AAR Mobility Systems

AAR MOBILITY SYSTEMS

MALFUNCTION ABATEMENT MAP & SSMP
1.0 INTRODUCTION

This MAP/SSMP has been prepared pursuant to: Rule 911 & 40 CFR 63.6(e)(3).

Rule 911.

(1) Upon request of the department, a person responsible for the operation of a source of an air contaminant shall prepare a malfunction abatement plan to prevent, detect, and correct malfunctions or equipment failures resulting in emissions exceeding any applicable emission limitation.

(2) A malfunction abatement plan required by subrule (1) of this rule shall be in writing and shall, at a minimum, specify all of the following:

(a) A complete preventative maintenance program, including identification of the supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air-cleaning devices, a description of the items or conditions that shall be inspected, the frequency of the inspections or repairs, and an identification of the major replacement parts that shall be maintained in inventory for quick replacement.

(b) An identification of the source and air-cleaning device operating variables that shall be monitored to detect a malfunction or failure, the normal operating range of these variables, and a description of the method of monitoring or surveillance procedures.

(c) A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

Operation and maintenance requirements. **(40 CFR 63(e))**

At all times, including periods of startup, shutdown, and malfunction, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. During a period of startup, shutdown, or malfunction, this general duty to minimize emissions requires that the owner or operator reduce emissions from the affected source to the greatest extent which is consistent with safety and good air pollution control practices. The general duty to minimize emissions during a period of startup, shutdown, or malfunction does not require the owner or operator to achieve emission levels that would be required by the applicable standard at other times if this is not consistent with safety and good air pollution control practices, nor does it require the owner or operator to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures (including the startup, shutdown, and malfunction plan required in paragraph (e)(3) of this section), review of operation and maintenance records, and inspection of the source.

Malfunctions must be corrected as soon as practicable after their occurrence. To the extent that an unexpected event arises during a startup, shutdown, or malfunction, an owner or operator must comply by minimizing emissions during such a startup, shutdown, and malfunction event consistent with safety and good air pollution control practices.

Operation and maintenance requirements established pursuant to section 112 of the Act are enforceable independent of emissions limitations or other requirements in relevant standards.

Startup, shutdown, and malfunction plan. **(40 CFR 63(e)(3))**

The owner or operator of an affected source must develop a written startup, shutdown, and malfunction plan that describes, in detail, procedures for operating and maintaining the source during periods of startup, shutdown, and malfunction; and a program of corrective action for malfunctioning process, air pollution control, and monitoring equipment used to comply with the relevant standard. The startup, shutdown, and malfunction plan does not need to address any scenario that would not cause the source to exceed an applicable emission limitation in the relevant standard. This plan must be developed by the owner or operator by the source's compliance date for that relevant standard. The purpose of the startup, shutdown, and malfunction plan is to -

(A) Ensure that, at all times, the owner or operator operates and maintains each affected source, including associated air pollution control and monitoring equipment, in a manner which satisfies the general duty to minimize emissions established by paragraph (e)(1)(i) of this section;

(B) Ensure that owners or operators are prepared to correct malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of hazardous air pollutants; and

(C) Reduce the reporting burden associated with periods of startup, shutdown, and malfunction (including corrective action taken to restore malfunctioning process and air pollution control equipment to its normal or usual manner of operation).

2.0 SOURCE DESCRIPTION

The emission sources, air pollution control equipment, and affected emissions from the facility are as follows:

EMISSION SOURCE	CONTROL EQUIPMENT	EMISSIONS CONTROLLED
EUBALSACORE	RTO/WOOD BAGHOUSE	VOC/PARTICULATE
EUCONTAINER	RTO/FABRIC FILTER	VOC
EU197LINE	RTO	VOC
EUSKINorRAIL	RTO	VOC
EULMS	ALUMINUM CHIP COLLECTOR	PARTICULATE
EUWOODROOM	WOOD BAGHOUSE	PARTICULATE

3.0 PREVENTATIVE MAINTENANCE PROGRAM (Rule 911(2)(a))

3.1 Responsible Personnel

The responsible personnel for the preventative maintenance program at AAR Mobility Systems are as follows:

POSITION	RESPONSIBILITY
General Manager & Operations V.P.	Overall operations and maintenance, Responsible Official
Operations Manager	Overall control of the facility and machinery maintenance
EHS/Facility Manager	Pollution control, machinery maintenance equipment monitoring oversight
Maintenance Supervisor	Direct control of preventive maintenance, corrective actions, Start Up, Shutdown, Malfunction response, routine inspections
Production Supervisor	Daily Equipment inspections, Daily Operator Paint Booth Log audits.
Maintenance Personnel	Preventative maintenance inspections, repairs, spare parts inventory

3.2 Equipment Inspections

The financial success of the AAR Mobility Systems will depend on proper operation, start up, and shut down of the equipment to ensure reliability, availability, efficiency and long term production. Preventative maintenance is a key component to ensuring the reliability, availability, efficiency and production of the facility.
Preventative maintenance will include equipment inspections and calibrations, scheduled replacement of parts and maintaining an inventory of critical spare parts.
Equipment inspections generally fall under two categories: inspections that take place while the facility is operating and inspections that take place when the facility is experiencing malfunctions.

The inspections that take place during facility operation typically occur on a daily, weekly, monthly, quarterly semi-annual or annual basis. The frequency and scope of these inspections will depend on manufacturer recommendations, operator experience and as the Maintenance Supervisor has scheduled in AAR Mobility Systems electronic maintenance management system (Maintimizer, AAR Mobility System ISO Procedure-7.3 Facilities & Preventive Maintenance)

The following spare parts are purchased and stored in inventory based on plant operating experience.

AIR CONTROL DEVICE	ITEMS INSPECTED	INSPECTION FREQUENCY	CRITICAL PARTS INVENTORY
RTO	Gas Control Valve	Monthly	1
	Atlas - Damper Cylinders	Monthly	3
	Calibrated Combustion Chamber Thermocouple P/N K88U-024-00-8RNDC93	Quarterly Calibration	6
	Allen Bradley - Inductive proximity switch P/N C10A30-A	Monthly	4
	Calibrated Exhaust Thermocouple JP48G-024-VCL-F1006-2/8HN-CC-250-SC	Quarterly Calibration	3
	GE Fanuc - Input output P/N 1C693MDL330B	Monthly	2
	Square D - micro switch P/N BZG1-2RN2-0113	Monthly	1
	Square D contact relays P/N NR51-52	Monthly	2
	Buss fuses P/N FRSR20	Monthly	2
	Honeywell - automatic burner control P/N RM7890A1015	Monthly	1
	Honeywell - gas/air pressure switch P/N C437F 1045	Monthly	1
	Red Hat valves P/N 8210G15	Monthly	2
	Honeywell - flame detector P/N C7035A 1031	Monthly milliamp check	5
	Crown Burner Ignitor P/N CA311	Change with flame detector	5
	Hydraulic lines	Monthly	2
	Faulk - cover grid assy. drive coupling P/N 1070T10	Monthly	2
RTO	Webster - Ignition transformer P/N 612-6A020	Monthly	3
	Honeywell - FSG protector relay P/N RA890F 1288	Monthly	1
WOOD BAGHOUSE	Drive Belt P/N 5V1250	Weekly	4
	Drive Bearings P/N MP 47	Weekly	2
	60 HP Main Motor	Weekly	1
ALUM. CHIP COLLECTOR	Drive Belt P/N BX 46	Weekly	2
	Drive Bearing P/N MP 27	Weekly	2
	Vac Hose 8" Clear	Weekly	25'
PAINT/ ADHESIVE BOOTH	Dwyer NIST Calibrated Magnehelics Model 2000-00N -0.125 to +0.125 Inches W.C.	Daily/ Monthly Calibration	6

4.0 OPERATING VARIABLES TO BE MONITORED (Rule 911(2)(b))

The operating variables AAR Mobility Systems will monitor are:

CONTROL EQUIPMENT	OPERATING VARIABLES	NORMAL OPERATING RANGE	METHOD OF MONITORING
RTO	Temperature	1500 Degrees F to 1400 F	Automated chart recorder & audio/visual alarm
RTO	Pressure Drop	2 - 2.5	Machine control panel
WOOD BAGHOUSE	Pressure Drop	2- 2.5	Magnahelic gauge
ALUMINUM CHIP COLLECTOR	Pressure Drop	2 - 6	Magnahelic gauge

5.0 CORRECTIVE PROCEDURES (Rule 911(2)(c))

AAR Mobility Systems is required to comply with the Rule 912 immediate reporting requirements in the case of excess emissions in exceedance of the emission limits in excess of specified periods. Deviations from the MAP/SSMP requirements and emission limits will be reported in semi-annual and annual deviation reports. Additional procedural steps outlined in RTO Operations Plan.

CONTROL EQUIPMENT	OPERATING VARIABLES	MALFUNCTION	CORRECTIVE ACTION
ALL EQUIPMENT		Failure to achieve compliance with applicable emission limits	Safely shutdown and implement repairs to achieve compliance with applicable emission limits as soon as practicable; if cannot achieve within a reasonable time then shut down. * See RTO Operation Plan
RTO	Temperature	Temp drop below 1400	Initiate re-start program
RTO	Pressure Drop	Pressure drop – Low	Initiate re-start. If conditions continues, isolate low can, inspect for leaks.
	Pressure Drop	Pressure Drop - High	Initiate re-start. If conditions continues, initiate cleaning cycle
WOOD BAGHOUSE	Pressure Drop	Pressure drop – Low	Initiate re-start. If conditions continues,, inspect for leaks, empty bag.
	Pressure Drop	Pressure Drop - High	Initiate re-start. If conditions continues, initiate cleaning cycle
ALUMINUM CHIP COLLECTOR	Pressure Drop	Pressure drop – Low	Initiate re-start. If conditions continues,, inspect for leaks, empty bag.
	Pressure Drop	Pressure Drop - High	Initiate re-start. If conditions continues, initiate cleaning cycle

Permit Emission Limits

Renewable Operating Permit # **MI-ROP-B4197-2016c**

Emission Units Requiring RTO Control
Emissions from the following processes are captured and sent to the RTO to be destroyed: CONTAINERLINE, LMS (EU197LINE) Paint Lines and associated Ovens, Adhesive Spray Booths SKINORRAIL and BALSACOR. Under normal conditions, the RTO must be operating at the combustion chamber set point temperature of 1500F and must be maintained at a minimum of 1400°F. If this is the case, CONTAINERLINE, LMS (EU197LINE), SKINORRAIL and BALSACORE may be operated at normal rates.
Coatings, regardless of VOC content, containing p-chloro-benzofluoride (PCBTF-CAS# 98-56-6) shall not be used and exhausted to the RTO.

Emissions Limit (VOC): FG Coatings- 122.3 tons per year (12-month rolling time period), EUCONTAINERLINE- 8.2 tons per year, 0.9 tons per year- Diglycidyl ether of bisphenol a (CAS No 25036-25-3). Cleanup Solvent Emissions – 1.7 tons per year (12-month rolling time period). Monitoring Requirements: Monitor and record temperature from the RTO in the combustion chamber. See current permit **AAR ROP-B4197-2016c/PTI 163-07C**.

Emission Units Not Requiring RTO Control
AAR ROP-B4197-2016a has permitted emission units in which AAR Mobility Systems Cadillac can operate **without RTO control**, EU197LINENOCTRL and EUCONTNRNOCTRL. The RTO control system is by-passed during operation for EU197LINENOCTRL, EUCONTNRNOCTRL.

Emissions Limits (VOC): EU197LINENOCTRL can by-pass the RTO when using coatings with a VOC content less than or equal to 2.8 lbs VOC per gallon, coatings containing PCBTF p-chloro-benzofluoride (CAS# 98-56-6) limits added at 105.2 pounds per day, 12.3 tons/year (12-month rolling time period). EUCONTNRNOCTRL can by-pass the RTO when using coatings with a VOC content less than or equal to 3.5 lbs VOC per gallon, coatings containing PCBTF p-chloro-benzofluoride (CAS# 98-56-6) limits added at 256.0 pounds per day, 24.3 tons per year (12-month rolling time period). See current permit.

RTO OPERATIONS PLAN

If the RTO is voluntarily **shut down**, all Paint, Adhesive Booths and associated Ovens will be shut down in advance of the voluntary shut down.

If the RTO experiences a **startup** malfunction, no Paint, Adhesive Booths or associated Ovens will be started until issue is corrected and the RTO is back at minimum Oxide Temperature of 1400F. Additionally, if at the start of a shift the RTO is down, no Paint, Adhesive Booths or associated Ovens will be started until issue is corrected and the RTO is back at minimum Oxide Temperature of 1400F. < 1400F interlocks are programmed so adhesive pumps to spray guns are shut off and the plant Booths and site wide alarm system is activated.

During plant startup and shutdown the plant is operated by properly trained personnel who will operate the facility in accordance with the manufacturer's recommendations and plant operating procedures. During a normal plant startup and shutdown AAR will have a maintenance crew on duty to provide constant monitoring of the RTO and associated equipment.

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When the RTO shuts down due to a **malfunction**, the processes can be operated at normal production rates while the RTO is above the minimum Oxide temperature of 1400F. Maintenance Supervisor is notified by wireless message when the RTO shuts down at <1400F. The Maintenance Supervisor will notify Maintenance Personnel to trouble shoot the malfunction and restore the RTO back to the operating set point Temperature of 1400F.

The CONTAINERLINE, SKINORRAIL, BALSACORE and LMS (EU197) Production Supervisors will also be notified by the Maintenance Supervisor that the RTO has shut down when <1400F. When the RTO reaches the minimum RTO Oxidize Temperature of <1400F, the Plant monitoring system provides plant Paint and Adhesive Booths a visual and audible alarm. 1400F is the temperature at which the Plant monitoring system provides plant Paint and Adhesive Booths a visual and audible alarm. < 1400F interlocks are programmed so adhesive pumps to spray guns are shut off. When the alarm is activated all Paint, Adhesive Booths will stop spraying paint and adhesive. Ovens can be operated to complete curing parts or articles that were in the Oven prior to the temperature excursion and must be shut down after parts/articles are cured.
In the event that a malfunction should occur to the RTO or related pollution control equipment that affects the control of the plants emissions and causes the plant to exceed the permitted levels, specific action will be taken to bring the plant back into compliance, which will include:

- As of January, 2018 AAR Mobility Systems Cadillac abatement measure to minimize the risk for exceeding any emission limit for the RTO or associated pollution control equipment does not include running under a reduced rate scenario(s). AAR Mobility Systems Cadillac abatement measure is to correct the malfunctioned equipment by taking it out of service for repairs.

- Whenever needed, the use of overtime, off-shift labor, outside contractors, will be used to minimize the duration of the malfunction event or excess emissions.

Excursion events <1400F:

Operations Supervisors or Paint Booth Operators must note on the Paint Booth log sheet the date, shift and time when a Paint Booth or Adhesive Line was operating during a temperature excursion of <1400F.
Operations Supervisors or Paint Booth Operators shall include the quantity of paint, adhesive or thinner used if paint spraying or adhesive operations continued during the temperature excursion.
As soon as practical, but no later than 24 hours notify the Operations Manager, ESH/Facility Manager or Senior Safety Specialist when a Booth has operated (paint spraying or adhesive operations continued) during a temperature excursion of <1400F.

B. Verification of Operational Status-Operations Supervisors or Paint Booth Operators will note on the paint log, date, shift and time the Paint Booth or Adhesive Line returned to normal operation for all Oxide Temp excursions <1400F and shall log date, shift and time when RTO is back operating, > 1400F.

Definitions:

Malfunction

Malfunction means any sudden, infrequent, and not reasonably preventable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

Startup

Startup means the setting in operation of an affected source (Paint, Adhesive Booth) or portion of an affected source for any purpose.

Shutdown

Shutdown means the cessation of operation of an affected source ((Paint, Adhesive Booth) or portion of an affected source for any purpose.

Monitoring Approach

The key element of the monitoring approach for VOC is presented below. The selected indicator of performance is the combustion chamber temperature. The temperature is measured continuously while the RTO is in operation and recorded on a circle chart.

MONITORING APPROACH

	Indicator
1. **Indicator**	RTO Combustion Chamber Outlet Temperature, 1500F set point for normal operating conditions.
Measurement Approach	The Temperature is measured using three calibrated Thermocouples located in the Combustion Chamber.
2. **Indicator Range**	A malfunction/excursion has occurred when the combustion chamber outlet temperature drops below 1400°F. An excursion will result in implementation of the Start Up, Shut Down Malfunction Plan.
3. **Performance Criteria**	The RTO combustion chamber outlet temperature is measured using three calibrated thermocouples located in the combustion chamber. The minimum acceptable accuracy for the thermocouples is 5F or ±1 percent of the measured value and the range is 0 to 1600°F.
A. Data Representativeness	
B. Verification of Operational Status	Daily-Field inspection for the RTO continuous temperature monitoring recording chart and maintaining temperature monitoring system that provides plant Paint Booths a visual and audible alarm when the RTO combustion chamber outlet temperature drops below 1400°F.
C. Quality Assurance and Control Practices	Quarterly calibration and inspection for each of the three thermocouples and after each excursion. Acceptance criteria: 5F or ±1 percent of the measured value.
D. Monitoring Frequency	The RTO combustion chamber outlet temperature is measured and recorded continuously during RTO operation.
Data Collection Procedure	The RTO combustion chamber outlet temperature is recorded continuously.
Averaging Period	NA AAR has Circular temp reading chart only

The Title V Air Permit for the RTO requires that the monitoring approach procedure be followed. Deviation from this procedure may result in a violation of the permit.

Rev #8 Rev Date: 4-22-2019 Approved: Plant Manager, Operation
VP, Operations Manager.

Reporting (Rule 912 Reporting)
Notifications will be provided to the DEQ-AQD Cadillac district supervisor of any abnormal conditions or malfunctions of process or control equipment that results in emissions in violation of the Air Use Permit or Rule 912 (refer to Rule 912). This notice will be provided not later than two business days after the startup, shutdown, or discovery of the abnormal condition or malfunction. Also, within 10 days, a written detailed report including probable causes, duration of violation, remedial action taken, and the steps which are being taken to prevent a reoccurrence will be submitted to the DEQ-AQD district supervisor.

RTO temperature monitoring data, paint booth records, emissions recordkeeping, and preventative maintenance records for the RTO, associated equipment will be kept on file at the plant for a period of fire years and made available to the DEQ-AQD district supervisor upon request.

6.0 DEPARTMENT APPROVAL Rule 911(3)(4)

(3) A malfunction abatement plan required by subrule (1) of this rule shall be submitted to the department and shall be subject to review and approval by the department. If, in the opinion of the commission, the plan does not adequately carry out the objectives as set forth in subrules (1) and (2) of this rule, then the department may disapprove the plan, state its reasons for disapproval, and order the preparation of an amended plan within the time period specified in the order. If, within the time period specified in the order, an amended plan is submitted which, in the opinion of the department, fails to meet the objective, then the department, on its own initiative, may amend the plan to cause it to meet the objective.

(4) Within 180 days after the department approves a malfunction abatement plan, a person responsible for the preparation of a malfunction abatement plan shall implement the malfunction abatement plan required by subrule (1) of this rule.

7.0 REVISIONS

Revision Change:	Original Rev #3	Date
G.Shay	Rev #4 updated pressure drop from 2-4 for LMS Cyclone to reflect the CAM Plan indicator ranges of 2-6.	9/10/2014
G.Shay	Rev #5 Changes to RTO Operations Plan due to malfunction event on 12/12/18 and 1/4/18 per 40 cfr 63.1111(5), added Monitoring Approach, and additional Personnel responsibilities.	1/22/2018
G.Shay	Rev #6 RTO Thermocouple Part Number updated to Type K	4/24/2018
G.Shay	Rev#7 RTO Stack Test DE at RTO Operating Temp Avg temp of 1438F	10/22/2018
G.Shay	Rev#8 PTI 163-07C PTI modify the MACT Requirements Containerline with RTO Control	4/22/2019