	0.299	01/25/2015	0.284 D5	02/16/2016	14.2	1.7	0.9	14.2	0.168 P	14.2	04/11/2024	02/15/2017
14.04	STR-R	N	0.308	04/05/2006	0.302	01/25/2015	0.297 D5	02/16/2016	4.7	1.1	0.5	13.7	0.168 P	4.7	07/08/2043	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: OIL OUT
 Design Code: B31.3
 Eq Type: PIPING
 Class: 2
 CM RBI:

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

Description: 2,3 INCH SCH 80 PIPE-OIL OUT 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	:	3.7 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	10.9 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	4.5 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 10.9 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).

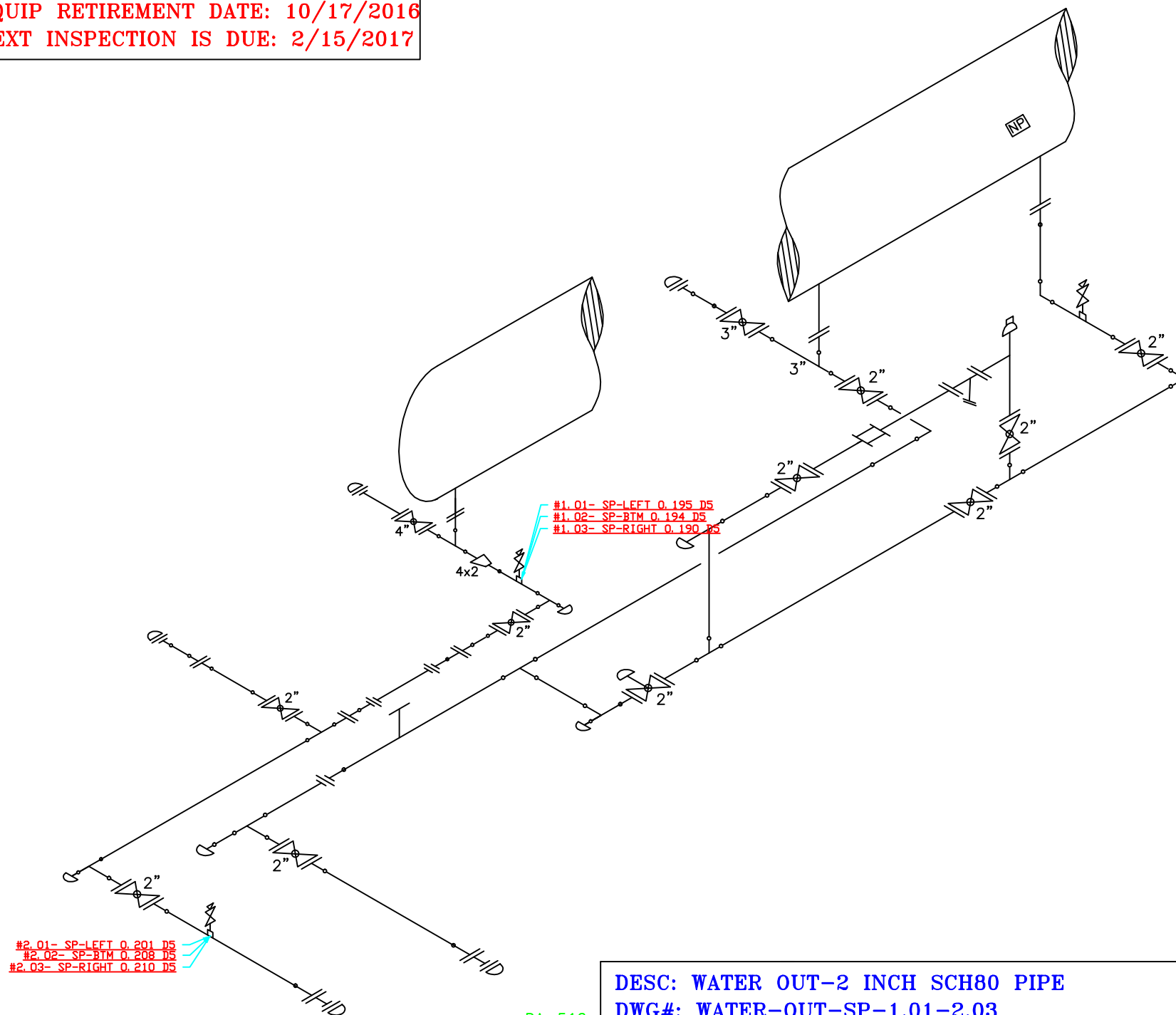
Eq/Circ ID Estimated life = 6.7 years from the most recent survey date.
 (Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 10/17/2022

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
 UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
 There are 2 Caution TMLs in this Eq/Circ ID.

EQUIP RETIREMENT DATE: 10/17/2016
NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P3

DESC: WATER OUT-2 INCH SCH80 PIPE
DWG#: WATER-OUT-SP-1.01-2.03

DA-512

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: WATER OUI-SP
 Eq Type: PIPING
 Class:
 CM RBL:
 Design Code: B31.3

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

Description: 2 INCH WATER OUI PIPING
 READINGS AT INJECTION PORTS

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 10/17/2016

Group Description:
 RCR = 214.4 MPY
 Rem. Life (from last survey 02/16/2016) = 0.7 yrs

0 C.A. Status: NO
 Total Caution IMLs = 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	SP-LEFT	Y *	0.363	06/18/2013	0.363	01/25/2015	0.195 D5	02/16/2016	158.6	63.1	60.6	158.6	0.109 P	158.6	09/02/2016	02/15/2017
1.02	SP-BTM	Y *	0.357	06/18/2013	0.363	01/25/2015	0.194 D5	02/16/2016	159.5	61.2	58.4	159.5	0.109 P	159.5	08/29/2016	02/15/2017
1.03	SP-RIGHT	Y *	0.360	06/18/2013	0.363	01/25/2015	0.190 D5	02/16/2016	163.3	63.9	61.1	163.3	0.109 P	163.3	08/16/2016	02/15/2017
2.01	SP-LEFT	Y *	0.347	06/18/2013	0.342	01/25/2015	0.201 D5	02/16/2016	133.1	54.8	53.1	133.1	0.109 P	133.1	10/26/2016	02/15/2017
2.02	SP-BTM	Y *	0.333	06/18/2013	0.336 RR	01/25/2015	0.208 D5	02/16/2016	120.8	46.9	44.9	120.8	0.109 P	120.8	12/12/2016	02/15/2017
2.03	SP-RIGHT	Y *	0.327	06/18/2013	0.326	01/25/2015	0.210 D5	02/16/2016	109.5	43.9	42.3	109.5	0.109 P	109.5	01/19/2017	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: WATER OUT-SP
 Design Code: B31.3
 Eq Type: PIPING
 Class:
 CM RBI:

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

Description: 2 INCH WATER OUT PIPING
 READINGS AT INJECTION PORTS

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	:	140.8 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	161.4 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	214.4 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 214.4 MPY

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

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

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

Minimum time between inspections required for corrosion rate calculation is 6 months.

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

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

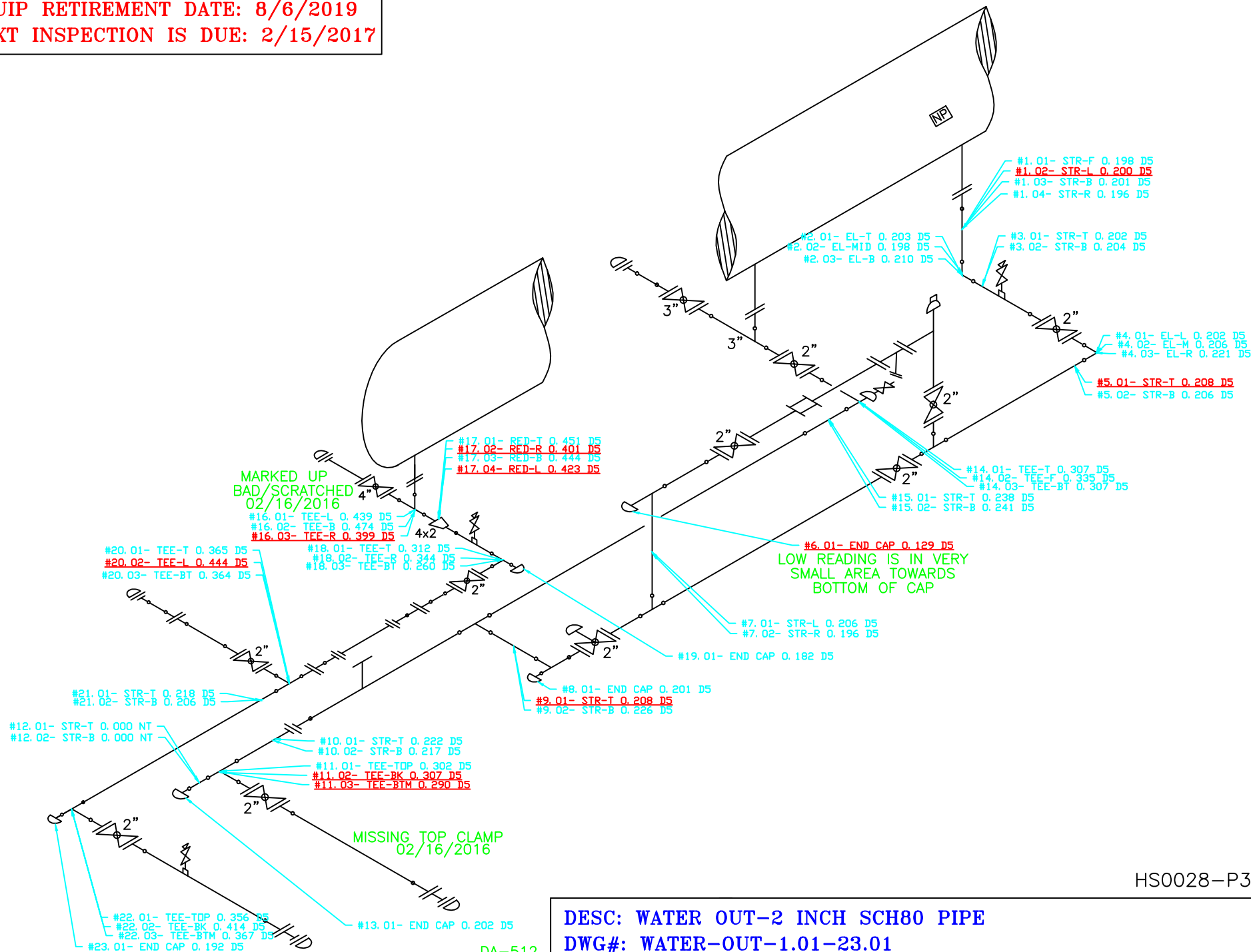
Eq/Circ ID Estimated life = 0.7 years from the most recent survey date.
 (Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 10/17/2016

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
 UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
 There are 6 Caution TMLs in this Eq/Circ ID.

EQUIP RETIREMENT DATE: 8/6/2019
NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P3

DESC: WATER OUT-2 INCH SCH80 PIPE
DWG#: WATER-OUT-1.01-23.01

DA-512

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: WATER OUI
 Eq Type: PIPING
 Class: Z
 CM RBL:
 Design Code: B31.3

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

Description: WATER OUI-3 INCH SCH80 PIPE

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 20.0 MPY
 Pred. Ret. Date = 08/06/2019 Rem. Life (from last survey 02/16/2016) = 3.5 yrs

0 C.A. Status: NO
 Total Caution IMLs = 10

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	0.202	02/14/2012	0.205	01/25/2015	0.198 D5	02/16/2016	6.6	1.0	0	14.1	0.120 S	6.6	12/12/2027	02/15/2017
1.02	STR-L	Y *	0.200	01/26/2012	0.218 RR	01/25/2015	0.200 D5	02/16/2016	17.0	0	0	17.0	0.120 S	17.0	10/31/2020	02/15/2017
1.03	STR-B	N	0.204	02/14/2012	0.215 RR	01/25/2015	0.201 D5	02/16/2016	13.2	0.7	0	14.1	0.120 S	13.2	04/06/2022	02/15/2017
1.04	STR-R	N	0.199	01/26/2012	0.210	01/25/2015	0.196 D5	02/16/2016	13.2	0.7	0	13.2	0.120 S	13.2	11/19/2021	02/15/2017
2.01	EL-T	N	0.216	02/14/2012	0.210 RR	01/25/2015	0.203 D5	02/16/2016	6.6	3.2	0.9	33.0	0.120 S	6.6	09/13/2028	02/15/2017
2.02	EL-MID	N	0.196	01/26/2012	0.206 RR	01/25/2015	0.198 D5	02/16/2016	7.6	0	0	7.6	0.120 S	7.6	05/23/2026	02/15/2017
2.03	EL-B	N *	0.206	02/14/2012	0.167	01/25/2015	0.167 RR	02/16/2016	0	9.7	11.0	18.5	0.120 S	9.7	12/21/2020	02/15/2017
3.01	STR-T	N	0.206	02/14/2012	0.210 RR	01/25/2015	0.202 D5	02/16/2016	7.6	1.0	0	9.4	0.120 S	7.6	12/01/2026	02/15/2017
3.02	STR-B	N	0.204	02/14/2012	0.202	01/25/2015	0.202 RR	02/16/2016	0	0.5	0.2	22.2	0.120 S	0.5	02/17/2180	02/15/2017
4.01	EL-L	N	0.176 RP	05/11/2010	0.197 RR	01/25/2015	0.199 RR	02/16/2016	0	0	0	4.9	0.114 P	0.1	04/25/2864	02/15/2017
4.02	EL-M	N		N/A		N/A	0.206 D5	02/16/2016	N/A	N/A	N/A	0	0.114 P	0.1	04/27/2934	02/15/2017
4.03	EL-R	N		N/A		N/A	0.221 D5	02/16/2016	N/A	N/A	N/A	0	0.114 P	0.1	04/27/3084	02/15/2017
5.01	STR-T	Y *	0.192 RP	05/11/2010	0.232 RR	01/25/2015	0.208 D5	02/16/2016	22.7	0	0	22.7	0.120 S	22.7	01/02/2020	02/15/2017
5.02	STR-B	N	0.195 RP	05/11/2010	0.218 RR	01/25/2015	0.206 D5	02/16/2016	11.3	0	0	11.3	0.120 S	11.3	09/27/2023	02/15/2017
6.01	END CAP	Y *	0.219 RP	05/11/2010	0.130	01/25/2015	0.129 D5	02/16/2016	0.9	15.6	15.0	70.5	0.120 S	15.6	09/14/2016	02/15/2017
7.01	STR-L	N	0.200 RP	05/11/2010	0.192	01/25/2015	0.192 RR	02/16/2016	0	1.4	1.1	30.7	0.120 S	1.4	07/22/2067	02/15/2017
7.02	STR-R	N	0.202 RP	05/11/2010	0.207 RR	01/25/2015	0.196 D5	02/16/2016	10.4	1.0	0	10.4	0.120 S	10.4	06/08/2023	02/15/2017
8.01	END CAP	N	0.206 RP	06/25/2014	0.198	01/25/2015	0.198 RR	02/16/2016	0	4.9	4.3	18.4	0.120 S	4.9	01/17/2032	02/15/2017
9.01	STR-T	Y *	0.235 RP	06/25/2014	0.229	01/25/2015	0.208 D5	02/16/2016	19.8	16.4	16.8	19.8	0.120 S	19.8	07/27/2020	02/15/2017
9.02	STR-B	N	0.230 RP	06/25/2014	0.230 RR	01/25/2015	0.226 D5	02/16/2016	3.8	2.4	2.6	25.9	0.120 S	3.8	01/09/2044	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: WATER OUT
 Eq Type: PIPING
 Class: 2
 CM RBL:
 Design Code: B31.3

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

Description: WATER OUT-3 INCH SCH80 PIPE

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 20.0 MPY
 Pred. Ret. Date = 08/06/2019 Rem. Life (from last survey 02/16/2016) = 3.5 yrs

Ø C.A. Status: No
 Total Caution IMLS = 10

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
10.01	STR-T	N	0.198 RP	01/26/2012	0.200	01/25/2015	0.200 RR	02/16/2016	0	0	0	10.2	0.120 S	0.1	02/22/2016	02/15/2017
10.02	STR-B	N	0.199 RP	01/26/2012	0.192	01/25/2015	0.192 RR	02/16/2016	0	1.7	1.9	4.7	0.120 S	1.7	06/24/2058	02/15/2017
11.01	TEE-TOP	N	0.304	01/26/2012	0.315	01/25/2015	0.302 D5	02/16/2016	12.3	0.5	0	12.3	0.120 S	12.3	12/04/2030	02/15/2017
11.02	TEE-BK	Y	0.356	01/26/2012	0.342	01/25/2015	0.307 D5	02/16/2016	33.0	12.1	10.1	33.0	0.120 S	33.0	10/17/2021	02/15/2017
11.03	TEE-BTM	Y	0.280	01/26/2012	0.320 RR	01/25/2015	0.290 D5	02/16/2016	28.3	0	0	28.3	0.120 S	28.3	02/18/2022	02/15/2017
12.01	STR-T	N *	0.210	02/14/2012		N/A	0.204	07/18/2012	N/A	14.1	N/A	14.1	0.120 S	14.1	07/03/2018	07/18/2013
12.02	STR-B	N	0.211	02/14/2012	0.203	07/18/2012	0.203	06/18/2013	0	6.0	5.0	18.9	0.120 S	6.0	04/19/2027	06/18/2014
13.01	END CAP	N	0.199	01/26/2012	0.192	01/25/2015	0.192 RR	02/16/2016	0	1.7	2.4	22.2	0.120 S	1.7	06/24/2058	02/15/2017
14.01	TEE-T	N	0.210 RP	07/18/2012	0.200	06/25/2014	0.200 RR	02/16/2016	0	2.8	2.6	14.2	0.114 P	2.8	10/11/2046	02/15/2017
14.02	TEE-F	N		N/A		N/A	0.335 D5	02/16/2016	N/A	N/A	N/A	0	0.114 P	0.1	03/02/4016	02/15/2017
14.03	TEE-BT	N		N/A		N/A	0.307 D5	02/16/2016	N/A	N/A	N/A	0	0.114 P	0.1	05/04/3944	02/15/2017
15.01	STR-T	N	0.202 RP	07/18/2012	0.225	01/25/2015	0.225 RR	02/16/2016	0	0	0	5.8	0.120 S	0.1	02/24/3066	02/15/2017
15.02	STR-B	N	0.201 RP	07/18/2012	0.232	01/25/2015	0.232 RR	02/16/2016	0	0	0	30.5	0.120 S	0.1	02/25/3136	02/15/2017
16.01	TEE-L	N	0.460	02/14/2012	0.419 RR	01/25/2015	0.423 RR	02/16/2016	0	9.2	6.3	87.2	0.216 P	9.2	08/03/2038	02/15/2017
16.02	TEE-B	N	0.449	02/14/2012	0.443	01/25/2015	0.443 RR	02/16/2016	0	1.5	2.0	6.9	0.216 P	1.5	03/26/2167	02/15/2017
16.03	TEE-R	Y	0.501	02/14/2012	0.410 RR	01/25/2015	0.399 D5	02/16/2016	10.4	25.5	18.4	176.7	0.216 P	25.5	04/16/2023	02/15/2017
17.01	RED-T	N	0.457	02/14/2012	0.456	01/25/2015	0.451 D5	02/16/2016	4.7	1.5	1.2	4.7	0.216 P	4.7	01/20/2066	02/15/2017
17.02	RED-R	Y	0.480	02/14/2012	0.425	01/25/2015	0.401 D5	02/16/2016	22.7	19.7	14.1	110.8	0.216 P	22.7	04/05/2024	02/15/2017
17.03	RED-B	N	0.462	02/14/2012	0.458	01/25/2015	0.444 D5	02/16/2016	13.2	4.5	2.3	25.9	0.216 P	13.2	05/16/2033	02/15/2017
17.04	RED-L	Y	0.466	02/14/2012	0.440	01/25/2015	0.423 D5	02/16/2016	16.0	10.7	9.0	25.9	0.216 P	16.0	01/16/2029	02/15/2017
18.01	TEE-T	N	0.352 RP	02/01/2011	0.320	01/25/2015	0.312 D5	02/16/2016	7.6	7.9	9.0	21.8	0.114 P	7.9	03/02/2041	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: WATER OUT
 Eq Type: PIPING
 Class: 2
 CM RBL:
 Design Code: B31.3

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

Description: WATER OUT-3 INCH SCH80 PIPE

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 08/06/2019

Group Description:
 RCR = 20.0 MPY
 Rem. Life (from last survey 02/16/2016) = 3.5 yrs

Ø C.A. Status: No
 Total Caution IMLS = 10

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
18.02	TEE-R	N		N/A		N/A	0.344 D5	02/16/2016	N/A	N/A	N/A	0	0.114 P	0.1	03/02/4016	02/15/2017
18.03	TEE-BT	N		N/A		N/A	0.260 D5	02/16/2016	N/A	N/A	N/A	0	0.114 P	0.1	05/01/3474	02/15/2017
19.01	END CAP	N	0.235 RP	02/01/2011	0.188	01/25/2015	0.182 D5	02/16/2016	5.7	10.5	5.5	51.4	0.120 S	10.5	01/12/2022	02/15/2017
20.01	TEE-T	N	0.382	07/18/2012	0.372	01/25/2015	0.365 D5	02/16/2016	6.6	4.7	3.7	13.1	0.120 S	6.6	04/01/2053	02/15/2017
20.02	TEE-L	Y	0.420	07/18/2012	0.355 RR	01/25/2015	0.356 RR	02/16/2016	0	17.9	15.1	68.7	0.120 S	17.9	04/24/2029	02/15/2017
20.03	TEE-BT	N	0.341	07/18/2012	0.351	01/25/2015	0.351 RR	02/16/2016	0	0	0	0	0.120 S	0.1	03/02/4016	02/15/2017
21.01	STR-T	N	0.226	04/05/2006	0.218	01/25/2015	0.218 D5	02/16/2016	0	0.8	1.2	21.2	0.120 S	0.8	08/18/2138	02/15/2017
21.02	STR-B	N	0.220	04/05/2006	0.209	01/25/2015	0.206 D5	02/16/2016	2.8	1.4	0.6	40.1	0.120 S	2.8	11/03/2046	02/15/2017
22.01	TEE-TOP	N	0.385 RP	02/14/2012	0.323 RR	01/25/2015	0.328 RR	02/16/2016	0	14.2	14.3	54.2	0.120 S	14.2	10/10/2030	02/15/2017
22.02	TEE-BK	N	0.426 RP	02/14/2012	0.412 RR	01/25/2015	0.414 D5	02/16/2016	0	3.0	2.3	23.6	0.120 S	3.0	02/17/2114	02/15/2017
22.03	TEE-BTM	N	0.383 RP	02/14/2012	0.345 RR	01/25/2015	0.347 RR	02/16/2016	0	9.0	1.8	143.7	0.120 S	9.0	05/07/2041	02/15/2017
23.01	END CAP	N	0.208 RP	02/14/2012	0.175	01/25/2015	0.175 RR	02/16/2016	0	8.2	6.6	51.8	0.120 S	8.2	11/01/2022	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: WATER OUT
 Design Code: B31.3
 Eq Type: PIPING
 Class: 2
 CM RBI:

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

Description: WATER OUT-3 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	:	8.4 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	20.0 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	9.9 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 20.0 MPY

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

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

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

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

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

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

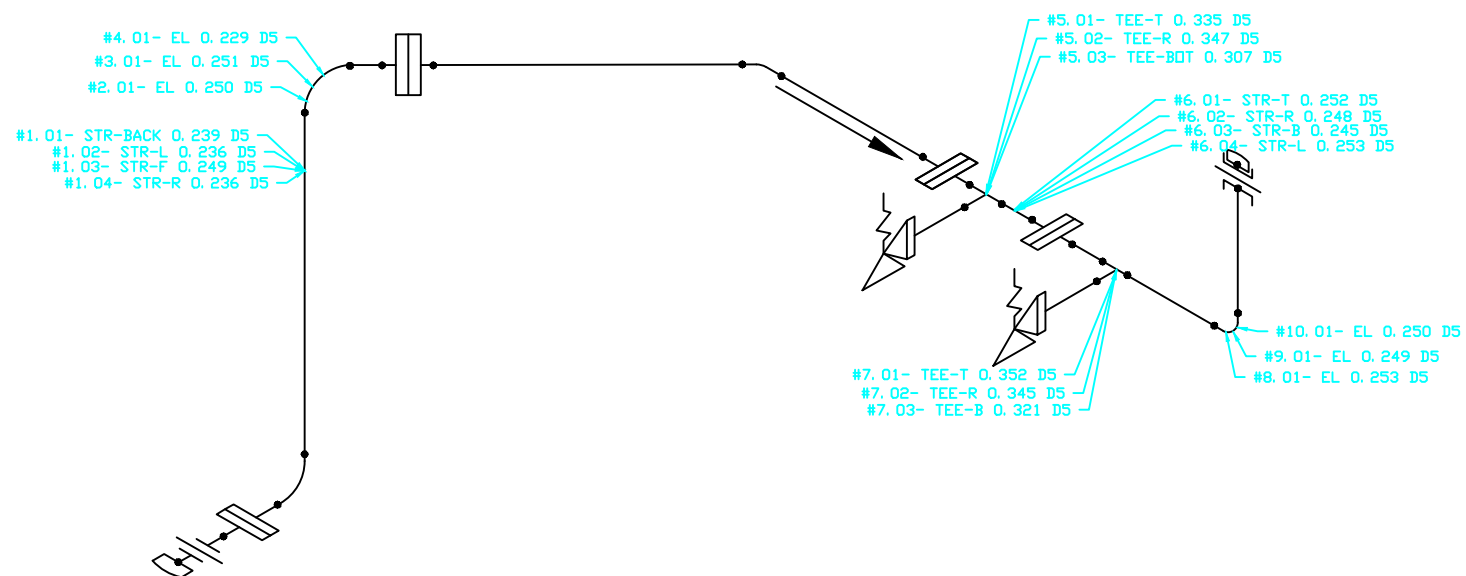
Eq/Circ ID Estimated life = 3.5 years from the most recent survey date.
 (Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 08/06/2019

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
 UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
 There are 10 Caution TMLs in this Eq/Circ ID.

EQUIP RETIREMENT DATE: 7/16/2041
NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P4

DA-512

DESC: RELIEF LINE-4 INCH SCH40 PIPE
DWG#: RELIEF-1.01-10.01

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: RELIEF
 Eq Type: PIPING
 Class: 2
 CM RBL:
 Design Code: B31.3

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

Description: RELIEF LINE-4 INCH SCH40 PIPE

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 7.4 MPY
 Pred. Ret. Date = 07/16/2041 Rem. Life (from last survey 02/16/2016) = 25.4 yrs

0 C.A. Status: NO
 Total Caution IMLS = 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-BACK	N *	0.246	04/05/2006	0.249	01/25/2015	0.239 D5	02/16/2016	9.4	0.7	0.5	11.2	0.150 S	9.4	08/05/2025	02/15/2017
1.02	STR-L	N *	0.235	04/05/2006	0.239	01/25/2015	0.236 D5	02/16/2016	2.8	0	0	9.2	0.150 I	2.8	11/03/2046	02/15/2017
1.03	STR-F	N	0.237	04/05/2006	0.238	01/25/2015	0.238 RR	02/16/2016	0	0	0	4.2	0.150 I	0.1	02/22/2896	02/15/2017
1.04	STR-R	N *	0.236	04/05/2006	0.240	01/25/2015	0.236 D5	02/16/2016	3.8	0	0	6.1	0.150 I	3.8	10/04/2038	02/15/2017
2.01	EL	N	0.230	04/05/2006	0.231	01/25/2015	0.231 RR	02/16/2016	0	0	0.1	3.1	0.150 I	0.1	02/22/2826	02/15/2017
3.01	EL	N	0.240	04/05/2006	0.241 RR	01/25/2015	0.242 RR	02/16/2016	0	0	0	10.2	0.150 I	0.1	02/23/2936	02/15/2017
4.01	EL	N *	0.244	04/05/2006	0.244	01/25/2015	0.229 D5	02/16/2016	14.2	1.5	0.8	14.2	0.150 I	14.2	09/09/2021	02/15/2017
5.01	TEE-T	N *	0.323	04/05/2006	0.342 RR	01/25/2015	0.335 D5	02/16/2016	6.6	0	0	11.2	0.150 I	6.6	02/27/2044	02/15/2017
5.02	TEE-R	N	0.342	04/05/2006	0.341	01/25/2015	0.341 RR	02/16/2016	0	0.1	0	6.8	0.150 I	0.1	03/03/3926	02/15/2017
5.03	TEE-BUT	N *	0.300	04/05/2006	0.310 RR	01/25/2015	0.307 D5	02/16/2016	2.8	0	0	2.8	0.150 I	2.8	03/13/2072	02/15/2017
6.01	STR-T	N	0.239	04/05/2006	0.252 RR	06/18/2013	0.252 D5	02/16/2016	0	0	0	10.2	0.150 I	0.1	02/24/3036	02/15/2017
6.02	STR-R	N	0.243	04/05/2006	0.247 RR	06/18/2013	0.248 D5	02/16/2016	0	0	0	8.1	0.150 I	0.1	02/23/2996	02/15/2017
6.03	STR-B	N	0.248	04/05/2006	0.245 RR	06/18/2013	0.245 D5	02/16/2016	0	0.3	0.6	8.1	0.150 I	0.3	10/20/2332	02/15/2017
6.04	STR-L	N	0.243	04/05/2006	0.250	06/18/2013	0.250 RR	02/16/2016	0	0	0	11.2	0.150 I	0.1	02/24/3016	02/15/2017
7.01	TEE-T	N	0.340	04/05/2006	0.350	01/25/2015	0.350 RR	02/16/2016	0	0	0	8.1	0.150 I	0.1	03/02/4016	02/15/2017
7.02	TEE-R	N	0.338	04/05/2006	0.348 RR	01/25/2015	0.345 D5	02/16/2016	2.8	0	0	6.1	0.150 I	2.8	10/08/2085	02/15/2017
7.03	TEE-B	N	0.331	04/05/2006	0.321	01/25/2015	0.321 D5	02/16/2016	0	1.0	1.5	14.2	0.150 I	1.0	02/17/2187	02/15/2017
8.01	EL	N	0.243	04/05/2006	0.246 RR	06/18/2013	0.248 RR	02/16/2016	0	0	0	14.2	0.150 I	0.1	02/23/2996	02/15/2017
9.01	EL	N	0.250	04/05/2006	0.248	06/18/2013	0.248 RR	02/16/2016	0	0.2	0.3	8.1	0.150 I	0.2	02/20/2506	02/15/2017
10.01	EL	N	0.242	04/05/2006	0.250	06/18/2013	0.250 D5	02/16/2016	0	0	0	3.1	0.150 I	0.1	02/24/3016	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
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: RELIEF LINE-4 INCH SCH40 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	:	2.2 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	7.4 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	2.8 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 7.4 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).

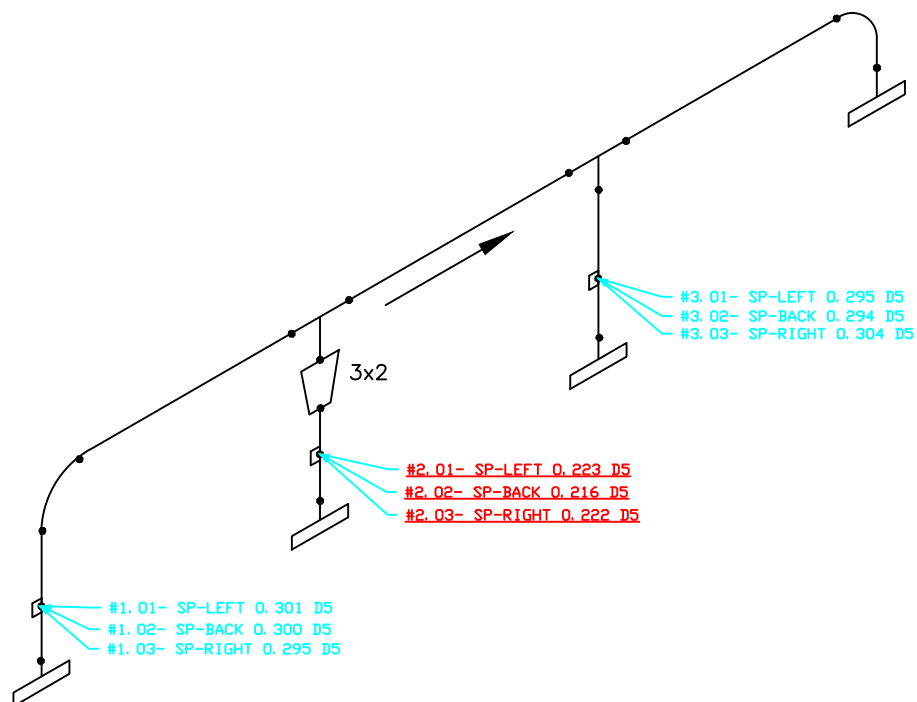
Eq/Circ ID Estimated life = 25.4 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 07/16/2041

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
UT/RT Inspection Interval is 1.00 years.

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

EQUIP RETIREMENT DATE: 12/7/2277
NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P5

FH2E-D

DESC: HEADER PIPING-3 INCH SCH80 PIPE
DWG#: HEADER-SP-1.01-3.03

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

(report in inches, corrosion rates in MPY)
 Analysis: Straight Line

Unit: HS-0028
 Eq/Circ ID: HEADER-SP
 Eq Type: PIPING
 Class:
 CM RBL:
 Design Code: B31.3

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

Description: HEADER PIPING-3 INCH SCH80 PIPE
 READINGS AT INJECTION PORTS

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 12/07/2217

Group Description:
 RCR = 48.1 MPY
 Rem. Life (from last survey 02/16/2016) = 261.8 yrs

0 C.A. Status: NO
 Total Caution IMLs = 3

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	SP-LEFT	N	0.287	06/18/2013	0.289	01/25/2015	0.289 RR	02/16/2016	0	0	0	0	0.160 P	0.1	07/07/3304	02/15/2017
1.02	SP-BACK	N *	0.290	06/18/2013	0.289	01/25/2015	0.289 RR	02/16/2016	0	0.4	0.4	1.7	0.160 P	0.4	03/24/2338	02/15/2017
1.03	SP-RIGHT	N *	0.269 DC	06/18/2013	0.263	01/25/2015	0.263 RR	02/16/2016	0	2.3	2.3	3.9	0.160 P	2.3	11/02/2060	02/15/2017
2.01	SP-LEFT	Y *	0.256	06/18/2013	0.261	01/25/2015	0.223 D5	02/16/2016	35.9	12.4	11.5	35.9	0.109 P	35.9	04/24/2019	02/15/2017
2.02	SP-BACK	Y *	0.277	06/18/2013	0.270	01/25/2015	0.216 D5	02/16/2016	51.0	22.9	22.5	51.0	0.160 P	51.0	03/22/2017	02/15/2017
2.03	SP-RIGHT	Y *	0.280	06/18/2013	0.270	01/25/2015	0.222 D5	02/16/2016	45.3	21.8	21.4	45.3	0.160 P	45.3	06/29/2017	02/15/2017
3.01	SP-LEFT	N *	0.280	06/18/2013	0.280	01/25/2015	0.280 RR	02/16/2016	0	0	0	0	0.160 P	0.1	07/07/3214	02/15/2017
3.02	SP-BACK	N *	0.280	06/18/2013	0.280	01/25/2015	0.280 RR	02/16/2016	0	0	0	0	0.160 P	0.1	07/07/3214	02/15/2017
3.03	SP-RIGHT	N *	0.275	06/18/2013	0.280	01/25/2015	0.280 RR	02/16/2016	0	0	0	0	0.160 P	0.1	07/07/3214	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HEADER-SP
 Design Code: B31.3
 Eq Type: PIPING
 Class:
 CM RBI:

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

Description: HEADER PIPING-3 INCH SCH80 PIPE
 READINGS AT INJECTION PORTS

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	:	15.0 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	48.1 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	21.4 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 48.1 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 6 months.

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

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

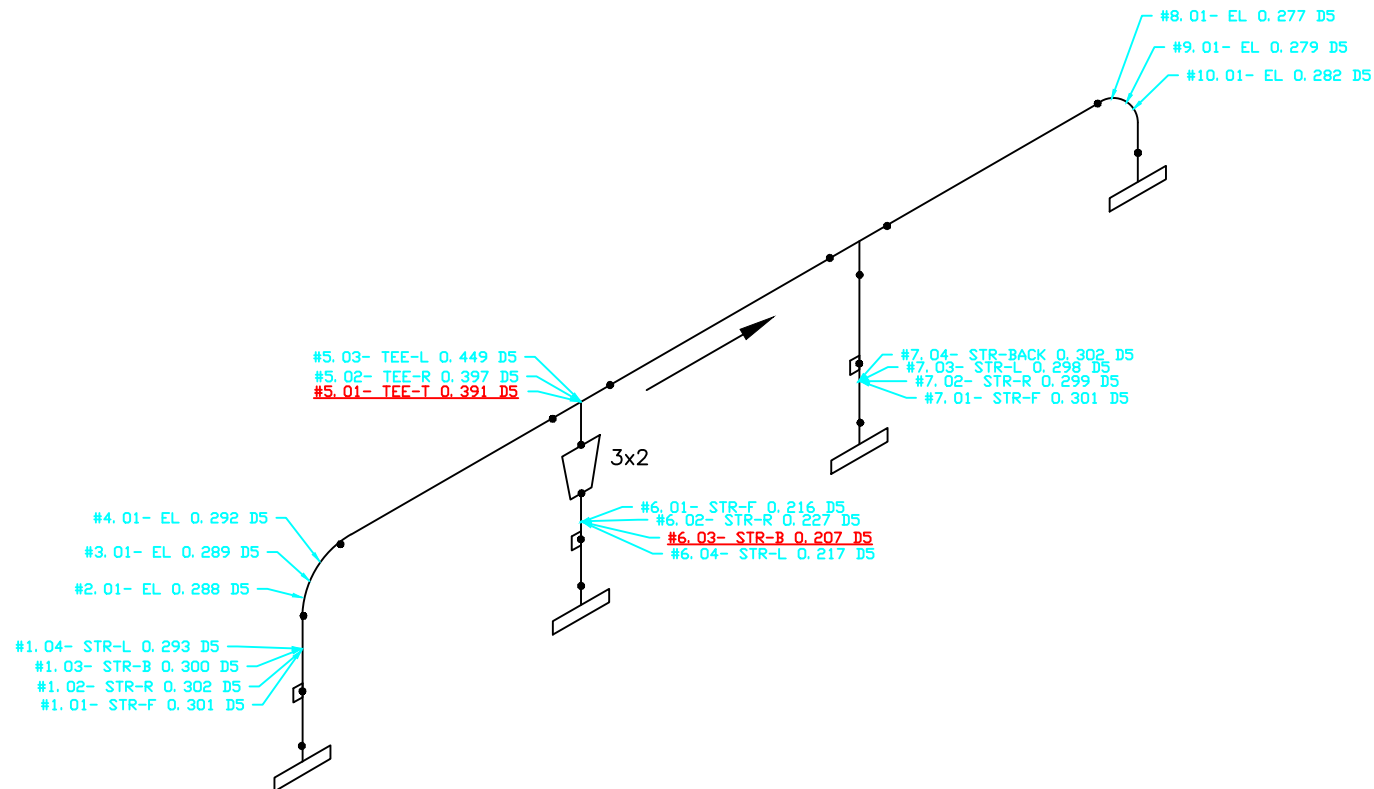
Eq/Circ ID Estimated life = 261.8 years from the most recent survey date.
 (Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 12/07/2277

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
 UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
 There are 3 Caution TMLs in this Eq/Circ ID.

EQUIP RETIREMENT DATE: 5/10/2031
NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P5

DA-512

DESC: HEADER PIPING-3 INCH SCH80 PIPE
DWG#: HEADER-1.01-10.01

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date:06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: HEADER
 Eq Type: PIPING
 Class: 2
 CM RBL:
 Design Code: B31.3

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

Description: HEADER PIPING-3 & 2 INCH SCH80 PIPE

Summary: Group Name: Group Description:
 Insp. Due Date = 02/15/2017 RCR = 18.1 MPY
 Pred. Ret. Date = 05/10/2031 Rem. Life (from last survey 02/16/2016) = 15.2 yrs

0 C.A. Status: NO
 Total Caution IMLS = 2

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	0.304	04/05/2006	0.296	01/25/2015	0.296 RR	02/16/2016	0	0.8	0.3	2.4	0.168 P	0.8	10/17/2175	02/15/2017
1.02	STR-R	N *	0.300	04/05/2006	0.244	01/25/2015	0.244 RR	02/16/2016	0	5.7	6.1	45.2	0.208 P	5.7	05/20/2022	02/15/2017
1.03	STR-B	N	0.306	04/05/2006	0.296 RR	01/25/2015	0.297 RR	02/16/2016	0	0.9	0.4	4.9	0.208 P	0.9	08/25/2114	02/15/2017
1.04	STR-L	N	0.301	04/05/2006	0.295	01/25/2015	0.293 D5	02/16/2016	1.9	0.8	1.0	4.1	0.208 P	1.9	09/08/2060	02/15/2017
2.01	EL	N *	0.298	04/05/2006	0.293	01/25/2015	0.288 D5	02/16/2016	4.7	1.0	0.7	7.1	0.208 P	4.7	01/28/2033	02/15/2017
3.01	EL	N *	0.302	04/05/2006	0.292	01/25/2015	0.289 D5	02/16/2016	2.8	1.3	0.9	3.1	0.208 P	2.8	12/08/2044	02/15/2017
4.01	EL	N	0.296	04/05/2006	0.280	01/25/2015	0.280 RR	02/16/2016	0	1.6	1.4	11.9	0.208 P	1.6	12/01/2060	02/15/2017
5.01	TEE-T	Y *	0.455	04/05/2006	0.456	01/25/2015	0.391 D5	02/16/2016	61.3	6.5	3.2	61.3	0.208 P	61.3	02/08/2019	02/15/2017
5.02	TEE-R	N	0.364	04/05/2006	0.307 RR	01/25/2015	0.328 RR	02/16/2016	0	3.6	4.6	75.6	0.208 P	3.6	05/14/2049	02/15/2017
5.03	TEE-L	N	0.383	04/05/2006	0.400	01/25/2015	0.400 RR	02/16/2016	0	0	0	0	0.208 P	0.1	11/01/3932	02/15/2017
6.01	STR-F	N	0.220	04/05/2006	0.218	01/25/2015	0.216 D5	02/16/2016	1.9	0.4	0.6	6.1	0.141 P	1.9	05/29/2055	02/15/2017
6.02	STR-R	N	0.228	04/05/2006	0.217	01/25/2015	0.217 RR	02/16/2016	0	1.1	0.1	3.4	0.141 P	1.1	11/18/2084	02/15/2017
6.03	STR-B	Y *	0.220	04/05/2006	0.223 RR	01/25/2015	0.207 D5	02/16/2016	15.1	1.3	1.3	15.1	0.141 P	15.1	06/22/2020	02/15/2017
6.04	STR-L	N	0.238	04/05/2006	0.219	01/25/2015	0.217 D5	02/16/2016	1.9	2.1	1.6	4.6	0.141 P	2.1	02/21/2052	02/15/2017
7.01	STR-F	N	0.304	04/05/2006	0.300	01/25/2015	0.300 RR	02/16/2016	0	0.4	0.5	6.1	0.208 P	0.4	04/19/2245	02/15/2017
7.02	STR-R	N	0.303	04/05/2006	0.301	01/25/2015	0.299 D5	02/16/2016	1.9	0.4	0	2.0	0.208 P	1.9	11/05/2063	02/15/2017
7.03	STR-L	N *	0.306	04/05/2006	0.301	01/25/2015	0.298 D5	02/16/2016	2.8	0.8	0.2	2.8	0.208 P	2.8	02/25/2048	02/15/2017
7.04	STR-BACK	N	0.299	04/05/2006	0.294	01/25/2015	0.294 RR	02/16/2016	0	0.5	0.6	7.9	0.208 P	0.5	06/18/2187	02/15/2017
8.01	EL	N	0.277	04/05/2006	0.275 RR	01/25/2015	0.277 D5	02/16/2016	0	0	0.3	6.1	0.208 P	0.1	10/23/2702	02/15/2017
9.01	EL	N	0.292	04/05/2006	0.277	01/25/2015	0.277 RR	02/16/2016	0	1.5	1.2	8.1	0.208 P	1.5	11/26/2061	02/15/2017

10.01	EL	N	0.294	04/05/2006	0.279	01/25/2015	0.279 RR	02/16/2016	0	1.5	1.1	8.1	0.208	P	1.5	03/28/2063	02/15/2017
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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: 06/22/2016

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

Unit: HS-0028
Eq/Circ ID: HEADER
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: HEADER PIPING-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	:	5.3 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	18.1 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	6.8 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 18.1 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).

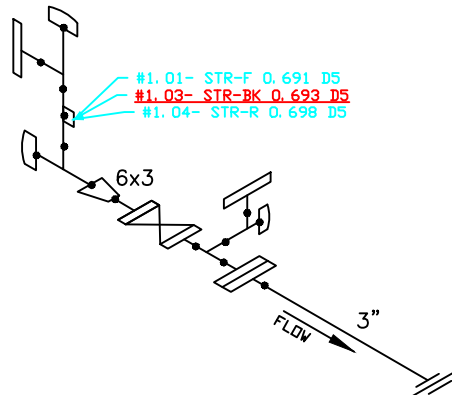
Eq/Circ ID Estimated life = 15.2 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 05/10/2031

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
There are 2 Caution TMLs in this Eq/Circ ID.

EQUIP RETIREMENT DATE: 3/7/2077
NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P6

DA-512

DESC: 3,6 INCH SCH160 PIPE-GAS IN
DWG#: GAS-INLET-SP-1.01-1.04

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: GAS INLET-SP
 Eq Type: PIPING
 Class: 2
 CM RBL:
 Design Code: B31.3

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

Description: 3.6 INCH GAS INLET LINE
 (MANIFOLD GONE)

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 03/07/2017

Group Description:
 RCR = 19.1 MPY
 Rem. Life (from last survey 02/16/2016) = 61.0 yrs

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

TML No	Location	Ctn TML	First Survey Thick Nt	First Date	Previous Survey Thick Nt	Previous Date	Last Survey Thick Nt	Last Date	Shrt Term Rate	Long Term Rate	Best Rate	Max Hist CR	Retirement Thickness	Rep TML CR	TML Retirement Date	TML Inspection Date
1.01	STR-F	N *	0.694	01/25/2015		N/A	0.691 D5	02/16/2016	N/A	2.8	N/A	15.5	0.319 P	2.8	02/28/2149	02/15/2017
1.03	STR-BK	Y *	0.710	01/25/2015		N/A	0.693 D5	02/16/2016	N/A	16.0	N/A	16.0	0.319 P	16.0	07/14/2039	02/15/2017
1.04	STR-R	N *	0.713	01/25/2015		N/A	0.698 D5	02/16/2016	N/A	14.2	N/A	14.2	0.319 P	14.2	11/07/2042	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
Eq/Circ ID: GAS INLET-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: 3,6 INCH GAS INLET LINE
(MANIFOLD GONE)

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	:	11.0 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	15.1 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	19.1 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 19.1 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).

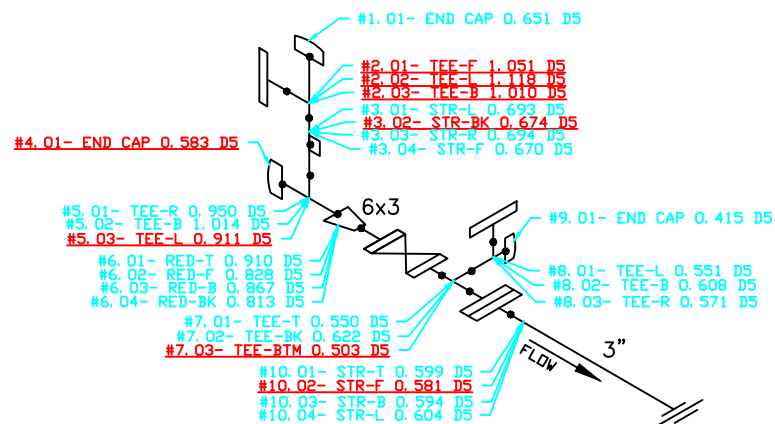
Eq/Circ ID Estimated life = 61.0 years from the most recent survey date.
(Estimated Life based on the ave of the earliest 0% (Min 6) TML retirement dates.)

Predicted Eq/Circ ID Retirement date is 03/07/2077

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
UT/RT Inspection Interval is 1.00 years.

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

EQUIP RETIREMENT DATE: 11/24/2025
NEXT INSPECTION IS DUE: 2/15/2017



HS0028-P6

DA-512

DESC: INLET MANIFOLD-6 AND 3 INCH SCH160 PIPE
DWG#: GAS-INLET-1.01-10.04

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: GAS INLET
 Eq Type: PIPING
 Class: 2
 CM RBL:
 Design Code: B31.3

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

Description: 3.6 INCH GAS INLET LINE
 (MANIFOLD GUNE)

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 11/24/2025

Group Description:
 RCR = 43.4 MPY
 Rem. Life (from last survey 02/16/2016) = 9.8 yrs

0 C.A. Status: NO
 Total Caution IMLS = 8

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	END CAP	N	0.681	04/05/2006	0.640 RR	01/25/2015	0.641 RR	02/16/2016	0	4.1	5.0	15.5	0.319 P	4.1	10/13/2094	02/15/2017
2.01	TEE-F	Y	1.062	02/14/2012	0.997	01/25/2015	0.997 RR	02/16/2016	0	16.2	19.8	55.1	0.319 P	16.2	01/03/2058	02/15/2017
2.02	TEE-L	Y	1.130	02/14/2012	1.134 RR	01/25/2015	1.118 D5	02/16/2016	15.1	3.0	1.6	15.1	0.319 P	15.1	01/27/2069	02/15/2017
2.03	TEE-B	Y *	1.060	02/14/2012	1.047	01/25/2015	1.010 D5	02/16/2016	34.9	12.5	5.2	101.3	0.319 P	34.9	12/10/2035	02/15/2017
3.01	STR-L	N	0.735	04/05/2006	0.701 RR	01/25/2015	0.693 D5	02/16/2016	7.6	4.3	5.3	24.0	0.319 P	7.6	05/27/2065	02/15/2017
3.02	STR-BK	Y *	0.720	04/05/2006	0.705	01/25/2015	0.674 D5	02/16/2016	29.3	4.7	4.2	29.3	0.319 P	29.3	04/04/2028	02/15/2017
3.03	STR-R	N	0.707	04/05/2006	0.691	01/25/2015	0.691 RR	02/16/2016	0	1.6	2.0	13.1	0.319 P	1.6	12/09/2248	02/15/2017
3.04	STR-F	N	0.705	04/05/2006	0.674 RR	01/25/2015	0.670 D5	02/16/2016	3.8	3.5	4.1	6.8	0.319 P	3.8	08/17/2108	02/15/2017
4.01	END CAP	Y *	0.632	04/05/2006	0.290	01/25/2015	0.290 RR	02/16/2016	0	34.7	37.9	164.8	0.319 P	34.7	04/22/2015	02/15/2017
5.01	TEE-R	N	0.973	04/05/2006	0.927	01/25/2015	0.927 RR	02/16/2016	0	4.7	5.4	33.5	0.319 P	4.7	08/05/2145	02/15/2017
5.02	TEE-B	N	1.087	04/05/2006	1.000	01/25/2015	1.000 RR	02/16/2016	0	8.8	10.4	39.1	0.319 P	8.8	07/27/2093	02/15/2017
5.03	TEE-L	Y *	0.962	04/05/2006	0.980	01/25/2015	0.911 D5	02/16/2016	65.1	5.2	2.7	65.1	0.319 P	65.1	03/24/2025	02/15/2017
6.01	RED-T	N	0.837	02/14/2012	0.823	01/25/2015	0.823 RR	02/16/2016	0	3.5	0.3	70.7	0.319 P	3.5	04/08/2160	02/15/2017
6.02	RED-F	N	0.805	02/14/2012	0.804	01/25/2015	0.804 RR	02/16/2016	0	0.2	0.3	4.4	0.319 P	0.2	03/02/4016	02/15/2017
6.03	RED-B	N	0.808	02/14/2012	0.775 RR	01/25/2015	0.780 RR	02/16/2016	0	7.0	8.8	24.6	0.319 P	7.0	01/20/2082	02/15/2017
6.04	RED-BK	N	0.781	02/14/2012	0.802	01/25/2015	0.802 RR	02/16/2016	0	0	0	16.5	0.319 P	0.1	03/02/4016	02/15/2017
7.01	TEE-T	N	0.571	02/14/2012	0.542 RR	01/25/2015	0.549 RR	02/16/2016	0	5.5	7.3	24.6	0.168 P	5.5	05/08/2085	02/15/2017
7.02	TEE-BK	N	0.631	02/14/2012	0.623	01/25/2015	0.622 D5	02/16/2016	0.9	2.2	1.1	23.6	0.168 P	2.2	05/17/2222	02/15/2017
7.03	TEE-BTM	Y *	0.592	02/14/2012	0.572	01/25/2015	0.503 D5	02/16/2016	65.1	22.2	17.4	65.1	0.168 P	65.1	04/08/2021	02/15/2017
8.01	TEE-L	N	0.543	02/14/2012	0.535 RR	01/25/2015	0.536 RR	02/16/2016	0	1.7	2.4	8.9	0.168 P	1.7	06/11/2232	02/15/2017

Corrosion Monitoring Eq/Circ ID Analysis Report

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: GAS INLET
 Eq Type: PIPING
 Class: 2
 CM RBL:
 Design Code: B31.3

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

Description: 3,6 INCH GAS INLET LINE
 (MANIFOLD GONE)

Summary: Group Name:
 Insp. Due Date = 02/15/2017
 Pred. Ret. Date = 11/24/2025

Group Description:
 RCR = 43.4 MPY
 Rem. Life (from last survey 02/16/2016) = 9.8 yrs

Ø C.A. Status: No
 Total Caution IMLS = 8

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
8.02	TEE-B	N	0.658	02/14/2012	0.606	01/25/2015	0.606 RR	02/16/2016	0	13.0	13.2	39.3	0.168 P	13.0	10/19/2049	02/15/2017
8.03	TEE-R	N	0.577	02/14/2012	0.551	01/25/2015	0.551 RR	02/16/2016	0	6.5	6.8	25.1	0.168 P	6.5	01/04/2075	02/15/2017
9.01	END CAP	N	0.447	04/05/2006	0.405	01/25/2015	0.405 RR	02/16/2016	0	4.3	4.0	22.2	0.168 P	4.3	03/07/2071	02/15/2017
10.01	STR-T	N	0.632 RP	04/08/2009	0.610	01/25/2015	0.599 D5	02/16/2016	10.4	4.8	4.0	12.6	0.168 P	10.4	07/17/2057	02/15/2017
10.02	STR-F	Y *	0.626 RP	04/08/2009	0.614	01/25/2015	0.581 D5	02/16/2016	31.1	6.6	3.6	31.1	0.168 P	31.1	05/25/2029	02/15/2017
10.03	STR-B	N	0.622 RP	04/08/2009	0.600	01/25/2015	0.594 D5	02/16/2016	5.7	4.1	4.2	14.5	0.168 P	5.7	10/25/2090	02/15/2017
10.04	STR-L	N	0.633 RP	04/08/2009	0.615	01/25/2015	0.604 D5	02/16/2016	10.4	4.2	3.5	14.5	0.168 P	10.4	01/09/2058	02/15/2017

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

Report Date: 06/22/2016

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

Unit: HS-0028
 Eq/Circ ID: GAS INLET
 Design Code: B31.3
 Eq Type: PIPING
 Class: 2
 CM RBI:

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

Description: 3,6 INCH GAS INLET LINE
 (MANIFOLD GONE)

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	:	14.5 MPY
(B) -- Average Max 25.0% of TMLs, Min of 2	:	43.4 MPY
(C) -- Formula Corrosion Rate (Sigma = 1.28)	:	18.1 MPY
(D) -- Default Corrosion Rate	:	0.1 MPY

Representative Corrosion Rate = 43.4 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 = 9.8 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 11/24/2025

Recommended Eq/Circ UT/RT Inspection Date is 02/15/2017
 UT/RT Inspection Interval is 1.00 years.

Caution TML Logic: TML Corrosion Rate > 15.0 MPY .OR. TML Remaining Life < 3.00 Years.
 There are 8 Caution TMLs in this Eq/Circ ID.