

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

B722745882

FACILITY: GENERAL MOTORS LLC - ORION ASSEMBLY		SRN / ID: B7227
LOCATION: 4555 GIDDINGS RD, LAKE ORION		DISTRICT: Southeast Michigan
CITY: LAKE ORION		COUNTY: OAKLAND
CONTACT: Robert Fenn , Environmental Engineer		ACTIVITY DATE: 08/29/2018
STAFF: Robert Byrnes	COMPLIANCE STATUS: Unknown	SOURCE CLASS: MAJOR
SUBJECT: 2018 Scheduled Inspection.		
RESOLVED COMPLAINTS:		

On August 29, 2018, Matt Karl and I conducted a scheduled inspection of General Motors, LLC- Orion Assembly (GM Orion), located at 4555 Giddings Road, Orion, Michigan. The purpose of the inspection was to determine the facility's compliance with the following air rules and regulations: Federal Clean Air Act Part 55, Air Pollution Control of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, Renewal Operating Permit (ROP) No. MI-ROP-B7227-2015a, Title 40 of the Code of Federal Regulations (CFR) Part 63 Subpart IIII- National Emissions Standards for Hazardous Air Pollutants: Surface Coating of Automobiles and Light-Duty Trucks (NESHAP IIII), Title 40 of the CFR Part 60 Subpart MM- Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations, Title 40 of the CFR Part 60 Subpart JJJJ – standards for new emergency spark ignition engines, Title 40 of the CFR Part 63 Subpart EEEE- National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline), Title 40 CFR Part 63 Subpart DDDDD – standards for industrial boilers and process heaters, Title 40 CFR Part 63 Subpart ZZZZ – standards for reciprocating internal combustion engines, and Title 40 of CFR Part 64- Compliance Assurance Monitoring (CAM).

The assembly plant (body, paint, & final), the powerhouse, and the landfill engine installation were visited on the inspection. Jessica Jeffries, GM Staff Environmental Engineer, and Rob Fenn, GM Orion Plant Environmental Engineer, assisted us during the inspection.

Facility Background

GM Orion is an automotive assembly plant. They are currently manufacturing the Chevrolet Sonic (both sedan and hatch batch body styles) and the Chevrolet Bolt. The plant currently operates on one shift from 6:00 am to 3:30 pm with only a few Saturdays scheduled for the remainder of the year.

The main assembly building is divided into three primary areas: Body Shop, Paint Shop, and General Assembly. The Powerhouse is a separate building located on the east side of the main assembly building. Just outside of the Powerhouse is a separate building for the Land Fill Gas (LFG) Engines.

Body Shop

The primary activity in the Body Shop is welding. Sealers are also in the body shop as well. The company tracks usage and VOC emissions from use of the sealer. All activities in the Body Shop are vented to the general in-plant environment.

Paint Shop

From the Body Shop the vehicle bodies are transported to the Paint Shop. The Paint Shop began operating on August 1, 2011. Air-related activities in the Paint Shop are now covered by MI-ROP-B7227-2015a. A description of the emission units within the Paint Shop are listed below.

EU-PRETREATMENT

The vehicle bodies are conveyed through a pretreatment process, which includes spray and immersion application of cleaner and thin film coating. The process previously used Henkel products but the facility has switched to Chemetall. All of the pre-treatment products except one contain no VOCs. The one product with VOC resulted in a total of 230 pounds of emissions for July 2017 through June 2018. Heat for the pretreatment process is provided by the on-site Powerhouse. I observed operation of the pretreatment process during the

inspection. Review of the VOC emissions from July 2017 through June 2018 show material usage rates and VOC emissions. See VOC emission calculations attached to this report.

EU-ECOAT

After pretreatment, the vehicle bodies are sent to an immersion tank via a conveyor system for the electrodeposition of a rust-preventative coating. This process is also known as Ecoat or ELPO. The ELPO coating consists of a resin and a paste manufactured by BASF. After the vehicle bodies are Ecoated, they are sent to a curing oven and a cooling zone. Emissions from the Ecoat process and the associated curing oven are controlled by a regenerative thermal oxidizer (RTO). Refer to the FG-CONTROLS paragraph below for a detailed description of the operation of the RTO. The operation of the Ecoat process was observed during the inspection.

EU-ECOAT also includes a dry filter scuff booth. The Scuff Booth is used for spot repairs. Repair activities include the following: buffing, sanding, and spray application of coating by aerosol can. The booth is equipped with dry filters for control of particulate emissions. The filters are visually inspected on a weekly basis. Filter inspections and filter change records are maintained by the company. See Attachments for a copy of recent filter inspections. See Attachments for a copy of recent filter changes. The Scuff Booth vents to the general in-plant environment. Emission records were obtained for July 2017 through June 2018 and are attached to this report. The emission total was 0.39 tons for the 12 month period.

EU-SEALERS

From the Ecoat Curing Oven, the vehicle bodies are conveyed to the following sealer application stations: hem sealer, underbody sealer, seam sealer, and anti-chip sealer. Application of the sealers is vented to the general in-plant environment. The vehicle bodies are run through a sealer curing oven, which is controlled by the RTO. Refer to the FG-CONTROLS paragraph below for details regarding the operation of the RTO. The operation of the manual and automatic sealer application was observed during the inspection. Emission records were obtained for June 2017 through July 2018 and are attached to this report. The emission total was 0.63 tons for the 12 month period.

EU-SOUND DAMP

An acoustical damper product (sound deadener) is also applied to the vehicle bodies. The sound deadener is applied using robotic equipment. The sound deadener does not contain any VOCs as reported for the June 2017 through July 2018 emission records obtained. Application of the deadener is vented to the general in-plant environment. The application of the sound deadener was observed during the inspection.

EU-THREE WET

From the Sealer Oven, the vehicle bodies are conveyed to one of two parallel coating processes, known as the Three Wet Process. On the Three Wet Process the vehicle bodies are sent through an automatic primer booth and then to a heated flash-off area. From the heated flash-off area, the vehicle bodies are sent through an automatic basecoat booth and then to another heated flash-off area. From the second heated flash-off area, the vehicle bodies are sent through an automatic topcoat (clearcoat) booth and finally through a curing oven and cooling zone. The coatings are applied using bell cup applicators. The operation of the 2 parallel lines of the Three Wet Process was observed during the inspection.

The primer and basecoats are water-based coatings manufactured by Axalta (previously DuPont). The primer is usually gray, but it can also be red. There are currently eleven basecoat colors applied in the Paint Shop. The clearcoat is a two-part, solvent based coating manufactured by Axalta. Part A of the clear coat can be clear or tinted. Part B of the clearcoat is a catalyst. The mix ratio of Part A to Part B is 3.2 parts to 1 part. Thinning solvent is occasionally added to coatings in the mixing room. The thinners and line cleaners generally used are (EEP) and N-Butyl Acetate. The company tracks thinner usage in their emissions records.

A continuous flow water wash runs under the coating booths for emissions control. There is an interlock system in place to ensure that the coating lines do not run unless the water wash is operating. The wash water goes through an on-site sludge system. The company has a contract to manage the sludge system. The water wash system is checked for proper operation on a weekly basis. See Attachment for records of daily water wash checks from June 15, 2018. Other paper filter records are kept and are attached to this report. Filter records are included for April 27, 2018 through July 16, 2018. The weekly reports show all filters were green (status ok) or yellow at worst meaning they were approaching review.

The spray booths, flash off areas, and curing oven are controlled by a RTO. Refer to the FG-CONTROLS paragraph below for details regarding the operation of the RTO.

GM Orion verified the transfer efficiency of primer coating and clearcoat coating operations on January 23, 2012. The company also verified the PM-10 emission rate from the paint main stack on March 19-20, 2012. The test reports are located in the orange folders in the AQD District files.

EU-THREE WET also includes the Finesse Booth used for small spot repairs after the vehicle bodies emerge from the Three Wet Curing Oven. Repair activities include the application of a rubbing compound, sanding, and buffing. The booth is downdraft and is equipped with filters. If a vehicle body has a large defect it is re-run through the Three Wet Process.

FG-CONTROLS

As previously mentioned, emissions from the Ecoat Curing Oven, the Sealer Curing Oven, the Three Wet clearcoat booths, and the Three Wet flash off areas are controlled by a RTO. The ventilation system is configured so that eighty percent of the clearcoat booth emissions are re-circulated within the clearcoat booth and the remaining twenty percent is exhausted to the RTO. There is an interlock system in place to ensure that vehicle feed to the coating lines ceases in case of RTO malfunction. The RTO is equipped with a continuous temperature gauge. During the inspection, the following operational parameters were observed:

Inlet Temperature: 182 degrees Fahrenheit (previously 183)
Set Point Temperature: 1550 degrees Fahrenheit (previously 1560)
Operating Temperature: 1560 degrees Fahrenheit (previously 1547)
Damper Sequence time: 210 seconds
CV: 28% (previously 67%)
Differential Pressure: 9.0" wc (previously -13.1")
Natural Gas Flow: not observed (previously 3540 SCFH)
Thermal Efficiency: 94.6% (previously 94.7%)

Also attached to this report are graphs of the RTO temperature for the June 28, 2018 through July 8, 2018. The records show that the RTO is operated at over 1500°F while the permit requirement is a minimum of 1400 °F.

The company has developed an Operation & Maintenance (O&M) Plan for the RTO. The company has the thermocouple of the RTO calibrated annually. The most recent calibrations were performed by Progressive Solutions on July 31, 2018

RTO maintenance records were obtained and are attached to this report. Those records show maintenance being conducted on the unit on July 9, 2018. The heat transfer media (cold and hot face) were visually inspected as well as the inlet and outlet butterfly damper operation and seals. It was suggested they maintain bake outs and adjust frequency accordingly. The inspection notes all the ceramic media was replaced last year and the pressure drop has been holding steady around 9.5" wc. The inspection report notes the gaps on the inlet and outlet butterfly dampers were worn and should be replaced. The RTO was last tested on March 19, 2012 and demonstrated a destruction efficiency of 95.5 percent. A request was made during the inspection to re-verify the destruction efficiency. GM agreed and will plan on a future test sometime next year.

EU-PURGE&CLEAN

The bell cup applicators and application hoses are purged with solvent between color changes or when necessary. Purging solvent is recovered by a solvent recovery system. The recovery tank is located by the Powerhouse. Full scale line cleaning is performed on a semi-annual basis or when necessary. Line cleaning is done in a closed loop system. Solvent is dispensed and reclaimed within a tote. Spent solvent is hauled off-site for proper disposal. Solvent is also used to clean conveyor grates and other spray booth equipment.

General Assembly

Finished vehicle bodies are conveyed to the General Assembly portion of the plant. General Assembly activities include Trim, Chassis, and Final Repair.

Trim

Various parts are installed on the vehicle in the Trim Area.

EU-GLASS INSTALL

Windows are installed on the vehicles in four cells, located in the Trim Department. The adhesive is applied robotically to bond the windshield and rear windows to the vehicle. The adhesive is dispensed from 55 gallon drums or totes. Emissions from the glass installation process are vented only to the general in-plant environment. The glass installation process was observed during the inspection. Emission records were obtained for July 2017 through June 2018 and are attached to this report. Emission totals were 0.55 tons for the 12 month period.

Chassis

Chassis are installed on the vehicles in the Chassis Department. In this department, each vehicle is filled with antifreeze, transmission fluid, engine oil, windshield washer fluid, refrigerant, brake fluid, and fuel. Each vehicle is equipped with an Onboard Re-Fueling Vapor Recovery (ORVR) System to control VOCs.

Vehicle Testing

This emission unit has previously been removed from the ROP as it is considered a mobile source. Finished vehicles are roll tested. There are five bays for roll testing. The vehicles are also sent through a water test booth to ensure that each vehicle is water tight.

EU-FINAL REPAIR

The vehicles are sent to Final Repair for any necessary repairs. There are six cross-draft repair booths and two downdraft repair booths. The two downdraft booths vent to the general in-plant environment. The six cross-draft repair booths vent outside through their own associated stack. All repair booths are equipped with dry filters. During the inspection, none of the booths were in operation as there were no vehicles to repair. Filters of the Final Repair booths are visually inspected on a weekly basis and replaced when necessary. The company maintains records of filter inspections and filter changes. See Attachments for a copy of recent filter inspections and filter changes.

The company verified the PM-10 emission rate from Final Repair on March 19-20, 2012. The test report is located in the orange folders in the AQD District files. Emission records were obtained for July 2017 through June 2018 and are attached to this report. Emission totals for were 0.06 tpy VOC and 0.01 tpy PM10.

Tank Farm

FG-TANKS

The tank farm is comprised of twelve above ground storage tanks ranging from 12,000 to 20,000 gallons in capacity. The tanks are used to store windshield washer fluid (methanol), gasoline, waste thinner, automatic transmission fluid, manual transmission fluid, anti-freeze (ethylene glycol), and diesel fuel. The company tracks all tank emissions using the EPA's Tank 4.09d software. A review of their most recent tank emissions records showed the tanks were operated in compliance with the permit's material usage limit of 1,638,000 gallons of gasoline per 12-month rolling time period. Their most recent records showed that the gasoline throughput for the most recent 12-month time period was 78,926 (previously 332,499) gallons. Emissions from the 8 tank entries on the spreadsheet showed emissions of 25,588 lbs for July 2017 through June 2018 (previously 745 pounds of VOC for January 2015 through December 2015). Although this seems like a very significant change as emissions are way up in the standing loss category. The facility did appear to have a significant portion of the vehicles produced being the Chevy Bolt, which requires no gasoline addition. See Attachment for the most recent tank emissions records.

FG-OLDFACILITY, MACT EEEE

The methanol (windshield washer) tank is subject to NESHAP EEEE. The company demonstrates compliance with NESHAP EEEE by maintaining vapor pressure records. No reporting is required unless the events in FG-OLDFACILITY special condition VII.5(a) or (b) become applicable. No tanks have become subject to control and no tank greater than 5000 gallons have become part of the affected source under Subpart EEEE.

FG-FACILITY

GM Orion tracks usage of all materials used at the facility through a chemical management system. They use

Method 24 results supplied by the manufacturer to determine the VOC content of coatings. The company follows the EPA Auto Protocol (EPA-453/R-08-002 September 2008) to calculate emissions. A copy of the most recent auto protocol reviews dated 9/9/2016 and 9/5/2017 is attached to this report and demonstrate that no significant changes have occurred since the last stack tests were conducted in 2011 and 2012.

Attachments to this report document the company's VOC emissions records for July 2017 through June 2016. The records show that the company is in compliance with the permit limit of 748.5 tons VOCs per 12-month rolling time period. Review of the 2017 MAERS submittal shows the facility emitted 68.3 tons VOC for 2017, well below the permit limit. Review of the VOC records for July 2017 through June 2018 shows VOC emissions of 58.05 tons for the 12- month rolling time period.

EU-NATURAL GAS

Records from July 2017 through June 2018 were obtained and reviewed. A copy of this record is attached to the hard copy of this report. The records demonstrate that the company is in compliance with the permit limit of 40 tons NOx per 12-month rolling time period. Records from June 2018 show that 21.24 tons of NOx (excludes landfill engines) were emitted during the preceding 12-month rolling time period. The also company maintains records to show that they operate in compliance with the permit limit of 800 MMCF per 12-month rolling time period. Records from July 2017 through June 2018 show that 303.41 MMCF was used during the 12-month rolling time period.

PM-10 Records from July 2017 through June 2018 show that the company is in compliance with the permit limit of 20.3 tons PM-10 per 12-month rolling time period. Specifically, December 2015 records show that they emitted 1.15 tons of PM-10 were emitted during the preceding 12-month rolling time period (see Attachment). PM-10 emissions from the following processes are summed together to determine compliance with the permit PM-10 emission limit: natural gas combustion in the paint operations (including the RTO) and the assembly operations, the EU-COAT Scuff Booth, the spray booths of EU-THREE WET, and EU-FINAL REPAIR. The limit does not include the facility's boilers, which are covered under the ROP.

FG – MACT, Subpart III

Hazardous air pollutants (HAPs) are emitted during clear coat application (in EU-THREE WET & EU-FINAL REPAIR), sealer & adhesive application (in EU-SEALERS & EU-GLASS INSTALL), and solvent & purging activities (in EU-PURGE&CLEAN). The company maintains a Work Practice Plan (WPP) for the Minimization of Organic HAP Emissions, as required by NESHAP III. The WPP details the company's plan to minimize HAP emissions from the storage, mixing, and conveying of coatings, thinners, and cleaning materials used in, and waste materials generated by, all coating operations for which emission limits are established under NESHAP III. A copy of the WPP is attached to the hard copy of this report.

GM Orion maintains records of HAPs to demonstrate compliance with the emission limits specified in the NESHAP and in MI-ROP-B7227-2015a. The facility has eliminated almost all HAP materials as the last months of 2015 reported little to no HAP at all. Manufacturer supplied HAP content is used to calculate HAP emissions. Attached to this report are HAP emissions records demonstrating compliance with the NESHAP emission limits for July 2017 through June 2018.

Pollutant	MACT Limit	Actual Emissions
		June 2018
HAP – PS, Topcoat, Glass Install, Final Repair	0.5 lbs HAP/GSA	0.01 lbs HAP/GSA (previously 0.9)
HAP – Sealers and Adhesives	0.01 Lbs HAP/Lb material	0.00 Lbs HAP/Lb material
HAP – Deadener	0.01 Lbs HAP/Lb material	0.00 Lbs HAP/Lb material

GM uses the compliance method specified in 63.3091(b) which is the combined emissions from primer surfacer, topcoat, final repair, glass bonding primer and glass bonding adhesives. Electrodeposition is excluded from the grouping per 63.3092(a) since it contains no more than 1.0 percent by weight of any organic HAP and no more than 0.1 percent by weight organic HAP which is a carcinogen.

Powerhouse **FG-BOILERS**

The company has four boilers which are used for building heating/cooling and process heating. FGBOILERS are covered by Section 1 of ROP No. MI-ROP-B7227-2015a. Boiler 1 has a heat rating capacity of 82 MMBTU/hr and combusts natural gas. Boiler 2 has a capacity of 248 MMBTU/hr and is capable of combusting either natural gas or landfill gas. Boilers 3 & 4 have been decommissioned and have been removed from the ROP. Boiler 2 is the primary boiler used at the facility. The company also runs Boiler 1 on natural gas to back up Boiler 2 or for smaller loads.

FG-BOILER MACT, Subpart DDDDD

The facility is allowed to burn landfill gas in Boiler #2. As a result of this the company was required to determine, by testing, the amount of mercury in the fuel (**40 CFR 63.7521(i)**). On March 31, 2011 a letter was provided from BTEC Inc., consulting discussing the test results from mercury testing. The letter is confusing because of the date drafted and the applicability date of the standard (January 31, 2016). The letter dated March 2011 also further goes on to state the testing was conducted on January 19, 2016. However, the results were 1.45 micro grams per dscm, well below the permit requirement 40. This is also way less than half of that limit, so per 63.7540(c)(1), the company does not need to conduct further sampling.

FG-RICE MACT, MACT ZZZZ, NSPS JJJJ (emergency engines)

The company has 8 emergency generators, see attachment for a list of generators. This list includes the following information: the type of generator, exemption under Rule 285(g), the installation date, generator size, emergency generator or fire pump use. There is also a listing of the current hours for each engine attached to this report. All hours are below the 100 hours per year for both maintenance/testing and emergency operation. Emergency hours do not count towards the 100 hours. A listing of all the hours and use for each of the 8 engines is attached to this report for January 2018 through July 2018.

For the 5 landfill gas engines, a copy of the daily fuel use records and the volumetric flow rate (in MCF) of landfill gas used in each engine is attached to this report for August 20, 2018 through August 27, 2018.

FG-ENGINES (5 LFG engines)

The GM Orion facility previously obtained PTI 86-13 for 5 Land Fill Gas (LFG) fired engines to generate electricity. PTI 86-13 was rolled into the ROP on September 29, 2015. The LFG comes from the 2 nearby landfills operated by Republic and Waste Management. The emission limits within FG-Engines were currently being re-verified with stack testing during this week of the scheduled inspection. The engines must verify emissions every 8,760 hours or every 3 years, whichever comes first. The company has submitted an approved Malfunction Abatement Plan which is currently on file in the district office. The engines are equipped with lean burn technology (air to fuel ratio of 5:1 up to 9:1) and an observation of the current operating parameters for engine 1 showed the actual operating ratio was at 7.2:1.

Based upon information received regarding the hydrogen sulfide in the landfill gas received from the Oakland heights Landfill a discussion was had regarding SO₂ emissions from the landfill gas engines. The original PTI assumed 250 ppm hydrogen sulfide while testing over the last year showed the Oakland Heights Landfill to be exceeding the 400 ppm hydrogen sulfide permit limit. A review of the data from the landfill shows the 12 month rolling averages (approximately weekly testing) over 400 ppm for the 12 months ending February 2018 through the last month of data July 2018. The original PTI evaluated 26 tpy of SO₂ emissions, however based upon the Oakland Heights data emissions would likely exceed 40 tpy if the engines operated near 8760 hours per year. I told GM this appears to be a Rule 201 violation because of the increased SO₂ which was not evaluated at the levels during the issuance of the PTI. GM also mentioned they receive gas from Republic as well, so this would not be the entire picture. I suggested GM conduct a test to determine the content of hydrogen sulfide as received at their plant. GM will be following up within 2 weeks of the inspection to go over what they have discovered and how they may want to proceed.

Compliance Determination

As a result of the inspection, it appears that GM Orion is operating in compliance with MI-ROP_B7227-2015a

except for the landfill gas engine issue mentioned above. GM is supposed to provide a response to concern by September 12, 2018. As such, this reports compliance status will be marked unknown compliance until a response is received. It is likely this report will be changed to non-compliance for a Rule 201 violation of PTI 186-13 for not evaluating the appropriate amount of SO2 emissions.

NAME Robert Byrnes

DATE 9/10/18

SUPERVISOR Joyce St