

Regulation No. 1146: Electric Generating Unit (EGU) Multi-Pollutant Regulation

1.0 Preamble:

This regulation establishes NO_x, SO₂, and mercury *emissions* limits to achieve reductions of those pollutants from Delaware's large electric generation units. The reduction in NO_x, SO₂, and mercury emissions will: 1) reduce the impact of those *emissions* on public health; 2) aid in Delaware's attainment of the State and National Ambient Air Quality Standard (NAAQS) for ground level ozone and fine particulate matter; 3) address local scale fine particulate and mercury problems attributable to coal and *residual oil*-fired electric generating units, 4) satisfy Delaware's obligations under the Clean Air Mercury Rule (CAMR), and 5) improve visibility and help satisfy Delaware's EGU-related regional haze obligations.

While the purpose of this regulation is to reduce air emissions, any emission control equipment installed to meet the requirements of this regulation may impact other media (e.g., water), and any overall environmental impacts must be considered by subject entities when they design their overall compliance strategy. Any emission controls installed to meet the requirements of this regulation will be subject to public review and comment through air Reg. 2 and 30 permitting requirements.

Separate from this Regulation the Department will propose regulations to address CO₂ emissions from these units, and regulations to satisfy direct fine particulate matter Reasonably Available Control Technology (RACT) and Best Available Retrofit Technology (BART) requirements. Together, these regulations will cover current and foreseeable requirements relative to the subject units.

2.0 Applicability: This regulation applies to *coal-fired* and *residual oil*-fired electric generating units located in Delaware with a *nameplate capacity* rating of 25 MW or greater that commenced operation on or before the effective date of this regulation.

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

“*Administrator*” means the Administrator of the United States Environmental Protection Agency or the Administrator's duly authorized representative.

“*Coal*” means any solid fuel classified as anthracite, bituminous, sub-bituminous, or lignite.

“*Coal-fired*” means combusting any amount of coal or coal-derived fuel, alone or in combination with any amount of other fuel, during any year.

“*Department*” means the State of Delaware Department of Natural Resources and Environmental Control as defined in Title 29, Delaware Code, Chapter 80, as amended.

“*Designated representative*” means the natural person who is authorized by the *owners* and *operators* of the source and all units at the source to legally bind each *owner* and *operator* in matters pertaining to this regulation. If the source subject to this regulation is also subject to the Acid Rain Program, then this natural person shall be the same person as the designated representative under the Acid Rain Program.

“*Emissions*” means air pollutants exhausted from a unit or source into the atmosphere.

“*Generator*” means a device that produces electricity.

“*Heat input*” means the product (in MMBTU/time or TBTU/time) of the gross calorific value of the fuel (in MMBTU/lb or TBTU/lb) and the fuel feed rate (in lb of fuel/time) into a combustion device; or as calculated by any other method approved by the Department and the Administrator, and does not include the heat derived from pre-heated combustion air, recirculated flue gasses, or exhaust from other sources.

“*Inlet mercury*” means the average concentration of mercury in the flue gas at the inlet to any pollution control device(s)

“*Nameplate capacity*” means, starting from the initial installation of a generator, the maximum electrical generating output (in MWe) that the generator is capable of producing on a steady state basis and during continuous operation (when not restricted by seasonal or other de-ratings) as specified by the manufacturer of the generator or, starting from the completion of any physical change in the generator resulting in an increase in the maximum electrical generating output (in MWe) that the generator is capable of producing on a steady state basis and during continuous operation (when not restricted by seasonal or other de-ratings), such increased maximum amount as specified by the person conducting the physical change.

“*Operator*” means any person who operates, controls, or supervises a unit or source subject to this regulation and shall include, but not be limited to, any holding company, utility system, or plant manager of such unit or source.

“*Ounce*” means 28.4 grams.

“*Owner*” means: A) any holder of any portion of the legal or equitable title in a unit; B) any purchaser of power from a unit under a life-of-the-unit, firm power contractual arrangement; provided that, unless expressly provided for in a leasehold agreement, *owner* shall not include a passive lessor, or a person who has an equitable interest through such lessor, whose rental payments are not based (either directly or indirectly) on the revenues or income from the unit.

“*Residual oil*” means No. 5 or No. 6 fuel oil.

“*Ton*” means 2000 pounds.

“*Unit*” means, for the purposes of this regulation, a stationary, fossil-fuel-fired boiler supplying all or part of its output to an electric generating device.

“*Zero-emitting electric generating unit*” means an electric generator with annual generation greater than 2000 MWh that began commercial operation after January 1, 2006, and is powered by wind, solar, ocean thermal, wave, geothermal, or hydroelectric energy.

4.0 NO_x Emissions Limitations

4.1 From January 1, 2009 through December 31, 2011, no *unit* subject to this regulation shall emit NO_x at a rate exceeding 0.15 lb/MMBTU.

4.1.1 Compliance with the requirements of paragraph 4.1 of this section shall be demonstrated on a rolling 24-hour average basis.

4.1.2 NO_x *emissions* from multiple *units* subject to this regulation at a common facility may be averaged on a *heat input* basis to demonstrate compliance with the requirements of paragraph 4.1 of this regulation.

4.2 On and after January 1, 2009, no *unit* subject to this regulation shall emit annual NO_x mass emissions that exceed the values shown in Table I.

4.2.1 From January 1, 2009 through December 31, 2011, compliance with the requirements of paragraph 4.2 of this regulation may be achieved by demonstrating that the total number of tons of NO_x emitted from a common facility does not exceed the sum of the tonnage limitations for all of the units subject to this regulation at that facility.

4.2.2 Compliance with the requirements of paragraph 4.2 of this regulation shall not be achieved by using, tendering, or otherwise

acquiring NO_x allowances under any state or federal emission trading program.

- 4.2.3 For the purpose of determining compliance with the requirements of paragraph 4.2. of this regulation, the total tons for a specified period shall be calculated as the sum of all recorded hourly emissions, with any remaining fraction of a ton equal to or greater than 0.50 ton deemed to equal one ton and any remaining fraction of a ton less than 0.50 ton deemed equal to zero tons.
- 4.3 On and after January 1, 2012, no *unit* subject to this regulation shall emit NO_x at a rate exceeding 0.125 lb/MMBTU, demonstrated on a rolling 24-hour average basis.
- 4.4 Compliance with the requirements of paragraphs 4.1 through 4.3 of this section shall be demonstrated with a continuous emissions monitoring system that is installed, calibrated, operated, and certified in accordance with 40 CFR Part 75 (May 18, 2005 amendment) or other method approved by the Department and the Administrator, and meeting the requirements of 40 CFR Part 96, subpart HH (April 28, 2006 amendment).

5.0 SO₂ Emissions Limitations

- 5.1 From January 1, 2009 through December 31, 2011, no coal fired *unit* subject to this regulation shall emit SO₂ at a rate exceeding 0.37 lb/MMBTU *heat input*.
 - 5.1.1 Compliance with the requirements of paragraph 5.1 of this section shall be demonstrated on a 24-hour rolling average basis.
 - 5.1.2 SO₂ *emissions* from multiple *units* subject to this regulation at a common facility may be averaged on a *heat input* basis to demonstrate compliance with the requirements of paragraph 5.1 of this regulation.
- 5.2 On and after January 1, 2012, no coal-fired unit subject to this regulation shall emit SO₂ at a rate exceeding 0.26 lb/MMBTU *heat input*, demonstrated on a rolling 24-hour average basis.
- 5.3 On and after January 1, 2009, no unit subject to this regulation shall emit annual SO₂ mass *emissions* that exceed the values shown in Table II.
 - 5.3.1 From January 1, 2009 through December 31, 2011, compliance with the requirements of paragraph 5.3 of this regulation may be achieved by demonstrating that the total number of tons of SO₂

emitted from a common facility does not exceed the sum of the tonnage limitations for all of the units subject to this regulation at that facility.

- 5.3.2 Compliance with the requirements of paragraph 5.3 of this regulation shall not be achieved by using, tendering, or otherwise acquiring SO₂ allowances under any state or federal emission trading program.
- 5.3.3 For the purpose of determining compliance with the requirements of paragraph 5.3 of this regulation, the total tons for a specified period shall be calculated as the sum of all recorded hourly emissions, with any remaining fraction of a ton equal to or greater than 0.50 ton deemed to equal one ton and any remaining fraction of a ton less than 0.50 ton deemed equal to zero tons.
- 5.4 Compliance with the requirements of paragraphs 5.1 through 5.3 of this regulation shall be demonstrated with a continuous *emissions* monitoring system that is installed, calibrated, operated and certified in accordance with 40 CFR Part 75 (May 18, 2005 amendment) or other method approved by the Department and the Administrator, and meeting the monitoring and reporting requirements of 40 CFR Part 96, subpart HHH (April 28, 2006 amendment).
- 5.5 On and after January 1, 2009, no *residual oil-fired unit* subject to this regulation shall combust any fuel with a sulfur content in excess of 0.5%, by weight.
 - 5.5.1 Compliance with the requirements of paragraph 5.5 shall be demonstrated by fuel oil sampling and analysis each day the *unit* fires any quantity of oil fuel.
 - 5.5.2 Fuel oil samples shall be collected from the supply pipeline at the inlet to the unit after sufficient fuel oil has been drained from the sampling line to remove any fuel oil that may have been standing in the sampling line.
 - 5.5.3 Fuel oil samples shall be analyzed in accordance with ASTM D 129-00, ASTM D 1552-03, ASTM D 2622-05, or ASTM D 4294-03.

6.0 Mercury Emissions Limitations

- 6.1 From January 1, 2009 through December 31, 2012, any *coal-fired unit* subject to this regulation shall, on a quarterly average basis:

- 6.1.1 Emit mercury at a rate that does not exceed 1.0 lb/TBTU *heat input*, or
 - 6.1.2 Capture and control a minimum 80% of baseline inlet mercury emissions.
- 6.2 On or after January 1, 2013, any *coal-fired unit* subject to this regulation shall, on a quarterly average basis:
- 6.2.1 Emit mercury at a rate that does not exceed 0.6 lb/TBTU *heat input*, or
 - 6.2.2 Capture and control a minimum 90% of baseline inlet mercury emissions.
- 6.3 Annual mercury mass *emissions* from the *coal-fired units* subject to this regulation shall not exceed the values shown in Table III.
- 6.3.1 Compliance with the requirements of paragraph 6.3 of this regulation shall be demonstrated on an annual basis.
 - 6.3.2 Compliance with the requirements of paragraph 6.3 of this regulation shall not be achieved by using, tendering, or otherwise acquiring mercury allowances under any state or federal *emissions* trading program.
- 6.4 Compliance with the requirements of paragraphs 6.1 through 6.3 of this regulation shall be demonstrated as follows:
- 6.4.1 Compliance with the requirements of paragraphs 6.1.1., 6.2.1, and 6.3. shall be demonstrated with a continuous *emissions* monitoring system that is installed, calibrated, operated, and certified in accordance with 40 CFR Part 75 (May 18, 2005 amendment) and meeting the monitoring and reporting requirements of 40 CFR Part 60 (June 9, 2006 amendment).
 - 6.4.2 Compliance with the requirements of paragraphs 6.1.2. and 6.2.2. shall be demonstrated as follows:
 - 6.4.2.1 During the period January 1, 2007 through March 31, 2008, the *owner* or *operator* shall conduct at least four quarterly stack tests to measure the mercury in the flue gas stream.

6.4.2.1.1 Except as provided for in 6.4.2.1.2, the test sampling location shall be located upstream of any pollution control device.

6.4.2.1.2 The sampling location may be located downstream of any SNCR injection points.

6.4.2.2 There shall be at least three valid stack tests per quarter and at least 45 days between stack tests performed for a given quarter and the stack tests performed for the preceding quarter, unless otherwise approved by the *Department*.

6.4.2.3 Each stack test shall be conducted in accordance with a testing protocol approved by the *Department*. Proposed test protocols shall be submitted to the *Department* no less than 90 days prior to conducting the mercury tests.

6.4.2.4 The baseline inlet mercury emission rate for the affected *unit*, in lb/TBTU, shall be determined as the arithmetic average of the quarterly stack tests conducted on that *unit* in accordance with section 6.4.2.1 of this regulation.

6.4.2.5 No later than June 1, 2008, the *owner or operator* shall submit a petition to the *Department* requesting the establishment of a unit specific mercury emission rate limit. As a minimum, the report shall contain the following information:

6.4.2.5.1 Identification and brief description of the affected *unit*.

6.4.2.5.2 A list and brief description of all emissions control equipment installed on the affected *unit* at the time of the stack tests, including operating status at the time of the stack tests.

6.4.2.5.3 An accounting of all fuels and fuel quality being fired during the emissions tests.

6.4.2.5.4 Results of each quarterly mercury emissions tests.

6.4.2.5.5 Proposed mercury emission limits that are no greater than 20% of the baseline uncontrolled mercury emission rate determined in accordance with section 6.4.2. of this regulation for the annual periods January 1, 2009 through December 31, 2012, and no

greater than 10% of the baseline uncontrolled mercury emission rate determined in accordance with section 6.4.2 of this regulation for the annual periods starting January.1, 2013 and beyond.

6.4.2.5.6 Summary description of the actions anticipated by the *owner or operator* of the affected *unit* to attain compliance with the proposed mercury emission limits.

6.4.2.6 The *owner or operator* of the affected *unit* shall submit to the *Department* any additional information requested by the *Department* necessary for review and approval of the petition.

6.4.2.7 If approved, the *Department* shall establish, for the affected *unit*, a unit specific mercury emission rate no greater than 20% of the *unit's* baseline uncontrolled mercury emissions rate for the period January 1, 2009 through December 31, 2012, and no greater than 10% of the *unit's* baseline uncontrolled mercury emission rate for the period January 2013 and beyond.

7.0 Zero-Emitting Electric Generator Credit

- 7.1 The *zero-emitting electric generator* must be located in Delaware, or the cables transporting the output from the *zero-emitting electric generator* must make first landfall in Delaware.
- 7.2 The *owner or operator* of a *unit* subject to this regulation, and who is also an *owner or operator* of a *zero-emitting electric generator*, may take credit for an offset in *heat input*, at the *unit* subject to this regulation, determined from the actual generation of the zero-emitting electric generator.
 - 7.2.1 The offset in heat input (in MMBTU or TBTU) from the electric generation from any *zero-emitting electric generator* shall be calculated as the product of the electrical generation occurring in the respective time period (in MWh) and the factor 3.413 MMBTU/MWh, which quantity is then divided by an energy conversion factor of 0.33.
 - 7.2.2 The offset in heat input may then be added to the heat input due to fuel firing in the *unit* subject to this regulation, for the respective time period, which is then used to calculate the *unit's* emission rate

(in lb/MMBTU or lb/TBTU) corrected for *zero-emission electric generator* output.

- 7.2.3 The *unit's* offset in mass emission (in tons) for any respective time period shall be the product of the offset heat input calculated in paragraph 7.2.1 of this regulation and the respective emission rate (in lb/MMBTU or lb/TBTU) before correction for the *zero-emitting electric generator* output, with that quantity divided by 2000. Any *unit's* offset in mass emissions can not exceed the actual emissions occurring in the respective time period.
- 7.3 There is no limitation on the number of *zero-emitting electric generators* whose output may be used in the determination of any given *unit's* corrected emission rate or mass emissions, except any *unit's* offset in mass emissions can not exceed the actual emissions occurring in the respective time period.
- 7.4 The output from any *zero-emitting electric generator(s)* may be split between any of the *units* in Delaware subject to this regulation who share the *zero-emitting electric generator(s)' owner or operator* for the respective time period.

8.0 Recordkeeping and Reporting

- 8.1 The owner or operator of a *unit* subject to this regulation shall comply with all applicable recordkeeping and reporting requirements of 40 CFR Part 75 (May 18, 2005) and this regulation.
- 8.2 The owner or operator of a *unit* subject to this regulation shall maintain, for a period of at least five years, copies of all measurements, tests, reports, and other information required by 40 CFR Part 75 (May 18, 2005 amendment) and this regulation. This information shall be provided to the *Department* upon request at any time.
- 8.3 After January 1, 2009, the owner or operator of a *unit* subject to this regulation shall submit to the *Department* quarterly reports no later than 30 days following each calendar quarter. The quarterly report shall contain, as a minimum, the following information:
- 8.3.1 Tabulation of emission monitoring results reduced to 1-hour averages, on a clock basis, for the quarter in units consistent with the applicable emission standard.
- 8.3.2 In addition to the requirements of Section 8.3.1, the following calculations shall be made and reported in the quarterly report:

- 8.3.2.1 For mass emission standards based on daily limits, the daily mass emission on a calendar day basis for each day in the quarter, in units consistent with the applicable emission standard.
- 8.3.2.2 For mass emissions based on quarterly limits, the quarterly mass emission on a calendar quarter basis for the quarter, in units consistent with the applicable emission standard.
- 8.3.2.3 For mass emissions based on an annual limit, the calendar year-to-date summation of mass emissions through the quarter being reported, in units consistent with the applicable emission standard.
- 8.3.2.4 For emission rate averaging, identification of the units being averaged, hourly heat input of the respective units, hourly emission rate of the respective units, and the hourly combined heat input weighted emission average for the affected units.
- 8.3.3 Identification of any period(s) of, and cause for, any invalid data averages.
- 8.3.4 Records of any repairs, adjustment, or maintenance to the monitoring system.
- 8.3.5 The results of all fuel oil sulfur analysis.
- 8.3.6 Identification of any exceedance of any emission standard provided by this regulation, cause of the exceedance, and corrective action taken in response to the exceedance.
- 8.3.7 Results from all tests, audits, and recalibrations performed during the quarter.
- 8.3.8 Any other relevant data requested by the *Department*.
- 8.3.9 A statement, "I am authorized to make this submission on behalf of the owners and operators of the affected facility or affected units for which this submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge

true, accurate and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.”

8.3.10 Signature by the *designated representative*.

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

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Table I
Annual NO_x Mass Emissions Limits

<u>Unit</u>	<u>Control Period NO_x</u> <u>Mass Emissions Limit</u> <u>(tons)</u>
Edge Moor 3	773
Edge Moor 4	1339
Edge Moor 5	1348
Indian River 1	601
Indian River 2	628
Indian River 3	977
Indian River 4	2032
McKee Run 3	244

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Table II
Annual SO₂ Mass Emissions Limits

<u>Unit</u>	<u>Control Period SO₂</u> <u>Mass Emissions Limit</u> <u>(tons)</u>
Edge Moor 3	1391
Edge Moor 4	2410
Edge Moor 5	2427
Indian River 1	1082
Indian River 2	1130
Indian River 3	1759
Indian River 4	3657
McKee Run 3	439

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Table III
Annual Mercury Mass Emissions Limits

<u>Unit</u>	Mercury Mass Emissions 2009 – 2012 <u>(ounces)</u>	Mercury Mass Emissions 2013 and Beyond <u>(ounces)</u>
Edge Moor Unit 3	266	99
Edge Moor Unit 4	462	172
Indian River Unit 1	207	77
Indian River Unit 2	216	81
Indian River Unit 3	337	125
Indian River Unit 4	700	261