



Shell Chemical Appalachia LLC
300 Frankfort Rd
Monaca, PA 15061

February 2, 2022

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 Source IDs 101, 102, 103 Combustion Turbine/Duct Burner Units #1, #2, #3 NOx Emissions Malfunctions Report, January 14 through 26, 2022

Dear Mr. Gorog,

Shell Chemical Appalachia LLC (“Shell”) is submitting this incident report to the Pennsylvania Department of Environmental Protection (PADEP).

- **Name and location of the facility**

Shell Polymers Monaca
300 Frankfort Road, Monaca PA, 15061

- **Nature and cause of the incident**

On January 14 at ~7:00 AM Unit #3 NOx Controller reduced ammonia injection due to a deviation between the raw and oxygen corrected NOx analyzer readings. This resulted in one hour of elevated NOx emissions (above 2 ppmvd @ 15% O₂) while the analyzer correction was made, increased ammonia injection, and brought NOx emissions back under the limit.

On January 14 at ~10:30PM Unit #2 Ammonia Vaporizer temperature setpoint was reduced and ammonia injection became unstable with short term interruptions. This resulted in three hours of elevated NOx emissions (above 2 ppmvd @ 15% O₂) while the temperature stabilized, restored stable ammonia injection, and brought NOx emissions back under the limit.

On January 16 at ~10:00 AM Unit #2 Combustion Turbine primary and secondary fuel firing ratio became unstable resulting in the temporary loss of pre-mix steady state combustion. This resulted in one hour of elevated NOx emissions (above 2 ppmvd @ 15% O₂) while the fuel firing ratio was restored and brought NOx emissions back under the limit. Combustion Turbine primary and secondary fuel firing remain under continued investigation.

On January 20 at ~11:00 AM Unit #2 SCR Heater A tripped due to reaching a high temperature limit, interrupting ammonia injection while switching to SCR Heater B. SCR Heater B subsequently also tripped resulting in loss of ammonia injection. This

resulted in four hours of elevated NOx emissions (above 2 ppmvd @ 15% O2) while the switch was made between heaters, SCR Heater B restarted, stable ammonia injection restored, and brought NOx emissions back under the limit.

On January 22 at ~1:45 PM Unit #2 Combustion Turbine tripped offline due to an exciter fault. Primary and secondary fuel firing ratio became temporarily unstable prior to shutdown likely resulting in loss of pre-mix steady state combustion. This resulted in two hours of elevated NOx emissions (above 2 ppmvd @ 15% O2) before the unit went offline. NOx emissions and combustion returned to normal following the restart.

On January 26 at ~7:30 AM and 7:00 PM Unit #1 Ammonia Blower trips offline due to reaching high temperature limits and closure of ammonia supply valve, temporarily interrupting ammonia injection. This resulted in three hours of elevated NOx emissions (above 2 ppmvd @ 15% O2) while the blower relay was reset, adjustments were made to limit high temperatures, ammonia supply valve was re-opened to restore ammonia injection, and brought NOx emissions back under the limit.

- **Time when the incident was first observed, and duration of excess emissions**

January 14, 2022 at ~ 8:00 AM 1 hour (Unit #3)
January 14, 2022 at ~ 10:30 PM 3 hours (Unit #2)
January 16, 2022 at ~ 10:00 AM 1 hour (Unit #2)
January 20, 2022 at ~ 11:00 AM 4 hours (Unit #2)
January 22, 2022 at ~ 2:00 PM 2 hours (Unit #2)
January 26, 2022 at ~ 8:00 AM 3 hours (Unit #1)

- **Estimated rate of excess emissions**

01/14/22 Unit #3 – NOx rate of 2.05 ppmvd @ 15% O2, and 1 lb total excess emissions over 1 hour.
01/14/22 Unit #2 – NOx rate between 2.98 and 3.27 ppmvd NOx @ 15% O2, and 14.4 lbs total excess emissions over the 3 hours.
01/16/22 Unit #2 – NOx rate of 11.70 ppmvd @ 15% O2, and 27.3 lbs total excess emissions over 1 hour.
01/20/22 Unit #2 – NOx rate between 2.05 and 6.43 ppmvd NOx @ 15% O2, and 30 lbs total excess emissions over the 4 hours.
01/22/22 Unit #2 – NOx rate between 10.86 and 95.29 (1-minute operating hour) ppmvd @ 15% O2, and 19.6 lbs total excess emissions over the 2 hours.
01/26/22 Unit #1 – NOx rate between 2.33 and 4.23 ppmvd NOx @ 15% O2, and 12.5 lbs total excess emissions over the 3 hours.

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

Sincerely,

Kimberly Kaal

Kimberly Kaal
Environmental Manager, Attorney-in-Fact

CC:

Scott Beaudway, Air Quality Specialist
Anna Fabrizi, District Supervisor