



February 9, 2024

Matt Karl
Dept. of Environment, Great Lakes, and Energy
Air Quality Division
Lansing District
P.O. Box 30242
Lansing MI 48909

Subject: A1641_VN_20240122 Rule 912 Deviation Report

Dear Mr. Karl,

General Motors LLC (GM) Lansing Grand River (LGR) is submitting this letter in response to Violation Notice No. A1641_VN_20240122 issued by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) Air Quality Division (AQD) that GM received via email on January 22, 2024.

The VN alleges that GM modified a Regenerative Thermal Oxidizer (RTO) at LGR and that this decreased its destruction efficiency. This, in turn, allegedly violated MI-ROP-A1641-2017 FG-Topcoat SC IV.1; R 336.1910; and R 336.1912.

GM takes its environmental compliance responsibilities very seriously and appreciates EGLE's concerns as expressed in the VN and otherwise. GM respectfully asks EGLE to consider that, under the facts of this matter described in this letter, GM acted with thoughtful integrity with the information that was understood at the time and that EGLE should exercise its enforcement discretion and conclude this matter without further action.

The VN followed GM's voluntary report of a malfunction and temporary (six days) repair to the RTO. It requests that GM submit a response by February 12th containing the dates the violations occurred; an explanation of the causes and duration of the violations; whether the violations are ongoing; a summary of the actions that have been taken and are proposed to be taken to correct the violations and the dates by which these actions will take place; and what steps are being taken to prevent a reoccurrence. GM provides this response without making any admissions and reserving all rights.

Background

RTO No. 1 (RTO) at LGR controls emissions from EU-Electrocoat, the curing oven for EU-Guidecoat, and the two curing ovens for FG-Topcoat in the Paint Shop. A rotary valve at the bottom of the RTO distributes the incoming process air from the controlled emission units upward through ceramic thermal media and into the combustion chamber for VOC destruction. The rotary valve is designed to index every 15 seconds. Directly above the rotary valve is a stater plate, which is a stationary piece that supports the ceramic thermal media above. The stater plate divides the ceramic media into 12 equal pie slices (sections). As the rotary valve indexes, these sections will rotate through different positions where it is either directing influent air as it passes up into the combustion chamber, directing effluent air as it leaves the combustion chamber, or is covered by the rotary valve. At any given time, there are five sections apportioned to influent air, five sections apportioned to effluent air, and two sections covered by the rotary valve with no air flow. See Figure 1 for details.

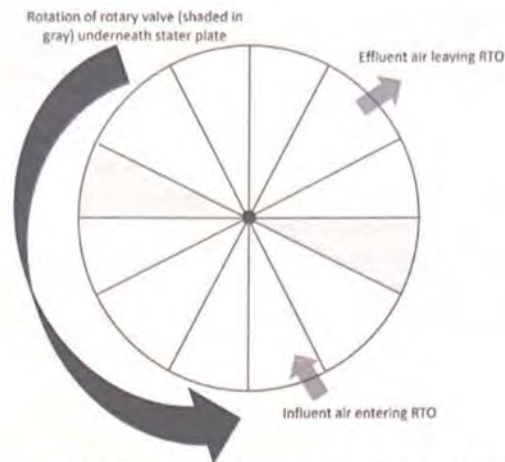


Figure 1: Top view of the rotary valve and stater.

When the RTO was started up on Tuesday, January 16th (no production on Monday the 15th for MLK Day), the rotary valve would not properly index. Further investigation found that four of the 2" x 2" x 37" stainless steel bars on the stater plate had deflected down to the point where the rotary valve could not rotate underneath as designed. No vehicles were in process at the time and no production in the Paint Shop occurred on the 16th.

On Wednesday, January 17th, the deflected metal was removed from the four defective stater bars. The initial plan was to grind down the deflected sections, but grinding proved ineffective. The deflected sections of the four affected bars were removed as a temporary repair to allow the RTO to continue to operate pending complete repairs. The space vacated by these removed sections allows a path where some air entering the RTO could cross from the influent to the effluent side without first flowing into the combustion chamber. This cross-over path was only available during six of the twelve index cycles of the rotary valve.

Very light production in the Paint Shop resumed on the afternoon of Wednesday January 17th.

GM verbally notified EGLE of this matter by telephone on January 19th, 2024.

Dates of occurrence

The RTO operated with the modified stater plate during day shift on January 17, 18, and 22 – 25, 2024. During this time, 625 vehicles were processed through the abated emission units. When assuming 0% destruction efficiency (DE) as explained in the VN letter, an estimated 1,002 pounds of VOCs were emitted over and above what would be emitted if the typical 95.0% destruction efficiency were used.

Explanation of causes

The RTO was operating the week of January 8th despite having no production to keep the equipment moving during cold weather. On January 12th, the regulator valve on the air spring failed. The air spring is designed to push the rotary valve up tight against the stater plate. The regulator valve was replaced and the RTO resumed operation into the weekend. On the morning of Sunday, January 14th, the rotary valve failed to index. It is believed that the the air spring replacement may have slightly changed the distance between the rotary valve and stater plate, causing it to catch on a minor defect on a stater bar. During the failure to index, the automated shutdown of the RTO did not commence as designed, and the temperature of the exhaust air rose to levels where the four stater

bars positioned in the effluent sections for an abnormal period of time were able to deflect. The RTO did not run until attempts to start it up for production on the morning of Tuesday January 16th, when multiple failed start up attempts revealed the deflected bars. The cause of the error in the shutdown was an error in the RTO controls logic. This logic error has been corrected.

Prior to temporarily repairing the stater as described and prior to resuming production on January 17th, a thorough evaluation of GM's Renewable Operating Permit (ROP) was conducted to see if the proposed change would deviate from any permit requirements. Based on their reading of the permit, personnel believed in good faith that the emissions expected from the planned very low volume of production would still be well within permitted limits and would be permitted pending repair of the unit; therefore, light production occurred on the six days as discussed above. Key considerations in the initial evaluation were as follows:

FG-Facility S.C. III.2: The permittee shall not operate the Electrocoat dip tank, the Electrocoat cure oven, the guidecoat curing oven, and the two topcoat curing ovens unless Thermal Oxidizer No. 1 is installed, maintained and operated in a satisfactory manner. Satisfactory operation of the thermal oxidizer includes maintaining a minimum combustion chamber temperature of 1,400 °F and a minimum retention time of 0.5 seconds. In lieu of a minimum temperature, an average temperature of 1,400 °F based upon a three-hour rolling average may be used. GM determined that it could continue to operate the RTO at the required temperatures and believed in good faith that this was sufficient to comply with this permit condition. The ROP does not explicitly require a minimum destruction efficiency for RTO No. 1.

FG-Facility S.C. VI.3: Permittee shall monitor or secure the valve or closure mechanism controlling each bypass line for each capture system in a non-bypass mode such that the valve or closure mechanism cannot be opened without creating a record that it was opened. GM determined that the bypass valve would remain closed and that, therefore, this permit condition would be met.

Emission limits set by FG-Facility S.C. I: Given that the proposed modification to remove approximately half of the length of the stater bars would create an opening for air to cross over into the effluent on half of the rotary valve cycles, an estimate of 70% destruction efficiency was initially used. The materials and labor to replace the stater would be procured quicker than a performance test could be conducted, which is why this estimated destruction efficiency was used in the evaluation. Using this estimated destruction efficiency and the forecasted production volume, GM initially estimated that additional emissions from the repair would add 0.36 pounds of VOC per job and a total of 129 pounds of VOCs. Based on the most current monthly emissions reports, GM determined that the added estimated emissions would be below the limits of 5.73 pounds of VOCs per job and 606 tons of VOCs (12 month rolling total); based on this determination, it was believed in good faith that this permit condition would be met.

Emission limits set by FG-Facility S.C. I: As is allowed in the ROP, GM chooses to comply with Special Condition No. I.2 because each individual material added to the Electrocoat system contains no more than 1.0 percent by weight of any organic HAP and no more than 0.10 percent by weight of any OSHA-defined carcinogenic organic HAP. GM does not factor in abatement to demonstrate compliance to MACT limits. GM determined that the facility would thus remain in compliance with the MACT limits when temporarily operating the RTO with a reduced destruction efficiency.

After follow-up discussions with EGLE to clarify the VN, GM appreciates EGLE's view that the initial evaluation of the permit conditions does not meet the intent of Rule 910. The intent of Rule 910 of maintaining a minimum destruction efficiency of 95% is not explicitly defined in the rule, the permit language, or GM's Malfunction Abatement Plan (MAP) and therefore was not thought of when facility staff made the initial evaluation to perform the repair and resume production.

Are violations ongoing

No violations are ongoing. A new stater plate was installed January 26 – 28, 2024. No production occurred during this time. GM resumed painting operations on January 29, 2024, with the RTO operating as designed and in compliance with the requirements of the ROP.

Summary of corrective actions

A replacement stater plate has been installed. The error in the RTO controls logic has been corrected. The GM LGR Malfunction Abatement Plan has been revised to more clearly define the requirements set by Rule 910 that are not explicitly defined in the ROP.

Summary of preventative measures

To prevent other automated shutdowns not commencing as designed, a process is being established to periodically evaluate controls logic on abatement systems for potential errors. To prevent future misinterpretations of the ROP and the requirements applicable to abatement equipment, the Malfunction Abatement Plan has been revised and is set on a regular review cadence. The MAP has also been revised to include a more comprehensive escalation protocol.

In addition, pursuant to Rule 915, GM appreciates the opportunity to provide the following information for EGLE's consideration in determining whether to exercise enforcement discretion in this matter:

Rule 915 (3) A person may submit evidence to the department for its consideration in determining that the emission violations resulted from a malfunction. The evidence shall demonstrate all of the following, as applicable:

(a) The excess emissions were a result of a sudden and unavoidable breakdown of process or control equipment, beyond the reasonable control of the person.

The breakdown of the RTO due to the deflection of the stater bars was unforeseen and unavoidable beyond reasonable control.

(b) The air pollution control equipment, process equipment, and processes were maintained and operated in a manner consistent with good practice for minimizing emissions, to the maximum extent practicable.

As discussed above, GM operated in good faith under the initial assessment that no permitted emission limits would be exceeded and that the temporary repair would minimize emissions to the extent practicable.

(c) The excess emissions caused by a bypass (an intentional diversion of control equipment) were unavoidable to prevent loss of life, personal injury, or severe property damage.

This factor is not applicable to this matter.

(d) Repairs were made in an expeditious fashion when the person knew or should have known that applicable emission limitations were being exceeded. To the extent practicable, off-shift labor and overtime shall have been utilized to ensure that the repairs were made expeditiously.

Upon discovery of the issue with the stater plate on January 16, GM arranged with the OEM the same day to procure a replacement. The replacement was installed as quickly as possible on January 26 – 28.

(e) The amount and duration of excess emissions, including any bypass, were minimized to the maximum extent practicable during periods of the emissions.

As discussed above, GM operated in good faith under the initial assessment that no permitted emission limits would be exceeded. The RTO continued to operate (albeit with reduced effectiveness) and production was very low during this period.

(f) All reasonably possible steps were taken to minimize the impact of the excess emissions on ambient air quality.

As discussed above, GM operated in good faith under the initial assessment that no permitted emission limits would be exceeded. GM does not believe that there were any appreciable impacts on ambient air quality.

(g) The excess emissions resulting from the malfunction were not part of a recurring pattern indicative of inadequate design, operation, or maintenance.

This type of malfunction has not happened before and is not indicative of inadequate design, operation, or maintenance. The error in the controls logic that caused the conditions for the deflection was corrected as soon as it was identified.

(h) The malfunction was an infrequent event and was not reasonably preventable.

This type of malfunction has not happened before and could not have been reasonably anticipated or prevented.

(i) All emission monitoring systems were kept in operation if at all possible.

GM's Compliance Assurance Monitoring (CAM) plan identifies the combustion chamber thermocouple as the monitoring system for RTO No. 1. This thermocouple continued to monitor temperature as normal. The temperatures recorded during operations on January 17, 18, and 22 – 25 were all above the required 1,400°F.

(j) The person responsible for operating the source of air contaminants has a malfunction abatement plan, consistent with the requirements set forth in R 336.1911(2) and with both of the following provisions:

(i) Any malfunction abatement plan developed in accordance with R 336.1911(2) shall be maintained onsite and available for inspection, upon request, by the department for the life of the emission unit or units. The department may require that the person responsible for the malfunction abatement plan make revisions to the plan. The person shall revise the malfunction abatement plan within 45 days after a request by the department. The revised malfunction abatement plan shall be developed in accordance with R 336.1911(2).

(ii) If the malfunction abatement plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, then the person shall revise the malfunction abatement plan within 45 days after the event occurs. The revised malfunction abatement plan shall be developed in accordance with R 336.1911(2).

GM has revised its previously existing Malfunction Abatement Plan (MAP) as a result of this matter.

(k) The excess emissions presenting an imminent threat to human health, safety, or the environment were reported to the department as soon as possible. Unless otherwise specified in the facility's permit, other excess emissions were reported as provided in R 336.1912. If requested by the department, a person shall submit a full written report that includes the known causes, the corrective actions taken, and the preventive measures to be taken to minimize or eliminate the chance of recurrence.

GM did not initially believe that this incident triggered reporting required under Rule 912. Nonetheless, GM contacted EGLE on January 19, 2024 within 2 business days of the start of the malfunction period. The MAP has been revised to include EGLE as a contact for malfunctions.

(l) The actions during the period of excess emissions were documented by contemporaneous operating logs or other relevant evidence as provided by R 336.1912.

Information from this period has been documented, including vehicles painted. At EGLE's request, GM submitted a 912 report dated January 25 and 26, 2024 to EGLE.

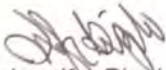
(m) Any information submitted to the department under this subrule shall be properly certified in accordance with the provisions of R 336.1912.

This letter has been certified with the enclosed EQP 5736 Form.

Based on the foregoing, GM respectfully requests that EGLE exercise enforcement discretion in this matter and consider this matter resolved based on GM's good faith consideration of the factors relating to this incident as discussed above, its voluntary initial report of this incident to EGLE on January 19, 2024, EGLE's issuance of the Violation Notice, GM's deviation report dated January 25 and 26, GM's prompt permanent repair of the RTO, and this response.

If you have any questions or need additional information, please contact Brent Cousino at 810-813-4775 or brent.cousino@gm.com.

Sincerely,



Jennifer Bigelow
Plant Director

cc: Matt Karl via email to KarlM@michigan.gov
Jenine Camilleri, Enforcement Unit Supervisor, EGLE Air Quality Division
(submitted hard copy to PO Box 30260 Lansing MI 48909)
Jeff Hummel, Sr. Environmental Project Engineer, General Motors
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encl. EQP 5736