

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

A403347620

FACILITY: The Dow Chemical Company U.S.A., Midland		SRN / ID: A4033
LOCATION: 1790 Building, MIDLAND		DISTRICT: Saginaw Bay
CITY: MIDLAND		COUNTY: MIDLAND
CONTACT: Jennifer Kraut ,		ACTIVITY DATE: 01/16/2019
STAFF: Kathy Brewer	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MEGASITE
SUBJECT: EU86-S1; EU91-S1		
RESOLVED COMPLAINTS:		

Dow Chemical EU91-S1 and EU86-S1 Inspection Partial FCE for A4033 January 16, 2019

The facility contact for the inspection is Jenny Kraut, Air Specialist, Dow Chemical

EU91-S1

The EU91-S2 process is the storage and distribution of 1,3-butadiene. It consists of a 430,000 gallon spherical 1,3-butadiene (Buta) storage tank and a railcar transfer system.

This emission unit was permitted in PTI 188-89A in 2004 and rolled into the ROP in 2009. EU91-S1 is subject to the requirements of 40 CFR Part 63, Subparts A, U, and EEEE and the equipment leak provisions of Subpart H.

During the inspection we reviewed the Butadiene storage railcar transfer system and associated emission control devices, monitoring, and ROP required records.

All areas evaluated indicate the facility is in compliance with the requirements of MI-ROP-A4033-2017b, EU91-S1.

ATTACHMENTS

EU91-S1 process flow diagram

Operations record example from Dec. 2016, June 2017; Butadiene Sphere pressures

12 Month Rolling Emissions November 2017, November 2018

FILES REVIEWED

40 CFR Part 63 Subpart U, Semi annual report September 2018 (submitted by Trinseo under EUB1-S2)

ROP Semi Annual Deviation Reports September 2017 through September 2018

Release Reports September 2017 – November 2018

Saginaw Bay AQD PTI 188-89A application and permit file

EU91-S1: Compliant

The process uses a closed loop vapor return control system that allows material transfer without filling losses. Nitrogen purge is used for transfers to the storage sphere. The process does perform railcar offloading most everyday. EU91-S1 vents are directed to the 954 THROX only during periods of Buta sphere maintenance.

Emission limits

The following limits apply to EU91-S1

Pollutant	Limit	Time Period/ Operating Scenario	Equipment
1. 1,3 Butadiene	20 lbs/yr	12-month rolling time period as determined at the end of each calendar month	Storage sphere railcar disconnection, filter change, and sampling. Under normal operation there are no emissions from the storage sphere except during railcar disconnection, filter change, and sampling.
2. 1,3 Butadiene	36 lbs/month	30-day consecutive time period	Storage sphere preparation for maintenance (i.e., emissions from stack No. SV954THROX)

SC I. 1. I reviewed example calculations for November 2017 and November 2018. The emissions are based on number of railcar disconnects each month. The transfer system has interlocks that require nitrogen purge is activated before disconnect. Even though purge with nitrogen before disconnect, it is assumed 0.033 lbs of 1,3 Butadiene are emitted per disconnect.

Records review indicate that the facility is in compliance with 1,3 Butadiene 12 month rolling limit of 20 lbs/year.

Date	12 month Total – not rolling 1,3 Butadiene (lbs)	Monthly TOTAL emissions 1,3 Butadiene (lbs)
Dec 2017	9.933	0.693
Dec 2018	10.6	0.726
June 2018	-	0.858
June 2017	-	0.792
Nov 2017	-	0.627
Nov 2018	-	0.759

SC I.2 It has been more than 5 years since any maintenance was performed on the sphere therefore no emission records were reviewed.

A review of Semi annual deviation reports and reported chemical releases found one instance of a release from EU91-S1.

Material	Date	Time	Duration	Amount	Comment
1,3 Butadiene	May 1, 2018	2:38 PM	30 Minutes	<1 lb	A leak formed in a line in a compressor due to a failed regulator.

There are no *Material Limits* in the ROP.

Process/Operational restrictions

SC III.1. limits the Buta storage sphere to a psig of not more than 80 psig on a continuous basis.

Review of records December 2016, June 2017, and November 2018 Buta sphere psig operating data indicate the facility is in compliance with the < 80 psig limit.

DATE	Reading	Comment
Dec 9 – 16, 2016	10 -18	
June 9 -16, 2017	12 – 20 psig	
Nov 9 – 16, 2018	12 -17 psig	
Jan 16, 2019	13 psig	Instantaneous; Operator control readout

Design/Equipment parameters

SC IV 1. Requires the process to allow transfer into or out of the Buta storage sphere only if the pressure regulating system is installed, maintained and operated in a satisfactory manner. Review of records and on site operations monitoring and equipment indicate the facility is in compliance with the pressure regulating system requirement.

SC IV 2. Requires the process to perform rail car unloading into the EU91-S1 Buta storage sphere only if the vapor return system to be installed, maintained and operated in a satisfactory manner . Review of records and on site operations monitoring and equipment indicate the facility is in compliance with the vapor return system requirements for railcar unloading. The process uses a closed loop. As liquid is drawn off railcar, headspace of sphere vented to compressor then back to railcar. One pressure relief device at top of sphere vents to atmosphere if psi \geq 80 (rupture disc). A transmitter would send a signal to operations if rupture disc blown.

SC IV 3. Requires that the Buta storage sphere shall not be prepared for maintenance unless all emissions are vented to the 954THROX and the 954THROX is installed, maintained, and operated in a satisfactory manner. It has been more than 5 years since any maintenance was performed on the sphere. While viewing the EU91-S1 equipment we did view the manual valves on either side of the C-2 compressor that must be opened to pipe sphere vapors to 954 THROX.

SC IV 4. Requires the process to equip and maintain EU91-S1 with a nitrogen purge of the transfer assembly prior to the disconnection of railcars. The transfer system has interlocks that require nitrogen purge is activated before disconnect.

There are no *Testing/Sampling requirements* in the ROP.

Monitoring/Recordkeeping

SC VI 1 requires the facility maintain records of the operating pressure of the EU91-S1 storage tank each time a high pressure alarm is triggered and the corrective action taken to resolve the problem for EU91-S1. The ROP allowed psig is ≤ 80 . There have been no periods of time in the last five years when the Buta sphere pressure has approached 80 psi. The process has an operations alarm set at 30 psig for the Buta sphere.

SC VI 2 requires the calculation and maintenance monthly emission records. November 2017 and November 2018 records are attached.

Date	Number of Railcars unloaded	Monthly TOTAL emissions 1,3 Butadiene (lbs)
Nov 2017	19	0.627
Nov 2018	23	0.759

There are no *Stack/Vent restrictions* in the ROP for EU91-S1

EU86-S1

The EU86-S1 process is the unloading, storage, and distribution of purchased styrene. Equipment located in 954 Building. Emissions are controlled by a carbon bed adsorber system.

This emission unit was permitted in PTI 350-88C issued on July 3, 2003 and has been rolled into the ROP in 2004. This emission unit is subject to the requirements of 40 CFR Part 63, Subparts A, JJJ, EEEE, and equipment leak provisions of Subpart H.

During the inspection we reviewed the railcar transfer system, tanks, and associated emission control devices, monitoring, and ROP required records.

All areas evaluated indicate the facility is in compliance with the requirements of MI-ROP-A4033-2017b, EU86-S1.

ATTACHMENTS

EU86-S1 process flow diagram

2018 preventative maintenance records for absorb (B-700 blower) and desorb (ME-700) vacuum flowmeters

Operations record example from Dec. 8-15, 2016, June 12-19, 2017, and Nov. 1-7, 2018

D/A ratios; blower rates

FILES REVIEWED

40 CFR Part 63 Subpart H and JJJ, Semi annual report September 2018

ROP Semi Annual Deviation Reports September 2017 through September 2018

Release Reports September 2016 – November 2018

Saginaw Bay AQD PTI 350-88C application and permit file

EU86-S1: Compliant

Railcars unload styrene to an intermediate storage tank. Styrene is pumped from the intermediate storage tank to one of four tanks. Offloading takes 24 hours and may involve 4 – 16 railcars. An offload is generally conducted every other day. Tank headspace displaced while loading is vented to Absorber #2. Absorber #2 is comprised of two carbon beds. The carbon beds are operated alternately for receiving styrene emissions. While one carbon bed is receiving vent exhaust to absorb styrene, the other carbon bed is being desorbed using vacuum of the carbon bed. The exhaust from desorb is vented to a knockout pot and condenser for styrene reclaim. Nitrogen is used to maintain inert atmosphere in the four tanks.

Emission limits

The following limits apply to EU86-S1

Pollutant	Limit	Time Period/ Operating Scenario
1. Styrene	0.322 pph ²	Test protocol

The facility has interlock in the offloading process control that only allows offloading to one tank at a time. The styrene pph emission calculations conducted, for the worst case of venting from all tanks transferring styrene out and all rail stations offloading, is < 0.322 pph.

I reviewed an example of annual emission of styrene from Tank T3. For 2017 the total emissions were 62.3 pounds. The process tracks the pounds of styrene transferred and assumes the process is operating 8760 hours. The carbon beds (Adsorber#2) has a 98% emission reduction rate.

Records review indicate that the facility is in compliance with styrene limit of 0.322 pph.

A review of Semi annual deviation reports and reported chemical releases found one instance of a release from EU86-S1.

Material	Date	Time	Duration	Amount	Comment
Styrene	October 24, 2016	6:00 PM	10 Minutes	22 lbs	An instrument tech was troubleshooting a level instrument (bubbler) on an unload vessel. Because all feeds to the unload vessel were stopped at the time, the instrument tech assumed that the material level would be below the top of the unload vessel. With that assumption, the instrument tech removed the plug on the bubbler's dip pipe, at which time material began flowing out of the dip pipe, leaking to the trench below and into the fire pit.

There are no *Material Limits* in the ROP.

Process/Operational restrictions

I reviewed operations records for D/A ratios and the blower rates associated with the desorb and adsorb carbon bed activity. The D/A ratio is based on each carbon bed desorption rate (ME-700 scfm) to adsorption rate (B-700 scfm). The data review included monitoring from offloading periods. Offloading pump will automatically shutdown once D/A is below 1. The June 2017 data contained large differences in meter reading that indicates meter malfunction. The June 2017 graph shows offloading started, then stop due to metering issue.

Date	D/A range	ME-700 (desorb) flow	B-700 (adsorb)flow
December 8-15 2016	2 – 4.2		
June 12-19, 2017	-0.03 – 3 (includes shutdown period)		
November 1-7, 2018	1.6 – 3.5		
January 16, 2019 (instantaneous)	1.8	138	16

Review of blower operating data and D/A tracking indicate the facility is in compliance with the ≥ 1 D/A ratio requirement.

There are no *Design/Equipment requirements* in the ROP.

There are no *Testing/Sampling requirements* in the ROP.

Monitoring/Recordkeeping

I reviewed attached graphs with operating data showing continuous monitoring of D/A and blower flows. The facility is in compliance with recordkeeping requirements.

Stack/Vents

The information on the stacks listed in the table below was verified during the inspection.

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Description
1. SV86010	12 ¹	50 ¹	Carbon bed vent post B-700 blower

Other Requirements

The process is prohibited from transferring any styrene to the EU86-S1 tanks unless Adsorber #2 is installed, maintained, operated in a satisfactory manner. Review of records and on site operations monitoring and equipment indicate the facility is in compliance with the Adsorber #2 operating requirements.

NAME

[Handwritten Signature]

DATE

1/25/19

SUPERVISOR

C. Hare