HORIZON ENVIRONMENTAL

August 21, 2001

Ms. Lillian Woolley
District Supervisor - Air Quality Division
Michigan Department of Environmental Quality
Southeast Michigan District
38980 Seven Mile Road
Livonia, MI 48152-1006

RE: SUPPLEMENT TO PERMIT NO. 320-98A: PLAN TO MINIMIZE EMISSIONS DURING START-UP, SHUTDOWN, AND MALFUNCTION OF THE NATURAL GAS-FIRED COMBUSTION TURBINE GENERATORS AT THE DETROIT EDISON COMPANY'S GREENWOOD ENERGY CENTER

Dear Ms. Woolley:

Pursuant to Special Condition 2.16 of Supplement to Permit No. 320-98A, this letter is intended to act as a plan to describe how emissions will be minimized during startup, shutdown and malfunction of the four combustion turbine generators ("CTGs") at the Detroit Edison Company's ("DEC's") Greenwood Energy Center (the "Facility"). Three of the four permitted CTGs are installed and operated at this time. The enclosed documentation has been prepared by Horizon Environmental Corporation ("Horizon"), an authorized agent of the applicant, Detroit Edison.

MAR 912 requires that a facility operate a source, to the extent reasonably possible, in a manner consistent with good air pollution control practices for minimizing emissions during periods of start-up, shutdown, and malfunction. During these periods, the simple-cycle CTGs at the Facility have variable NO_x and CO emissions that are, intermittently, higher and lower (on a mass per unit time basis) than when operations are at continuous operating loads.

START-UP/SHUTDOWN

Emissions will be minimized during start-up and shutdown periods by performing these operations based on the recommendations of the manufacturer, General Electric ("GE").

Start-up of the GE PG7121(EA) CTGs in use at the Facility consists of a series of steps, each required to reach normal baseload operations. Because the simple cycle CTGs will generally operate as "peaking" units, most start-ups are considered "cold" starts. The following steps make up a normal start-up:

1. Primary Mode – Fuel is delivered to the primary combustion nozzles within the CTG, with flame in the primary zone only. This mode is used to ignite the fuel, accelerate the turbine, synchronize the turbine and generator at a no-load state, and to operate the CTG at low loads. Duration is approximately 15 minutes.
2. Lean-Lean Mode – Fuel is delivered to both the primary and secondary combustion nozzles, with flame in both the primary and secondary zones, for intermediate load conditions. Duration is approximately 5 minutes.
3. Secondary Mode – Fuel is only delivered to the secondary combustion nozzles, with flame in the secondary zone only. This transition mode is necessary to extinguish the flame and purge the primary zone, prior to reintroduction of fuel into what becomes the primary premixing zone. Duration is approximately 2 minutes.
4. Premix Mode – Fuel is delivered to both the primary and secondary combustion nozzles, with flame in the secondary zone only. Approximately 10 minutes is required to reach baseload conditions and for full utilization of the dry, low-NO_x ("DLN") burner system. Premixing of fuel and combustion air in the DLN system results in flame cooling, and therefore lower NO_x emissions. Full load operation in premix mode generally results in lower emissions of all constituents.

Start-up of a simple-cycle CTG at the Facility from "cold start" conditions to normal base load operation therefore requires approximately 30 minutes.

During the shutdown sequence, fuel delivery to the primary and secondary combustion nozzles is gradually decreased to minimize thermal shock to the combustion zone equipment. This cooling stage continues for approximately 20 minutes before fuel delivery is discontinued so that combustion, and therefore associated emissions, is halted.

Based on GE recommendations, start-up and shutdown of the Facility CTGs follow these steps to assure that the CTGs are operated safely, and the potential for damage of the CTGs is minimized during start-up and shutdown. Detroit Edison will strive to minimize emissions during start-up and shutdown by maintaining the CTGs per manufacturer recommendations and by minimizing the period of time the CTGs are not in normal baseload operations.

MAR 912 requires that a facility provide notice to AQD of an abnormal condition, start-up, shutdown, or malfunction that results in an emission of a hazardous air pollutant in excess of an applicable emission standard, and continuing for more than one hour. MAR 912 also mandates notice for a facility's operation that results in emissions of any contaminant continuing for more than 2 hours in excess of an applicable emission standard. The facility shall provide notice and a written report in the event of an abnormal condition, start-up, shutdown, or malfunction that results in either of these circumstances within the time frame identified in MAR 912.

Based on the anticipated duration of normal start-up and shutdown events, Detroit Edison does not anticipate that start-up and shutdown periods will typically necessitate notification of the Air Quality Division ("AQD") pursuant to the requirements of MAR 912, although all required notification will be performed, as necessary.

MALFUNCTION

Emissions will be minimized during malfunctions by performing regular maintenance, testing, and service on the CTGs, based on the recommendations of GE. Proper maintenance of the CTGs will minimize the number of malfunctions during operation.

In addition, Detroit Edison personnel will quickly respond to CTG malfunctions, performing the required repairs to allow the CTG to continue normal operations in a timely fashion, or shutting the CTG down in a safe and efficient manner to allow troubleshooting of the problem while the CTG is off-line. The timely repair or shutdown of the CTGs during malfunctions will also minimize the potential for elevated emissions generated during these periods.

As noted previously, MAR 912 requires that a facility provide notice to AQD of an abnormal condition or malfunction that results in an emission of a hazardous air pollutant in excess of an applicable emission standard, and continuing for more than one hour. MAR 912 also mandates notice for a facility's operation that results in emissions of any contaminant continuing for more than 2 hours in excess of an applicable emission standard. The facility shall provide notice and a written report in either of these circumstances within the time frame identified in MAR 912.

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Should you have any questions concerning the enclosed information, please call me at (616) 554-3210.

Sincerely,

HORIZON ENVIRONMENTAL

Brian P. Greenwald, P.E.
Senior Project Engineer

cc: A. Greenberg, Horizon Environmental
M. Lebeis, Detroit Edison Company