



**Preventative Maintenance &
Operation Plan
for
Muskegon River Compressor Station
EUAUXGEN1A & EUAUXGEN2A**

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1.0 Plan Overview

The purpose of this Preventative Maintenance & Operation Plan (“Plan”) for Stationary Emergency and Black Start Compression-Ignition (CI) and Spark-Ignition (SI) Reciprocating Internal Combustion Engines (RICE) is to describe the emissions control-related operational and preventative maintenance actions that will be taken to assure compliance with the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary RICE, 40 CFR Part 63 Subpart ZZZZ requirements. [63.6625(e)]

This Plan may be superseded by implementing the requirements within the manufacturer’s emission-related written instructions for any subject emission unit.

This Plan is not intended to address all preventative maintenance checks or actions that are recommended by a manufacturer, insurance carrier or otherwise required to be conducted by the Company for purposes of assuring startup and operation of an engine.

The current Plan will be available electronically within the Environmental Manual AQ-290 procedure entitled “Emergency & Black Start Reciprocating Internal Combustion Engines (RICE),” as well as posted on Environmental Services’ SharePoint page under the Technical Documents library which may be found at the following link: (<http://docs.cmsenergy.com/gen/Environmental/TechnicalDocs/Forms/AllItems.aspx>).

The current Plan, and prior versions, must be maintained for a period of five (5) years and made available upon request of an Agency.

The Field Leader is responsible for assuring that the most recent copy of this Plan is made available to personnel involved with each engine’s operation, maintenance and readiness testing activities. This includes ensuring that the necessary employees are aware / trained in the procedures and requirements contained in this Plan and the AQ-290 procedure.

2.0 Equipment Covered by Plan

This Plan covers EUAUXGEN1A & EUAUXGEN2A located at the Muskegon River Compressor Station. These engines are classified as existing, natural gas-fired (i.e. spark-ignition), emergency stationary RICE >500 hp.

3.0 Engine Operation

All RICE must be installed, maintained and operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require reduction of emissions to levels beyond those required by the NESHAP regulation [63.6605(b)].

In the absence of specific emission limits and compliance testing requirements for stationary emergency RICE, implementation of this Plan will be relied upon as the basis for assuring regulatory compliance.

Engine settings:

All stationary emergency RICE following their manufacturer's emissions related written instructions must be installed, configured, operated and maintained accordingly (if available). Do not change any emissions related control settings unless authorized by the manufacturer. This will likely void the engine's emissions certification and subsequently require emission testing to demonstrate continued regulatory compliance.

Engine Startup and Idle:

All stationary emergency RICE must adhere to the following operational restrictions:

- Minimize the engine's time spent at idle during startup
- Minimize the engine's startup time to a period needed for appropriate and safe loading of the engine
- Do not exceed 30 minutes of startup [63.6625(h)]

Emergency Operation:

An emergency engine may be operated for unlimited duration in the event of an emergency situation. Examples of an emergency include use of a stationary RICE to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc..

Maintenance & Readiness Testing:

An emergency engine may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. The engine may not be operated for these purposes in excess of 100 hours per calendar year.

Other Non-Emergency Operation:

Operation outside of emergency situations, maintenance and readiness testing is strictly constrained. Contact Environmental Services-Air Quality Section to discuss compliance requirements for other operating circumstances.

Operation Log:

A log of the hours of operation of each engine shall be maintained to document compliance. The log must include how many hours are spent for emergency operation, maintenance, readiness testing, and non-emergency operation (if applicable), as well as what constituted the emergency operation. Verify hourly limitations have not been exceeded on a calendar year basis. See the AQ-290 RICE procedure or your site-specific RICE procedure (if applicable) for details.

4.0 Engine Malfunction Events

A malfunction is defined (in part) as any sudden, infrequent, and not reasonably preventable failure of a process (e.g. engine) to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

Knowledgeable personnel who observe a malfunction or abnormal operating condition, including but not limited to abnormal or sustained visible emission observations, have an obligation to notify the appropriate responsible party to curtail engine operation as soon as safely possible. An investigation and corrective repairs should be undertaken and documented to return the malfunctioning equipment to its normal operation and/or before returning the unit to service.

If visible emissions from an engine were observed for two or more continuous hours, a notification of an Excess Emission Event may be required to be submitted to the Michigan Department of Environmental Quality-Air Quality Division within two business days of the event. Contact the Field Leader promptly.

Consult with Environmental Services-Air Quality and/or Legal prior to making an Excess Emission Event Notification compliance determination.

See AQ-023-3 Excess Emission Event Notification/Reporting procedure for details.

5.0 Scheduled Maintenance

The following preventative maintenance actions must be conducted and documented for each engine on the identified schedule:

- Change oil and filter every 500 hours of operation or annually, whichever comes first, or utilize the prescribed oil analysis program at the same frequency (details below) to extend the specified oil changing requirements.
- Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.
- Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary.

Note: Annually is defined as once per calendar year.

Additionally, following completion of the required maintenance activities, it is recommended that a visual emission observation be conducted under routine testing/operating conditions to assure that the engine is operating properly.

Optional Prescribed Oil Analysis Program Requirements:

To extend the specified oil changing requirements, an analysis must be performed at the same frequency specified for changing the oil (i.e. every 500 hours of operation or annually, whichever comes first). If any of the limits are exceeded, the oil must be changed within 2 business days of receiving the results of the analysis or before commencing operation (if the engine is not in operation), whichever is later. Documentation of the analytical results must be maintained.

For Spark Ignition RICE, analyze at a minimum the following three parameters: Total Acid Number, viscosity, and percent water content.

The oil must be changed if any of the following limits are exceeded:

- Total Acid Number increases by more than 3.0 milligrams of potassium hydroxide (KOH) per gram from Total Acid Number of the oil when new;
- Viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; and,
- Percent water content (by volume) is greater than 0.5. [63.625(j)]

NOTE: If an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the work practice requirements on the schedule specified, or if performing the work practice on the required schedule would otherwise pose an unacceptable risk under Federal, State, or local law, the work practice

can be delayed until the emergency is over or the unacceptable risk under Federal, State, or local law has abated. The work practice should be performed as soon as practicable after the emergency has ended or the unacceptable risk under Federal, State, or local law has abated. Sources **must report** any failure to perform the work practice on the schedule required and the Federal, State or local law under which the risk was deemed unacceptable.

6.0 Retention of Records

All compliance records shall be maintained for a period of five (5) years and may be retained in hardcopy or electronic format. Records must be readily accessible and made available to an Agency upon request. At a minimum, the most recent two (2) years of hardcopy records shall be retained on-site, unless the location is unmanned in which case the records shall be maintained at the nearest headquarters with personnel responsible for the equipment.

Compliance records include:

- Documentation that the required maintenance activities were conducted
- Records of deviations for not conducting the required maintenance
- Corrective actions taken during periods of a malfunction to restore a malfunctioning equipment to its normal operation
- If the oil analysis program is utilized, records of the parameters that were analyzed, the results of the analysis, and whether the oil was changed.
- Record the operating hours and reason of use (i.e. emergency, maintenance, readiness testing) for each time an emergency RICE is run. Include a statement describing any emergency operations.