NORTH AMERICAN CENTRAL-LLC

CENTRAL GENERATING FACILITY
PIERSON, MICHIGAN

1 MALFUNCTION ABATEMENT AND PREVENTATIVE MAINTENANCE PLAN

The following section of this Plan contains prevention of malfunctions, detection of malfunctions, and correction of malfunctions for each of the engines.

1.1 Description of the Equipment

North American will operate two internal combustion engines for combusting treated landfill gas to produce electricity. These engines are identified as Emission Units: EUENGINE1, EUENGINE2 in Permit No.45-17.

1.2 Equipment Inspection

Table 1 shows the Engine Plant items or conditions that are inspected, the frequency of the inspections, the procedures followed to aid in the prevention of a malfunction, monitoring parameters that are used to detect and aid in the prevention of a malfunction or equipment failure, the normal range of these parameters, and recording / retaining of the monitoring records.

Table 1
List of Engine Plant Prevention / Detection Items

Item or Conditions to Be Inspected	Frequency of Inspection /Monitoring	Procedures to be Followed to Aid in the Prevention of Malfunctions
Engine Air Cleaner Element	Based on Engine Performance	Replace
Engine Oil	Based on Engine Performance	Change
Engine Oil Level	Weekly	Check engine oil level (Auto fill)
Engine Oil Temperature	Weekly	Check
Oil Filter Differential Pressure	Weekly	Check
Fuel Metering Valve	Based on Engine Performance	Check @ 6,000 hours
Throttle Control Valve	Based on Engine Performance	Check

Item or Conditions to Be Inspected	Frequency of Inspection /Monitoring	Procedures to be Followed to Aid in the Prevention of Malfunctions
Cooling System Coolant Level	Weekly	Coolant level alarm
Cooling System Coolant Temperature	Weekly	Check
Cooling System Coolant Pressure	Weekly	Check
Fumes Disposal Filter Differential Pressure (Crankcase Vent)	Weekly	Check
Generator Load	Weekly	Check
Power Factor	Weekly	Check
Voltage and Frequency	Weekly	Check
Walk-Around Inspection	Weekly	Conduct Walk-Around Inspection
Battery Electrolyte Level	Every 6 months of service	Check battery electrolyte level
Engine Oil Sample	Based on Engine Performance	Obtain engine oil sample
Belts (Radiator)	Every 12 months	Inspect/Adjust/Replace
Engine Crankcase Breather	Based on Engine Performance	Clean as needed
Engine Oil Filter	Based on Engine Performance	Change engine oil filter as needed
Engine Valve Lash and Bridge	Based on Engine Performance	Adjust as needed
Radiator	Based on Engine Performance	Clean/wash as needed
Valve Stem Projection	Based on Engine Performance	Measure/Record-random inspection after baseline
Water Pump	Based on Engine Performance	Inspect
Bearing (Ball)	Based on Engine Performance	Lubricate
Compressor Bypass	Based on Engine Performance	Check
Generator	Based on Engine Performance	Inspect
Ignition System Spark Plugs	Performance based	Inspect/Replace
Crankcase Blow-by	Performance based	Measure/Record
Turbocharger	Every 6,000 hours of service	Inspect
Overhaul	Based on Engine Performance	Top End Overhaul
Overhaul	Between 40,000 and 50,000 hours of service	In-Frame Overhaul
Overhaul	Between 80,000 and 90,000 hours of service	Major Overhaul

Item or Conditions to Be Inspected	Frequency of Inspection /Monitoring	Procedures to be Followed to Aid in the Prevention of Malfunctions
Engine Control Panel		
Control Room Temperature	Weekly	Check
Hours	Weekly	Check
Amps	Weekly	Check
Kilowatts	Weekly	Check
Volts	Weekly	Check
Hertz	Weekly	Check
Power Factor	Weekly	Check
Energy Meter	Weekly	Check
Utility Panel		
Amps	Daily	Daily Readings
Volts	Daily	Daily Readings
Kilowatts	Daily	Daily Readings
Energy Meter	Daily	Daily Readings
Engine Room		
Engine Room Temperature	Weekly	Check
Manifold Air Temperature	Weekly	Check
Engine Exhaust Temperature	Weekly	Check
Manifold Pressure	Weekly	Check
Regulated Gas Pressure	Weekly	Check
Intake Air Temperature	Weekly	Check
Day Tank Level	Weekly	Check
Oil Added	Weekly	Check
Throttle Plate Angle	Weekly	Check

1.3 Replacement Parts

To facilitate quick replacement, the spare or replacement parts necessary for proper engine operation and routine maintenance will be located on site at each generation facility (specialty parts will be ordered as needed). Inventory may vary from time to time.

1.4 Corrective Procedures

The corrective procedures or operational changes shall be taken in the event of a malfunction or failure of the generation facility North American will expeditiously implement the appropriate procedures to correct the event. All of the repair records will be maintained in the operations log.