



Shell Chemical Appalachia LLC  
300 Frankfort Rd  
Monaca, PA 15061

March 2, 2023

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

**RE: PA-04-00740C Ethane Cracking Furnaces #1, #2, #5, and #6 (Source IDs 031, 032, 035, 036) NOx Excess Emissions Malfunction Report**

Dear Mr. Gorog,

Shell Chemical Appalachia LLC (“Shell”) is submitting this malfunction report to the Pennsylvania Department of Environmental Protection (PADEP) for excess emissions from Ethane Cracking Furnaces (Furnaces) on February 1, 2023.

- **Name and location of the facility**  
Shell Polymers Monaca  
300 Frankfort Road, Monaca PA, 15061
- **Nature and cause of the incident**

On February 1, 2023, at ~9:35AM the pump supplying aqueous ammonia to the Furnace selective catalyst reduction (SCR) control system tripped offline. This resulted in elevated NOx emissions (above 0.015 lb/MMBtu) on Furnaces #1, #2, #5, and #6 which were operating in cracking/normal mode as defined by PA-04-00740C.

Cause of the pump trip was determined to be a low pressure condition indicated by the pressure controller on the aqueous ammonia storage vessel. This resulted in an automatic trip of the pump in order to protect the pump from damage.

Operations took action to validate the pressure controllers operation in the field and confirm their function. The controllers had been recently subject to maintenance. Action was then taken to raise the pressure of the aqueous ammonia storage vessel and re-establish both the pump operation and ammonia injecton to the SCR by ~10:35AM.

The following long term corrective actions have been implemented to reduce the chance of a re-occurrence:

- Increase priority of the existing low pressure alarm;
- Add a new low pressure critical alarm;
- Revise alarm help to better facilitate operator response; and
- Review circumstances of incident with operators for learning from incidents.

- **Time when the incident was first observed, and duration of excess emissions**  
February 1, 2023 at ~9:35AM through ~10:35AM affecting two (2) block hours of NOx emissions.

Source ID	Name	NOx Duration (hrs)
031	Ethane Cracking Furnace #1	2
032	Ethane Cracking Furnace #2	2
035	Ethane Cracking Furnace #5	2
036	Ethane Cracking Furnace #6	2

- **Estimated rate of excess emissions**

Excess emissions have been calculated based upon the best available (currently uncertified) continuous emissions monitoring system (CEMS) data

Source ID	Name	NOx (lbs)	NOx (tons)
031	Ethane Cracking Furnace #1	41.0	0.020
032	Ethane Cracking Furnace #2	40.6	0.020
035	Ethane Cracking Furnace #5	31.8	0.016
036	Ethane Cracking Furnace #6	36.9	0.018
Total		150.3	0.075

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

Sincerely,

*Kimberly J. Kaal*

Kimberly Kaal  
Environmental Manager, Attorney-in-Fact

CC:  
Scott Beaudway, Air Quality Specialist  
Elizabeth Speicher, Environmental Group Manager