Draft Regulation No. 1148

Control of Stationary Combustion Turbine Electric Generating Unit Emissions

xx/xx/2007

1.0 Purpose. The purpose of this regulation is to control the emissions of nitrogen oxides (NOx) from *stationary combustion turbine electric generating unit*s in the State of Delaware to reduce the impact on public health, safety, and welfare.

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2.0 Applicability.

2.1 This regulation applies to *new* and *existing*, *stationary combustion turbine electric generating unit*s located in Delaware with a *base-load nameplate capacity* of 1 MW or greater.

2.2 This regulation is not applicable to *existing stationary combustion turbine electric generating unit*s that are subject to Regulation No. 12, Control of Nitrogen Oxides Emissions, and meet the NOx emissions limitations identified in Table II of Regulation No. 12, and are not otherwise exempt from the NOx emissions limitations of Table II of Regulation No. 12.

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3.0 Definitions. The following words and terms, when used in this regulation, shall have the following meanings:

"Annual capacity factor" means the ratio of the megawatt-hours produced in a calendar year by a *stationary combustion turbine electric generating unit* to the maximum possible annual electric generation determined on the *base-load nameplate capacity* of the *stationary combustion turbine electric generating unit*.

"Base-load nameplate capacity" means, starting from the initial installation of a *combustion turbine electric generating unit*, the maximum electrical generating output (in MWe) that the *combustion turbine electric generating unit* is capable of producing on a steady basis during continuous operation at rated ambient temperature and atmospheric pressure as specified by the manufacturer of the *combustion turbine electric generating unit* or, starting from the completion of a physical change in the *combustion turbine electric generating unit* resulting in an increase in the maximum electrical generating output (in MWe) that the *combustion turbine electric generating unit* is capable of producing on a steady state basis and during continuous operation, such increased maximum output as specified by the person conducting the physical change.

"Combined cycle" means a *combustion turbine electric generating unit* which recovers heat from the *combustion turbine electric generating unit* exhaust gases

to heat water, to generate steam, or to preheat the inlet combustion air to the *combustion turbine electric generating unit*.

"Combustion turbine" means a combustion engine consisting of a compressor, combustor(s) and power turbine used to provide rotary motion to an output shaft. The combustion turbine may be fueled by gaseous and/or liquid fuels.

"Combustion turbine electric generating unit" means a *combustion turbine* used to drive an *electric generator*.

"Department" means the State of Delaware Department of Natural Resources and Environmental Control as defined in 29 Del. C., Chapter 80, as amended.

"Electric generator" means a device that utilizes rotary motion from an input shaft to create electrical energy.

"Existing" means the unit has been synchronized to the grid before [insert the effective date of this regulation].

"Gaseous fuel" means any non-solid or non-liquid fuel, including natural gas, digester gas, landfill gas, process gas, or any gas stored as a liquid at high pressure such as liquefied petroleum gas.

"Liquid fuel" means any non-solid or non-gaseous fuel, including kerosene, jet fuel, distillate fuel oil, bio-fuels, and methanol.

"New" means the unit was first synchronized to the grid on or after [insert the effective date of this regulation].

"Peak-load nameplate capacity" means, starting from the initial installation of a *combustion turbine electric generating unit*, the maximum electrical generating output (in MWe) that the *combustion turbine electric generating unit* is capable of producing for limited durations at rated ambient temperature and atmospheric pressure as specified by the manufacturer of the *combustion turbine electric generating unit* or, starting from the completion of a physical change in the *combustion turbine electric generating unit* resulting in an increase in the maximum electrical generating output (in MWe) that the *combustion turbine electric generating unit* is capable of producing for limited durations, such increased maximum output as specified by the person conducting the physical change.

"PPMV" means gaseous concentration in parts per million by volume, corrected to 15 percent O_2 dry basis.

"Shutdown" means the period of time between a *combustion turbine generating unit* being brought from an operating condition to fuel shut off. This period of

time may be begun at either opening the generator breaker or disconnecting the *combustion turbine* from the *electric generator*, and is concluded when the fuel is completely shut off to the combustion turbine.

"Simple cycle" means a *combustion turbine electric generating unit* which does not recover heat from the *combustion turbine electric generating unit* exhaust gases to preheat the inlet combustion air to the *combustion turbine electric generating unit*, to heat water, or to generate steam.

"Start-up" means the period during which a combustion turbine generating unit is brought from a *shutdown* status to rated speed and generator breaker closure.

"Stationary" means a unit that is not self-propelled or intended to be propelled while performing its design function.

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4.0 NOx Emissions Limitations.

4.1 Beginning May 1, 2009, no *existing stationary combustion turbine electric generating unit* subject to this regulation shall exceed the NOx emissions limitations shown in Table I of this regulation:

Table I

Fuel Type	NOx Emissions Limit (ppmv)
Gaseous Fuel	**42**
Liquid Fuel	**88**

4.2 The owner or operator of an *existing stationary combustion turbine electric generating unit* shall, no later than May 1, 2009, either demonstrate to the satisfaction of the Department, through source testing approved by the Department, that the existing stationary combustion turbine generating unit meets the NOx emissions limitations of Table I of this regulation or install NOx emission controls designed to meet the NOx emissions limitation of Table I of this regulation in accordance with the requirements of paragraph 4.3 of this regulation.

4.3 The owner or operator of an *existing stationary combustion turbine electric generating unit* installing NOx emissions reduction controls in accordance with the requirements of paragraph 4.2 of this regulation shall install the NOx emissions reduction controls with the goal of achieving the NOx emissions limits of Table I of this regulation, and shall be designed to control NOx emissions across the anticipated operating load range of the *combustion turbine electric generating unit*, including periods of *startup*, *shutdown*, and reduced load operation insofar as technically feasible.

4.3.1 The owner or operator of an *existing stationary combustion turbine electric generating unit* installing NOx emissions reduction controls in accordance with paragraph 4.3 of this regulation, shall submit to the *Department* for approval an emissions control plan detailing all actions, including a schedule of increments of progress, which will be taken to comply with the requirements of paragraph 4.1 of this regulation and the emissions control limitations of Table I of this regulation. The plan shall contain, as a minimum, the following information:

4.3.1.1 Facility and unit identification

4.3.1.2 *Combustion turbine electric generating unit* manufacturer and manufacturer's model number.

4.3.1.3 *Combustion turbine electric generating unit* manufacturer's *base* and *peak* (when applicable) *load nameplate rating*s and rating conditions (atmospheric temperature and pressure, fuel type, etc).

4.3.1.4 Primary and secondary (where applicable) fuel type(s) and typical fuel(s) analysis.

4.3.1.5 Hours of operation and electrical output for the previous five years.

4.3.1.6 Results of any previous NOx emissions testing conducted in the five calendar years prior to [insert the effective date of this regulation].

4.3.1.7 Anticipated future operating schedule (capacity factor), annual and seasonal.

4.3.1.8 Technical description of proposed emissions control technology and equipment designed to minimize NOx emissions across the entire operating range of the existing stationary combustion turbine electric generating unit (insofar as technically feasible), predicted NOx emissions levels following controls installation, and supporting documentation.

4.3.1.9 Compliance schedule including compliance emissions testing conducted representative of anticipated normal load range, including base load and peak load (if applicable), and anticipated monitoring plan submittal.

4.3.1.10 Any other information requested by the *Department*.

4.3.2 The owner or operator of an *existing stationary combustion turbine electric generating unit* submitting an emissions control plan in accordance with paragraph 4.3.1 of this regulation shall submit the plan to the *Department* for approval no later than [insert nine months from the effective date of this regulation].

4.3.3 Following completion of the approved NOx emissions control installation described in paragraphs 4.3.1 and 4.3.2 of this regulation, emissions testing approved by the *Department* shall be conducted to determine compliance with the NOx emissions requirements of paragraph 4.1 and the Table I of this regulation. Testing results shall be submitted to the *Department* no later than 60 days following the completion of the testing.

4.3.4 If actual achievable NOx emissions levels following completion of the approved emissions reduction plan are greater than those of Table I of this regulation, the owner or operator of the *stationary combustion turbine electric generating unit* may petition the *Department* for alternative NOx emissions limitations no greater than the actual achievable NOx emissions levels determined in the post-emissions control installation testing.

4.4 The NOx emissions limitations of paragraph 4.1 and Table I of this regulation, or alternate NOx emissions limitations approved by the *Department* in accordance with paragraph 4.3.4 of this regulation, are applicable to *existing stationary combustion turbine electric generating units* subject to this regulation whenever combusting fuel, except during periods of *start-up* or *shutdown*.

4.5 Compliance with the NOx emissions limitations of paragraph 4.1 and Table I of this regulation, or alternate NOx emissions limitations approved by the *Department* in accordance with paragraph 4.3.4 of this regulation, are based on one hour averaging periods.

4.6 On and after [insert the effective date of this regulation], no *new stationary combustion turbine electric generating unit* subject to this regulation shall exceed the NOx emissions limitations shown in Table II of this regulation.

Table II

	NOx Emissions Limit (ppmv)	
	Gaseous Fuel	***Liquid Fuel***

Simple Cycle* < 25 MW	**25**	**42**
Simple Cycle* ≥ 25 MW	**9**	**25**
Combined Cycle	**3**	**9**

** Base-load nameplate capacity*

4.7 *New stationary combustion turbine electric generating units* shall demonstrate compliance with the NOx emissions limitation of Table II of this regulation in accordance with the performance testing requirements of 40 CFR Part 60, § 60.4400 or, if a NOx diluent monitor has been installed, 40 CFR Part 60, § 60.4405. (71 FR 38497, July 6, 2006)

4.8 *New stationary combustion turbine electric generating unit* compliance with the NOx emissions limitations of paragraph 4.6 and Table II of this regulation are based on 1 hour averages, except during periods of *start-up* or *shutdown*.

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5.0 Monitoring and Reporting.

5.1 For *existing stationary combustion turbine electric generating unit*s with an *annual capacity factor* of 10% or less for each of the five calendar years preceding [insert the effective date of this regulation], compliance emissions testing acceptable to the *Department* shall be conducted by the owner or operator in the calendar year before each calendar year for which the operating permit expires.

5.2 For *existing combustion turbine electric generating unit*s with an *annual capacity factor* greater than 10% for any of the five calendar years preceding [insert the effective date of this regulation], compliance emissions testing acceptable to the *Department* shall be conducted by the owner or operator every two years, starting in the second calendar year after [insert the effective date of this regulation].

5.3 For *existing combustion turbine electric generating unit*s in compliance with paragraph 5.1 of this regulation but which have an *annual capacity factor* of greater than 10% for any year subsequent to [insert the effective date of this regulation], compliance emissions testing acceptable to the *Department* shall be conducted by the owner or operator every two years, starting in the calendar year after the year that the 10% capacity factor was exceeded.

5.4 The owner or operator of an *existing combustion turbine electric generating unit* shall submit to the *Department*, for approval, a monitoring plan containing monitoring information correlating control system parameters or other operating characteristic indications with NOx emissions output.

5.4.1 The correlations may be developed using actual emissions test data and parameters and characteristics recommended by the *combustion turbine electric generating unit* manufacturer, emission control equipment supplier, or other operating experience. The correlations shall address the entire anticipated operating load range of the *combustion turbine electric generating unit*.

5.4.2 This information may be used by the *Department* to monitor compliance with this regulation.

5.4.3 Representative data shall be continuously collected and recorded for any period that the *combustion turbine electric generating unit* combusts any fuel.

5.4.4 The approved monitoring information shall be annually submitted to the *Department* no later than February 1 of the year following the calendar year for which the data is collected, and shall also include detailed explanations for any periods where the monitored operating parameters were outside acceptable margins and include descriptions of corrective actions taken.

5.5 The provisions of paragraphs 5.1, 5.2, 5.3 and 5.4 of this regulation are not applicable to *existing stationary combustion turbine electric generating unit*s which are otherwise required to install, test, operate, and maintain NOx continuous emissions monitoring system in accordance with *Department* or EPA requirements for continuous emissions monitoring systems meeting all applicable requirements of 40 CFR Part 60 or 40 CFR Part 75 (July 1, 2006 edition).

5.6 The owner or operator of an *existing stationary combustion turbine electric generating unit* shall maintain an operating log that includes, on a daily basis, actual start-up and shutdown times, total hours of operation, gross electrical megawatt-hours generated, fuel consumption, type of fuel(s), identification of any periods operating outside the monitoring parameters identified in paragraph 5.4 of this regulation (where applicable), identification of any periods of non-compliance with the requirements of this regulation, cumulative-to-date hours of operation and gross electrical megawatt-hours generated, and any other information requested by the *Department*. This data shall be submitted annually to the *Department* no later than February 1 of the year following the calendar year for which the data is collected.

5.7 The owner or operator of a *new stationary combustion turbine electric generating unit* shall monitor NOx emissions in accordance with the applicable requirements of:

5.7.1 40 CFR Part 60 § 60.4335 for *new stationary combustion turbine electric generating units* utilizing water or steam injection for NOx control. (71 FR 38497, July 6, 2006)

5.7.2 40 CFR Part 60 § 60.4340 for *new stationary combustion turbine electric generating units* not utilizing water or steam injection for NOx control. (71 FR 38497, July 6, 2006)

5.7.3 40 CFR Part 60 § 60.4345 for *new stationary combustion turbine electric generating units* utilizing continuous emissions monitoring system equipment. (71 FR 38497, July 6, 2006)

5.7.4 40 CFR Part 60 § 60.4355 and § 60.4410 for *new stationary combustion turbine electric generating units* utilizing parametric monitoring. (71 FR 38497, July 6, 2006)

5.8 The owner or operator of a *new stationary combustion turbine electric generating unit* shall submit periodic reports in accordance with the applicable requirements of 40 CFR Part 60 § 60.4350, § 60.4375, § 60.4380, and § 60.4395. (71 FR 38497, July 6, 2006)

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6.0 **Recordkeeping.** The owner or operator of a *stationary combustion turbine electric generating unit* subject to this regulation shall maintain, for a period of at least five years, copies of all measurements, tests, reports, operating logs, and other information required by this regulation. This information shall be provided to the *Department* upon request at any time.

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7.0 **Penalties.** The *Department* may enforce all of the provisions of this regulation under 7 Del C., Chapter 60.