



Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

November 3, 2023

Mark Gorog P.E., Regional Manager Air Quality Program
Pennsylvania Department of Environmental Protection (PADEP)
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

RE: PA-04-00740C Polyethylene Manufacturing Lines (Source ID 202) Particulate Filters (PE MFG) (Source ID C202) Malfunction Report

Dear Mr. Gorog,

Shell Chemical Appalachia LLC (“Shell”) is submitting this malfunction report to the Pennsylvania Department of Environmental Protection (PADEP) for Particulate Matter (PM) emissions from the Dry Catalyst Feeder in Polyethylene Unit 1 (PE1)¹ on October 05, 2023.

This malfunction did not pose an imminent and substantial danger to the public health and safety or the environment.

- **Name and location of the facility**
Shell Polymers Monaca
300 Frankfort Road, Monaca PA, 15061
- **Nature and cause of the incident**
On October 5, 2023, at approximately 08:30, PE1 was depressuring catalyst feeders to clear a differential pressure permissive between the PE1 Reactor feeders and the PE1 Reactor in preparation for unit startup. While depressuring, a PE1 field operator noticed a visible dust cloud originating from the two PE1 dry catalyst vent lines. Visible emissions lasted approximately 5 minutes.
- **Time when the malfunction or breakdown was first observed**
The dust cloud was identified at approximately 08:30 on October 5, 2023.
- **The date and time that the malfunction started and ended**
The release of particulate matter from the PE1 dry catalyst vent lines started at approximately 08:30 and ceased at approximately 08:35 on October 5, 2023.
- **An estimate of the emissions associated with the malfunction**

¹ PE1 is one of three units within Polyethylene Manufacturing Lines (Source ID 202)

Pollutant	Emissions (lb)
PM	26.4
Toluene (HAP)	0.79

In this incident the PM source is uncontrolled catalyst fines from PE1 process vents released to the atmosphere. The catalyst material is predominantly silica and contains no metallic hazardous air pollutants (HAP). The catalyst may contain no greater than 3% toluene and a conservative estimate of the total release as 3% toluene has been included.

- **The calculations that were used to determine that quantity**

Release quantity has been estimated from the operator's visual field observations and amount of recovered catalyst material in the vicinity of the release.

- **The steps, if any, that the facility took to limit the duration and/or quantity of emissions associated with the malfunction**

In the Central Control Room, the PE12 team verified that standard alarms for dust came in on the PE12 Operator Console at the same time the dust cloud was observed in the field. In response to the event, all available PE12 field operators were dispatched to investigate the source of the dust. Once the source was identified, the vent lines were immediately blocked-in, which stopped the visible emissions. It is important to note that no evidence of the catalyst dust material contacting onsite stormwater ponds or the Ohio River could be found. In addition, the site's Emergency Response Team surveyed for any offsite visible dust clouds and/or particulate matter on the ground, and none were identified. This release was contained within the local vicinity of the PE1 Unit.

- **A detailed analysis that sets forth the Root Cause of the malfunction, to the extent determinable**

Background:

The purpose of the Reaction System is to produce polyethylene resin by polymerization of reactants with the aid of a catalyst. In the SPM PE12 reaction system, dry catalyst is fed to the reactor by two catalyst feeders (X-34036/ X-34037). During PE1 Reactor start-up, operators must bleed down the pressure in the feeders through the atmospheric vent line that contains particulate filters¹ designed to prevent the release of catalyst particles to the atmosphere.

Root Cause:

The PE Department investigated the cause of the catalyst release by reviewing Piping and Instrument Drawings (P&IDs), 3D unit models, and equipment standard records. It was confirmed that the filter element in both catalyst feeders atmospheric vent lines had not been installed. Further investigation revealed that the filter housings were originally shipped to SPM with the filter internal elements loose (not installed) and the housing itself assembled. During the Construction and Commission Start Up (CSU) phase, the filters were classified by mistake as in-line miscellaneous piping components; and therefore, no hold point existed to provide assurance that the internal filter elements were installed.

- **An analysis of the measures, if any, that are available to reduce the likelihood of a**

recurrence of a malfunction resulting from the same Root Cause or contributing causes in the future

The following corrective action will be implemented to prevent re-occurrence of an identical incident in the future:

- 1) **Completed** - Install filter elements in PE1 and PE2 catalyst feeders atmospheric vent lines.
 - 2) **In Progress** - Review all powder/dust catalyst vents to atmosphere throughout the site to identify if any similar mis-classified filter elements exist. If identified, verify that any similar filter elements have been installed. Take any additional correction action steps as needed.
- **To the extent that investigations of the causes and/or possible corrective action(s) still are underway on the due date of the report, a statement of the anticipated date by which a follow-up report will be submitted**

No follow up report is anticipated.

- **Corrective action is final or timeline for implementation**
N/A.

If you have any questions regarding this matter, please contact me at (724) 709-2467 or kimberly.kaal@shell.com.

Sincerely,

Kimberly Kaal
Environmental Manager, Attorney-in-Fact

CC:
Scott Beudway, Air Quality Specialist
Kristin Goddard, Air Quality District Supervisor
Beth Speicher, Environmental Group Manager