FCA US LLC
Sterling Heights Assembly Plant

Permit No.: MI-ROP-B7248-2014a

Revised 2018

Malfunction Abatement Plan

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1.0 Purpose and Use

This Malfunction Abatement Plan was developed in accordance with Michigan Department of Environmental Quality R336.1911, Renewable Operating Permit Number MI-ROP-B7248-2014a Issued November 19, 2014, and Permit to install 27-17B for the regenerative thermal oxidizers, water wash systems and dry particulate control devices used to control emissions from the Electro coat and Paint process at FCA Sterling Heights Assembly Plant (SHAP). The purpose of the malfunction and abatement plan is to prevent, detect and correct malfunctions or equipment failures that may result in volatile organic compound (VOC) or particulate matter (PM) emissions exceeding any applicable emission limitation.

This plan includes a description of the following elements, consistent with the requirements established in state regulations (Michigan Air Pollution Control Rules, R336.1911) for malfunction abatement plans:

- The preventive maintenance program for the pollution control equipment;
- The operating variables that are monitored to detect a malfunction; and
- A description of corrective maintenance procedures and/or operational changes to be made in the event of a malfunction.

2.0 Applicability and Control Device List

This plan applies to the regenerative thermal oxidizers (RTOs), water wash system, and dry particulate filter systems at SHAP. The sources and applicable Air Pollution Control Equipment are defined in Table 1 and Table 2 for the North Paint Shop and South Paint Shop, respectively.

Table 1
North Paint Shop List of Sources and Air Pollution Control Equipment

Emission Unit	Applicable Air Pollutant Control Equipment
Electro coat Oven 1 and 2	RTO
Topcoat Color 1N, 2N and 3N Oven	Water Wash System and RTO
Color Prep	Dry Filters
Primer Booth	Dry Filters
Paint Spot Repair	Dry Filters

Table 2
South Paint Shop List of Sources and Air Pollution Control Equipment

Emission Unit	Applicable Air Pollutant Control Equipment
Electro coat Oven 1S and 2 S	RTO
Topcoat Color 1S and 2S Oven	Water Wash System and RTO
Topcoat Sanding Booth S	Dry Filters
Ecoat Sanding Booth S	Dry Filters
Powder Coating S	Dry Filters
Spot Repair 1S and 2S	Dry Filters
Heavy Repair S	Dry Filters

3.0 Preventive Maintenance Program

This section describes the procedures for maintaining the regenerative thermal oxidizers, dry filter system and auxiliary equipment: the frequency of inspection, the activities undertaken, and the personnel responsible for overseeing inspection, maintenance and repair of this equipment.

3.1 Preventive Maintenance Activities

The preventive maintenance activities for the regenerative thermal oxidizer were originally established using the manufacturer's recommended general and preventive maintenance procedures, and have since been refined based on operational and maintenance experience with the regenerative thermal oxidizer as well as sound engineering practice in accordance with industry standards.
The maintenance and inspection activities records are maintained electronically in the plant's Total Maintenance System (TMS) at least for one year. Environmental Specialist review PM records on monthly basis and hardcopy printout are kept in PM Binder at Environmental Specialist Cubicle. Table 3 summarizes the preventive maintenance activities and associated frequencies.

A list of replacement parts for the regenerative thermal oxidizer system that are inventoried, used and periodically re-stocked is provided in Table 4.

3.2 Preventive Maintenance Responsible Personnel

The following personnel share responsibility for ensuring that the inspection and maintenance activities for the regenerative thermal oxidizer are completed:

- Paint Shop Maintenance Manager
- Maintenance Supervisor Manager
- Facility Engineers

- Millwrights, Pipefitters and Electricians

Table 3
Summary of Preventive Maintenance Activities

Frequency	Preventive Maintenance Activity
Regenerative Thermal Oxidizer	
Weekly	• Abatement fan temperature and vibration check • Exhaust fans variable-frequency drive (VFDs) inspection
Monthly	• Changeover hydraulic pump to standby • Inspect shut off valves and high/low pressure switches for gas train burners • Test exhaust fan backup motor
Quarterly	• Inspect gas train for leaks and ensure gages are operational • Fan and electric motor maintenance • Inspect air conditioner coils and filters
Every 4 Months	• Inspect dampers and air connection hoses
Semi-Annually	• Check operating controls alarms and safety systems • Inspect inlet and exhaust ductwork • Hydraulic pump oil analysis
Annually	• Inspect internal and external insulation, combustion chamber internal sensors, and chimney stack. • Clean sensors, burner nozzles, chamber surfaces, door seals • Check process exhaust system including damper interlocks • Inspect external structure for hot spots or damage • Inspect proximity switches and conduit cables and connections • Inspect thermocouples for damage and deterioration. Replace as necessary • Replace gas train filter
Every Two Years	• Change hydraulic oil and filter
Dry Particulate Filters	
Monthly	• Pressure drop monitoring and filters replaced as needed
Water Wash Systems	
Daily	• Booth flood plan check
	Regenerative Thermal Oxidizer (RTO)
	• Electronic monitoring of RTO temperature in Factory Information System (FIS) every fifteen minutes daily

Table 4
Major RTO Replacement Parts

Pressure switches
Fan Bearing Temperature Thermocouples
Flushing Fan belts
Ignitors
Gaskets
Flushing Fan Motor
Thermocouples

4.0 Operating Parameters and Malfunction Detection

Regenerative Thermal Oxidizer Performance Monitoring and Malfunction Detection

RTO is pollution control device for E-Coat System, Spray booths and Bake Ovens and normal operating conditions are defined in terms of the following parameters:

- The operating temperature is established during recent regulatory testing for Destruction Efficiency.
- The temperature is electronically recording every 15mins in **SHAP FIS**
- No by-pass valve or stack dampers open to the atmosphere during production
- In event **SHAP FIS** data logger offline, operator manually recording the data every hour as a back up
- If RTO operating temperature drops below the setpoint, the conveyor system leading into paint spray booths or / and Ecoat system are interlocked thus preventing vehicles from proceeding into listed emission source.
- The Spray booths, Ovens and Ecoat system are stripped of vehicle already in the system prior to the incident

5.0 Malfunction Operating Scenarios

Permit conditions, Michigan Air Pollution Control rules and federal requirements that Regenerative thermal oxidizers are operating at certain temperature during production hours. An “Upset Condition” or reportable malfunction occurs when RTO malfunction occurs as defined in these regulations.

In the event RTO operating temperature falls below Setpoint, during production or just prior to production startup, production stop interlock must be activated in various entrance stage of the processes as listed below:

- Prior to tack off zone for all Spray booths and Ovens
- Phosphate Pre-cleaning stage for Ecoat system and Oven

Vehicles stranded within process prior the incident are stripped out and production do not resume until RTO operating temperature is back to setpoint

The Paint Maintenance manager, through each shift Paint Maintenance Supervisors is responsible for maintaining the RTO in accordance with all Federal and Michigan State rules and permit conditions.

It is responsibility of the Paint Maintenance Manager and Paint Maintenance Supervisors to notify the EH&S Environmental Specialist if RTO drops below normal operating temperature

The Environmental Specialist will notify the Michigan Department of Environmental Quality of a reportable malfunction of a regenerative thermal oxidizer, as required pursuant to Michigan Rule R336.1912 and ROP # MI-ROP- B7248-20014a.

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