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## Model Rule for Stationary Generator Control Measures

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*(Items highlighted in yellow are references to dates or other sections, which are subject to change.)*

**Section 01 Definitions** Note: The definitions used in this section are provided as examples for state adoption as needed. The following words, terms, and abbreviations used in this regulation shall have the following meanings:

- (a) “Combined heat and power” and “CHP” means a generator that sequentially produces both electric power and thermal energy from a single source, where the thermal energy is wholly or partly used for either industrial processes or other heating or cooling purposes.
- (b) “Demand response” means when end-use customers reduce their use of electricity in response to power grid needs, economic signals from a competitive wholesale market, or special retail rates.
- (c) “Diesel fuel” means any fuel sold in any state or Territory of the United States and suitable for use in diesel motor vehicles, diesel motor vehicle engines, diesel nonroad engines, or diesel stationary engines, and which is commonly or commercially known or sold as diesel fuel.
- (d) “Digester gas” means gas generated by the anaerobic digestion of organic wastes, which include, but are not limited to, livestock manure, industrial wastewater, or food processing waste.
- (e) “Electric generating unit” means a unit that generates electricity that is sold by the owner or operator of the unit. This term includes, but is not limited to, stationary combustion turbines or stationary internal combustion engines used to generate electricity.
- (f) “Electric public utility” means a public utility that transmits and distributes electricity to end users within a State and which is regulated by a Public Utilities Commission.
- (g) “Emergency” means:
  - (1) an electric power outage due to: a failure of the electrical grid; on-site disaster;

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local equipment failure; or public service emergencies such as flood, fire, natural disaster, or severe weather conditions (e.g., hurricane, tornado, blizzard, etc.); or

(2) when there is a deviation of voltage or frequency from the electric public utility to the premises of three percent (3%) or greater above, or five percent (5%) or greater below, standard voltage or frequency; or

*(3) [This section reserved for state specific language pertaining to a generator operating for emergency purposes in conjunction with a state's respective Independent System Operator.]*

(h) "Emergency generator" means any generator powered by a stationary internal combustion engine whose operation is limited to emergency situations and required testing and maintenance. This term shall not include any of the following:

(1) generators used to supply power to an electric grid or that supply power as part of a financial arrangement with another entity, such as an electric public utility or an independent system operator;

(2) equipment that serves as an energy or power source in circumstances other than emergencies, such as a load shaving unit or a generator participating in demand response;

(3) equipment which continues to be used after the primary energy or power source has either become operable again or should have become operable had the owner or operator made a reasonable effort to repair it;

(4) a peaking electric generating unit;

(5) naval marine internal combustion engines operated by the United States Navy for the purpose of testing and operational training; or

(6) a stationary internal combustion engine used at a nuclear power plant as an emergency generator which is subject to the regulations of the Nuclear Regulatory Commission (NRC).

(i) "Existing" means a generator which is installed before **XXXX (effective date)**.

(j) "Generator" means an internal combustion engine, except for a combustion turbine, and associated equipment that converts primary fuel (including fossil fuels and renewable fuels) into electricity, or electricity and thermal energy.

(k) "Internal combustion engine" means either a reciprocating engine or combustion turbine in which power, produced by heat and/or pressure that is developed in the engine combustion chambers by the burning of a mixture of air and fuel, is subsequently converted to mechanical work.

(l) "Landfill gas" means gas generated by the decomposition of organic waste deposited in a landfill (including municipal solid waste landfills) or derived from the evolution of

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organic compounds in the waste.

- (m) "lb/MWh" means the pounds of emissions emitted per the megawatts of electricity produced per hour.
- (n) "Load response" means the same as demand response.
- (o) "Load shaving unit" means an electric generating unit which generates electricity for sale or use during periods of higher than normal demand for electricity.
- (p) "Maximum allowable emission rate" means the maximum amount of an air contaminant that may be emitted into the ambient air during one of the following:
  - (1) A prescribed interval of time, such as one hour or one day;
  - (2) The period of time required for a unit activity, such as the burning of one gallon of fuel; or
  - (3) The period of time required to produce a given unit of output, such as the generation of one megawatt of electricity.
- (q) "Maintenance" means the work necessary to repair, prevent damage, or sustain existing components of a generator or any ancillary equipment associated with its use.
- (r) "New" means a generator which is installed or repowered on or after XXXX (effective date).
- (s) "Non-emergency generator" means a stationary generator that may be used during an emergency, during testing, and for maintenance purposes, as well as for any other purpose at times other than during an emergency. This term includes, but is not limited to, electric generating units, load shaving units, peaking electric generating units, and generators participating in demand response.
- (t) "Owner" means the owner, operator, or person responsible for a generator.
- (u) "Peaking electric generating unit" means a load shaving unit.
- (v) "Power outage" means an interruption in the provision of electricity to customers because normally available sources of electrical energy are unavailable due to circumstances beyond the control of both the customer and the power supplier.
- (w) "Power to heat ratio" means for a CHP unit, the design electrical output divided by the design recovered thermal output in consistent units.
- (x) "Prime power rating" means the maximum amount of power a generator is capable of supplying during continuous duty, as specified by the manufacturer.
- (y) "Reciprocating engine" means an internal combustion engine with a crankshaft.

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- (z) “Repower” means the replacement of the internal combustion engine of a generator with another internal combustion engine.
- (aa) “Standby power rating” means the amount of power a generator is capable of supplying during a power outage for the duration of the interruption, as specified by the manufacturer.
- (bb) “Stationary” means a generator powered by an internal combustion engine which is not propelled or intended to be propelled while performing its function, that is used either in a fixed application, or in a portable (or transportable) application in which the engine will stay at a single location on a property (which includes the land, the buildings, and all improvements thereon) for more than 30 consecutive days (i.e., a generator which is not mobile).
- (cc) “Testing” means determining the capability of a generator to meet the specified requirements of this regulation or determining if the generator and any ancillary equipment associated with its use are functioning correctly.
- (dd) “Waste gas” means manufacturing or mining byproduct gases that are not used and are otherwise flared or incinerated. A manufacturing or mining byproduct is a material that is not one of the primary products of a particular manufacturing or mining operation, is a secondary and incidental product of the particular operation, and would not be solely and separately manufactured or mined by the particular manufacturing or mining operation. The term does not include an intermediate manufacturing or mining product which results from one of the steps in a manufacturing or mining process and is typically processed through the next step of the process within a short time.

## Section 02 Applicability

- (a) This regulation applies on or after XXXX (effective date) to any stationary generator that has a maximum standby power rating which equals or exceeds X kW (*this rating could be any level between 10-100kW, depending on State needs*), except that this category shall not include stationary internal combustion engines used at a nuclear power plant as an emergency generator which are subject to regulations of the Nuclear Regulatory Commission (NRC), nor naval marine internal combustion engines operated by the United States Navy for the purpose of testing and operational training.
- (b) Use of the term “generator” in this regulation shall refer to any and all generators subject to the requirements of this regulation unless the type of generator being referred to is otherwise specified.
- (c) Any stationary generator which is moved from one property to another in a deliberate attempt to circumvent the residence time requirement of 30 consecutive days shall be deemed stationary.
- (d) Each shipment of diesel fuel received for use in a generator on or after XXXX (effective date) shall have a sulfur content equal to or less than 0.0015% (15 ppm) by weight.

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- (e) The requirements of **Section 04** shall apply to a non-emergency generator if the generator is operated at any time other than during emergencies, for testing, or for maintenance purposes.
- (f) The requirements of **Section 05** shall apply to an emergency generator if:
  - (1) The generator is only operated during emergencies due to circumstances beyond the control of the owner or operator of the facility, or for testing or maintenance of the generator to ensure operability; and
  - (2) The owner or operator complies with the provisions of **Section 05** Emission Standards and Control Options for Emergency Generators.

### **Section 03 Registration of Stationary Generators**

- (a) The owner of a stationary generator shall submit to the State the following information, prior to the installation of any new generator, or prior to **XXXX (3 months after effective date)** for any existing generator:
  - (1) the generator owner's name and telephone number;
  - (2) the physical address where the generator is installed, or will be installed;
  - (3) the geographical coordinates (latitude and longitude) where the generator is installed, or will be installed;
  - (4) a description of the generator including the make, model number, and serial number;
  - (5) the year of manufacture for the generator;
  - (6) the standby power rating or the prime power rating for the generator, or both power ratings if both are known; and
  - (7) the date of installation for existing generators, or the expected date of installation for new generators.
- (b) The owner of a stationary generator shall submit to the State a letter stating whether the generator is to be classified as an emergency generator or a non-emergency generator.

### **Section 04 Emission Standards for Non-Emergency Generators**

- (a) The owner or operator of a non-emergency generator which meets the applicability criteria of **Section 02(d)** above shall ensure that the generator complies with the provisions of this section, unless the generator is operating as an emergency generator.

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(b) A generator shall not exceed the following emissions standards under full load design conditions or at the load conditions specified by the applicable testing methods. If add-on controls are applied to the generator, emission controls shall be operating at full effectiveness as soon as possible, but not later than 10 minutes following engine startup or the amount of time recommended by the engine manufacturer.

(1) For an existing, non-emergency generator:

- i. 4.0 lb/MWh (1.8 g/kWh) nitrogen oxides;
- ii. 1.9 lb/MWh (0.86 g/kWh) nonmethane hydrocarbons;
- iii. 0.7 lb/MWh (0.32 g/kWh) particulate matter (for liquid-fueled generators only); and
- iv. 10.0 lb/MWh (4.5 g/kWh) *(or 0.87lb/MWh ~ 0.4g/kWh – new ZZZZ req't?)* carbon monoxide.

(2) For a new, non-emergency generator, installed after XXXX (effective date):

- i. 0.88 lb/MWh (0.4 g/kWh) nitrogen oxides;
- ii. 0.41 lb/MWh (0.19 g/kWh) nonmethane hydrocarbons;
- iii. 0.044 lb/MWh (0.02 g/kWh) particulate matter (for liquid-fueled generators only); and
- iv. 7.7 lb/MWh (3.5 g/kWh) *(or 0.87lb/MWh ~ 0.4g/kWh – new ZZZZ req't?)* carbon monoxide.

(3) For a new, non-emergency generator that uses waste, landfill, or digester gases, installed after XXXX (effective date):

- i. 2.2 lb/MWh (1.0 g/kWh) nitrogen oxides;
- ii. 0.7 lb/MWh (0.32 g/kWh) nonmethane hydrocarbons;
- iii. 10.0 lb/MWh (4.5 g/kWh) carbon monoxide.

(c) The compliance dates for the emissions standards of Section 04(b) shall be:

- a. XXXX (1 year after effective date) for each existing, non-emergency generator; and
- b. prior to initial operation for a new, non-emergency generator.

(d) Compliance with the emission standards specified in this section shall be determined by the emissions data obtained from the test methods specified in Section XXXX. *(State specific section)*

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- (e) To ensure continuing compliance with the emissions limitations, the owner or operator shall verify a non-emergency generator's compliance with the emission standards specified in this section every five years.
- (f) The recordkeeping and reporting requirements for generators shall be in accordance with the provisions of **Section 07, Section XXXX and Section XXXX**, respectively (*These sections refer to individual State recordkeeping, reporting, and emission statement requirements*).

## **Section 05 Emission Standards and Control Options for Emergency Generators**

- (a) The owner or operator of an emergency generator which meets the applicability criteria of **Section 02(e)** shall ensure that the emergency generator complies with the provisions of this section.
- (b) The emergency generator is operated only during emergencies due to circumstances beyond the control of the owner or operator of the facility, or for testing the engine to ensure operability.
- (c) The owner or operator of an emergency generator shall not test the emergency generator on days when air quality is predicted by the State or designated Agency to be at least "unhealthy for sensitive groups" as defined in the U.S. EPA's Air Quality Index.
- (d) The owner or operator of an emergency generator shall:
  - (1) at all times, operate the generator in conformance with the generator manufacturer's instructions, such as following maintenance and operating requirements to help minimize emissions, if the generator is considered to be an existing, emergency generator;
  - (2) ensure the generator meets the applicable maximum allowable emission rates in 40 CFR 60, Subpart IIII or Subpart JJJJ (July 1, 2010 ed.), for the stationary engine powering the emergency generator, prior to its initial operation, if the generator is considered to be a new, emergency generator according to this regulation;
  - (3) notify the State of **XXXX** in writing in the event that a generator fails to comply with the requirements of **Section 05 (b) or (c)**.
- (e) An existing generator shall not be considered a new generator, as defined by this regulation, if it is relocated and reinstalled on the same property, nor if it is reclassified from an emergency generator to a non-emergency generator or vice versa.
- (f) The recordkeeping and reporting requirements for emergency generators shall be in accordance with the provisions of **Section 07, Section XXXX and Section XXXX**, respectively (*These sections refer to individual State recordkeeping, reporting, and emission statement requirements*).

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**Section 06 Credit for Concurrent Emissions Reductions (OPTIONAL – Up to each state to decide to include)**

- (a) Flared Fuels. If a generator combusts fuel that would otherwise be flared (i.e., not used for generation or other energy related purpose), the emissions that were or would have been produced through the flaring can be deducted from the actual emissions of the generator, for the purposes of calculating compliance with the requirements of this regulation. If the actual emissions from flaring can be documented, they may be used as the basis for calculating the credit, subject to the approval of the State. If the actual emissions from flaring cannot be documented, then the following default values shall be used:

Emissions	Waste, Landfill, Digester Gases
Nitrogen Oxides	0.1 lbs/MMBtu
Particulate Matter	N/A
Carbon Monoxide	0.7 lb/MMBtu

- (b) Combined Heat and Power.

- (1) CHP installations shall meet the following requirements to be eligible for emissions credits related to thermal output:

- i. At least 20% of the fuel's total recovered energy shall be thermal and at least 13% shall be electric. This corresponds to an allowed power-to-heat ratio range of between 4.0 and 0.15.
- ii. The design system efficiency shall be at least 55%.

- (2) A CHP system that meets the requirements of **Section 06(b)(1)** of this regulation may receive a compliance credit against its actual emissions based on the emissions that would have been created by a conventional separate system used to generate the same thermal output. The credit shall be subtracted from the actual generator emissions for purposes of calculating compliance with the limits in **Section 04 or Section 05** of this regulation. The credit will be calculated according to the following assumptions and procedures:

- i. The emission rates for CHP facilities that replace existing thermal systems (e.g., boiler) for which historic emission rates can be documented shall be the historic emission rates in lbs/MMBtu, but not more than the emission rates for new facilities that displace a thermal system, which are:

Emissions	Maximum Rate
Nitrogen Oxides	0.2 lbs/MMBtu
Particulate Matter	N/A
Carbon Monoxide	0.08 lbs/MMBtu



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- ii. The emissions rate of the thermal system in lbs/MMBtu will be converted to an output-based rate by dividing by the thermal system efficiency. For new systems the efficiency of the avoided thermal system will be assumed to be 80% for boilers or the design efficiency of other process heat systems. If the design efficiency of the other process heat system cannot be documented, an efficiency of 80% will be assumed. For retrofit systems, the historic efficiency of the displaced thermal system can be used if that efficiency can be documented and if the displaced thermal system is either enforceably shut down and replaced by the CHP system, or if its operation is measurably and enforceably reduced by the operation of the CHP system.
- iii. The emissions per MMBtu of thermal energy output will be converted to emissions per MWh of thermal energy by multiplying by 3.413 MMBtu/MWh<sub>thermal</sub>.
- iv. The emissions credits in lbs/MWh<sub>thermal</sub>, as calculated in Section 06(b)(2)(iii) of this regulation, will be converted to emissions in lbs/MWh<sub>emissions</sub> by dividing by the CHP system power-to-heat ratio.
- v. The credit, as calculated in Section 06(b)(2)(iv) of this regulation, will be subtracted from the actual emission rate of the CHP unit to produce the emission rate used for compliance purposes.
- vi. The mathematical calculations set out in Section 06(b)(2)(i) through Section 06(b)(2)(iv) of this regulation are expressed in the following formula:

$$\text{Credit lbs/MWh}_{\text{emissions}} = \frac{(\text{boiler limit lbs/MMBtu})}{(\text{boiler efficiency})} \times \frac{3.413}{(\text{power to heat ratio})}$$

- (c) Non-Emitting Resources. When electricity generation that does not produce any of the emissions regulated herein is installed and operated simultaneously at the facility where the generator is installed and operated, then the electricity savings supplied by the non-emitting electricity source shall be added to the electricity supplied by the generator for the purposes of calculating compliance with the requirements of this regulation, subject to the approval of the Department and in accordance with the following formula for determining such savings:

$$\text{Rate}_{\text{EF}} = (\text{Rate}_{\text{A}}) * [(\text{Size}_{\text{A}})/(\text{Size}_{\text{A}} + \text{Size}_{\text{NER}})]$$

Rate<sub>EF</sub> = effective emission rate of generator, accounting for non-emitting resource(s) (lb/MWh)

Rate<sub>A</sub> = actual emission rate of generator alone (lb/MWh)

Size<sub>A</sub> = actual prime power rating of generator (MW)

Size<sub>NER</sub> = total generating capacity of non-emitting resource(s) (MW)

## Section 07 Record Keeping and Reporting *(OPTIONAL – Up to each state to decide to*

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**include)**

- (a) Record-Keeping Requirements. The owner of a generator shall maintain the following records on the property where the generator is installed, or at such other readily accessible location that the State approves in writing:
- (1) An owner shall monitor the monthly and yearly amounts of fuel, or fuels, consumed by their generators. Yearly fuel consumption shall be calculated and recorded each calendar month by recording (for each fuel) the current calendar month's fuel consumption and adding it to those of the previous eleven consecutive months.
  - (2) A non-resettable hour metering device shall be used by an owner to continuously monitor the monthly and yearly operating hours for each of their generators. Yearly operating hours shall be calculated and recorded each calendar month by recording the current calendar month's operating hours and adding them to those of the previous eleven consecutive months.
  - (3) Monthly and yearly operating hours for an emergency generator. Yearly operating hours during which testing or maintenance occurred shall be calculated and recorded each calendar month by recording the current calendar month's testing or maintenance hours and adding them to those of the previous eleven consecutive months. A brief description of each testing or maintenance performed shall also be recorded.
- (b) Availability of Records. The owner shall maintain each record required by **Section 07(a)** of this regulation for a minimum of five years after the date the record is made. The owner may retain hard copies (e.g., paper) or electronic copies (e.g., compact discs, computer disks, magnetic tape, etc.) of the records. An owner shall promptly provide the original or a copy of a record or records to the State upon request.
- (c) For each generator owned, the generator owner shall submit the original records or a copy of the records as required by Section 07(a), for the preceding calendar year, by *[date to be determined by each state]* to the State.