Permit Boilerplate Procedures For
DIESEL ENGINE-GENERATOR SETS

Purpose:

The purpose of this document is to specify requirements for permit approval for emergency and non-emergency diesel engine-generator sets. **This boilerplate is only for electrical generation engines.** This boilerplate does not apply to diesel engine-generator sets subject to Prevention of Significant Deterioration (PSD) or Non-attainment permit review. The boilerplate is meant to provide a guideline for the minimum requirements of the Virginia Department of Environmental Quality (DEQ). More stringent requirements may be imposed if necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) or other special requirements.

> ****Note:** Virginia currently has two General Permits (GPs) for engine-generator sets: (1) Emergency Generator GP (2) Voluntary Demand Response Generator GP. The facility has the option of getting a general permit or going through the regular minor NSR permitting process.

Definitions:

The following definitions are for use in this permit boilerplate and procedure and do not necessarily have the same meaning in other portions of the regulations.

Ammonia Slip – Ammonia that is not adsorbed in the selective catalytic reduction (SCR) catalyst and is carried out with the exhaust. Typically expressed in parts per million (ppm) at a specified O_2 correction (15% United States, 5% Europe).

Bus Setup - A setup of engine-generator sets where all the engines are grouped together into pods and load is not shared (i.e. 5 engines go towards building A and 6 engines go towards building B, etc.).

Closed Loop SCR – An SCR control system that uses active measurement of nitrogen oxide (NO_X) concentration to adjust the ammonia or urea injection rate. NO_X concentration is measured after the SCR catalyst through the use of a NO_X sensor.

Compression Ignition (CI) Engine - A type of stationary internal combustion engine that is not a spark ignition engine. A diesel engine is a CI engine.

Demand Response - Measures aimed at shifting time of use of electricity from peak-use periods to times of lower demand by inducing retail customers to curtail electricity usage during periods of congestion and higher prices in the electrical grid. Demand response actions are typically undertaken by the source owner in response to a request from a utility or electrical grid system operator or in response to market prices. Demand response participants do not include affected units that are participating in an ISO's Manual 13 Emergency Operations program.

Diesel Fuel - Any liquid obtained from the distillation of petroleum with a boiling point of approximately 150 to 360 degrees Celsius. One commonly used form is number 2 distillate oil.

Diesel Oxidation Catalyst (DOC) - A flow through exhaust device that contains a honeycomb structure covered with a layer of chemical catalyst. This layer contains small amounts of precious metal (usually platinum or palladium) that interact with and oxidize pollutants in the exhaust stream (CO and unburned HCs); therefore, reducing carbon monoxide (CO) emissions.

Diesel Particulate Filter (DPF) – An emission control technology that reduces particulate matter (PM) emissions by trapping the particles in a flow filter substrate and periodically removes the

collected particles by either physical action or by oxidizing (burning off) the particles in a process called regeneration.

Emergency - A condition that arises from sudden and reasonably unforeseeable events where the primary energy or power source is disrupted or disconnected due to conditions beyond the control of an owner or operator of a source including any of the following:

a. A failure of the electrical grid.

b. On-site disaster or equipment failure.

c. Public service emergencies such as flood, fire, natural disaster, or severe weather conditions.

d. An Independent System Operator (ISO) declared emergency, where an ISO emergency is any of the following:

    1. An abnormal system condition requiring manual or automatic action to maintain system frequency, to prevent loss of firm load, equipment damage, or tripping of system elements that could adversely affect the reliability of an electric system or the safety of persons or property.

    2. Capacity deficiency or capacity excess conditions.

    3. A fuel shortage requiring departure from normal operating procedures in order to minimize the use of such scarce fuel.

    4. Abnormal natural events or man-made threats that would require conservative operations to posture the system in a more reliable state.

    5. An abnormal event external to the ISO service territory that may require ISO action.

Engine-generator set - The combination of an electrical generator and an engine mounted together to form a single piece of equipment. This combination is also called a gen-set. In many contexts, the engine is taken for granted and the combined unit is simply called a generator.

Independent System Operator (ISO) - A person that may receive or has received, by transfer pursuant to §56-576 of the Code of Virginia, any ownership or control of, or any responsibility to operate, all or part of the transmission systems in the Commonwealth.

kW_e – The electrical output of the generator in units of kilowatts.

Load Curtailment - An action similar to demand response, with the specific removal or reduction of electrical loads for a limited period of time from a utility grid system in response to a request from the utility or electrical grid system operator.

Load Map - A document that is specific to each SCR which shows the load vs. urea/ammonia solution ratio that is needed to achieve a specified amount of NO_X reduction. This document is created during commissioning of each unit.

Non-emergency – Conditions that are not considered emergency. Peak shaving is considered non-emergency.

Open Looped SCR – An SCR control system that has no NO_X feedback where ammonia/urea injection is based on a unit's load map instead of a NO_X sensor.

Parallel Setup – A setup of engine-generator sets where all the engines are linked into one central electrical line and share load.

Peak Shaving - Measures aimed solely at shifting time of use of electricity from peak-use periods to times of lower demand by inducing retail customers to curtail electricity usage during periods of congestion and higher prices in the electrical grid. Peak shaving is typically undertaken at a source owner's discretion in order to reduce maximum electrical usage and, therefore, cost of electrical service to the source owner. Peak shaver engines are **not** emergency engines.

Selective Catalytic Reduction (SCR) – A control device that reduces the exhaust gas concentration of NO_X by injecting an ammonia solution or urea into the exhaust gas stream, which in the presence of a catalyst, reacts with the NO_X to form nitrogen gas and water vapor.

Spark Ignition (SI) Engine – A natural gas or liquefied petroleum gas fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark ignition engines usually use a throttle to regulate intake air flow to control power during normal operation. Dual-fuel engines in which a liquid fuel (typically diesel fuel) is used for compression ignition and gaseous fuel (typically natural gas) is used as the primary fuel at an annual average ratio of less than 2 parts diesel fuel to 100 parts total fuel on an energy equivalent basis are spark ignition engines.

Stationary Internal Combustion Engine (ICE) means any internal combustion engine, except combustion turbines, that converts heat energy into mechanical work and is not mobile. Stationary ICE differ from mobile ICE in that a stationary internal combustion engine is not a non-road engine as defined at 40 CFR 1068.30 (excluding paragraph (2)(ii) of that definition), and is not used to propel a motor vehicle, aircraft, or a vehicle used solely for competition. Stationary ICE include reciprocating ICE, rotary ICE, and other ICE, except combustion turbines.

Applicability:

This boilerplate applies to construction or any project (which includes any addition or replacement of an emissions unit, any modification to an emissions unit or any combination of these changes) of an emergency or non-emergency diesel engine-generator sets. This procedure document may be used as a guideline for other fuels; however, additional conditions (including different controls) may be required.

> ****Note:** Emergency diesel engine-generator set(s) may be exempt based on size alone per 9 VAC 5-80-1105 B.2.b (aggregate brake horsepower of less than 1,675 horsepower (1,125 kilowatts)). If not exempt by size, then the uncontrolled emissions need to be calculated and compared to the exemption thresholds in 9 VAC 5-80-1105 C or D.

Existing Source Rule 4-8, Emission Standards for Fuel Burning Equipment – Diesel engine-generator sets are not subject to this existing source rule since they are exempt by 9 VAC 5-40-880 E, which states, "The provisions of this article do not apply to stationary internal combustion engines."

State Toxics – Since all diesel engine-generator sets are covered by NESHAP Subpart ZZZZ, state toxics do not apply.

NESHAP, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) – All diesel engine-generator sets (except engines being tested at a stationary RICE test cell/stand) are subject to this Subpart. A source is subject to this subpart "if you own or operate a stationary RICE at a major or area source of HAP emissions." This Subpart includes sections for existing, new, and reconstructed

engines. Certain engines may not have to meet limits, testing, etc. and therefore do not have to comply with the Subpart, but they are still subject to the rule.

> ****Note:** Currently, Virginia does not have delegation of NESHAP Subpart ZZZZ for area sources. Virginia does not take delegation of this federal regulation until those units go into the Title V permit. The regulation language to permit NSPS equipment is in Article 6 and the regulation language where we take authority is in Article 1. Therefore, the permit writer should follow guidance document APG-569: Guidance to Implement and Enforce Non-delegated Federal Regulations.

NSPS, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines – For owners and operators of a diesel engine-generator set, the following units are subject to this Subpart:

New	Modified or Reconstructed
If the facility orders the engine after July 11, 2005 and it is manufactured after April 1, 2006.	Modify or reconstruct after July 11, 2005.

> ****Note:** Currently, Virginia does not have delegation of NSPS Subpart IIII. Virginia does not take delegation of this federal regulation until those units go into the Title V permit. The regulation language to permit NSPS equipment is in Article 6 and the regulation language where we take authority is in Article 1. Therefore, the permit writer should follow guidance document APG-569: Guidance to Implement and Enforce Non-delegated Federal Regulations.

NSPS, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines – Diesel engine-generator sets are not subject to this Subpart since they are compression ignition internal combustion engines; not spark ignition internal combustion engines.

Emission Controls and BACT under Article 6:

Listed below are the conditions/emission limits that are considered presumptive BACT for emergency and/or non-emergency diesel engine-generator sets.

a. Particulate emissions

Emergency engines:
PM emissions shall be controlled by the use of good operating practices and performing appropriate maintenance in accordance with the manufacturer recommendations.

For non-emergency engines:
Particulate emissions shall be controlled by a diesel particulate filter (DPF) with a backpressure monitor that notifies the permittee when the high backpressure limit of the engine is approached. A DPF may be required for this type of engine in order to meet Tier 4 standards.

> ****Note:** This was taken from NSPS Subpart IIII (per §60.4209(b)). Since Virginia does not have delegation of Subpart IIII, the NSPS is not referenced in the permit but the requirement to have a backpressure monitor is included.

For engines with a displacement ≥ 30 liters per cylinder, a limit of 0.15 g/KW-hr (0.11 g/HP-hr) must be met **OR** the diesel particulate filter shall maintain and demonstrate a control efficiency for PM of no less than 60 percent (NSPS Subpart IIII §60.4204(c) and

§60.4205(d)) (see optional sentence in Condition 2 of the boilerplate). Receiving an application for an engine with a displacement ≥ 30 liters per cylinder is atypical.

If a DPF is too cost prohibitive or is not needed to meet the applicable Tier standard, then PM emissions shall be controlled by the use of good operating practices and performing appropriate maintenance in accordance with the manufacturer recommendations.

b. Carbon monoxide emissions

Emergency engines:
CO emissions shall be controlled by the use of good operating practices and performing appropriate maintenance in accordance with the manufacturer recommendations.

Non-emergency engines:
Carbon monoxide (CO) emissions shall be controlled by a diesel oxidation catalyst (DOC). A DOC may be required for this type of engine in order to meet Tier 4 standards.

If a DOC is too cost prohibitive or is not needed to meet the applicable Tier standard, then CO emissions shall be controlled by the use of good operating practices and performing appropriate maintenance in accordance with the manufacturer recommendations.

c. Nitrogen oxide emissions

Emergency engines:

1. Emission limit = 6.0 g/hp-hr

   This BACT limit has been derived and achieved over an extended period of time through actual stack test data from numerous units and various manufacturers.

2. NO_X emissions shall be controlled by electronic fuel injection **and/or** turbocharged engine **and/or** aftercooler **and/or** charge air cooler **and/or** low NO_X emission package. The option(s) that should be chosen are the ones listed on the manufacturer specification sheet, i.e. the design of the engine. These control devices are integral parts of an engine and cannot be made available for inspection. Therefore, the permittee shall maintain documentation that demonstrates the control device has been installed on the engine-generator set(s).

   ****Note:** A SCR is not required for emergency engines as it is for non-emergency engines, but the facility may need to install the control device to meet the BACT emission limit. If so, the SCR system will need to follow the specifications below.

Non-emergency engines:

1. Emission limit = 0.60 g/hp-hr

   This BACT limit has been derived and achieved with NO_X control technology (currently SCR) achieving a 90% reduction.

2. NO_X emissions shall be controlled by an open or closed loop SCR system, meeting the following requirements:

   i. Each SCR system shall be equipped with a temperature probe to continuously monitor the catalyst bed exhaust temperature.

ii. Engine exhaust gas shall be treated with urea or an ammonia solution when the engine(s) are operating at or above 20% load and the catalyst bed exhaust temperature of 570°F is achieved, except for periods of start-up, shutdown, or malfunction. 570°F is the minimum temperature that may be allowed, but this number is always manufacturer specific.

iii. In the event that engine exhaust gas temperature exceeds 930°F, urea or an ammonia solution injection shall be discontinued and any operations above that level will be considered a malfunction. 930°F is the maximum temperature that may be allowed, but this number is always manufacturer specific.

For engines with a displacement ≥ 30 liters per cylinder, a limit of 1.6 g/KW-hr (1.2 g/HP-hr) must be met **OR** the SCR shall maintain and demonstrate a control efficiency for NO_X of no less than 90 percent (NSPS Subpart IIII §60.4204(c) and §60.4205(d)). Receiving an application for an engine with a displacement ≥ 30 liters per cylinder is atypical.

If a NO_X control is too cost prohibitive or is not needed to meet the applicable Tier standard, then NO_X emissions shall be controlled by the use of good operating practices and performing appropriate maintenance in accordance with the manufacturer recommendations.

d. Sulfur dioxide emissions

Emergency and non-emergency engines:
Sulfur Dioxide (SO_2) emissions shall be controlled by the use of low sulfur diesel fuel oil with a sulfur content not to exceed 0.0015% by weight (15ppm).

> ****Note:** This was taken from NSPS Subpart IIII (per §60.4207(b)). Since Virginia does not have delegation of Subpart IIII, the NSPS is not referenced in the permit but the requirement to have a sulfur content of 0.0015% is included.

e. Volatile Organic Compounds (VOC)

Emergency and non-emergency engines:
VOC emissions shall be controlled by the use of good operating practices and performing appropriate maintenance in accordance with the manufacturer recommendations.

f. Visible Emissions (Opacity)

Emergency and non-emergency engines:
Visible emissions shall be controlled by the use of good operating practices and performing appropriate maintenance in accordance with the manufacturer recommendations.

- For emergency engines in an attainment area:
  Visible emissions shall not exceed 10% opacity except during one 6-minute period in any one hour in which visible emissions shall not exceed 20% opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown and malfunction.

- For emergency engines in a nonattainment area:
  Visible emissions shall not exceed 5% opacity except during one 6-minute period in any one hour in which visible emissions shall not exceed 10% opacity as determined

by EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown and malfunction.

- For peak shaver, non-emergency, and emergency engines with SCR:
  Visible emissions shall not exceed 5% opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown and malfunction.

Monitoring:

a. Each engine-generator set shall be equipped with either a (1) non-resettable hour metering device to continuously monitor the operating hours OR (2) fuel flow meter to continuously monitor the fuel throughput. The meter for each engine-generator set shall be observed by the owner with a frequency of not less than once each day the engine-generator set is operated. The owner shall keep a log of these observations.

b. For parallel setups and engines with SCR, each engine-generator set shall also be equipped with a device to monitor and record the engine-generator kilowatt output at a minimum frequency of once every fifteen minutes.

   - For parallel setups: Since the engine-generator sets are all linked into one central electrical line and share load, kilowatt output (i.e. load) needs to be monitored.

   - For engines with SCR: Condition 4 requires that the engine exhaust gas be treated with urea or an ammonia solution when the catalyst bed exhaust temperature and 20% load is reached. The kW monitor is used so that facility is able to demonstrate compliance with this condition.

c. For engine-generator set(s) with a SCR, the following needs to be monitored:

   - The SCR catalyst bed exhaust temperature, and

   - For open loop - the urea/ammonia injection rate, **OR**

   - For closed loop - the NO_X emissions measured after the catalyst, expressed in ppm.

   The information for the SCR shall each be recorded at a minimum frequency of once every fifteen minutes, and correlated to the run date, engine load/kilowatt output, and engine operating hours. Fifteen minutes was chosen as a minimum frequency for averaging purposes.

d. For engine-generator set(s) with a DOC, the DOC catalyst bed temperature needs to be monitored. The information for the DOC shall each be recorded at a minimum frequency of once every fifteen minutes, and correlated to the run date, engine load/kilowatt output, and engine operating hours. Fifteen minutes was chosen as a minimum frequency for averaging purposes

e. For engine-generator set(s) with a DPF, the differential pressure drop across the filter needs to be monitored. The filter shall be observed by the permittee with a frequency as recommended by the process/control equipment manufacturer.

Emission Limits/Calculations:

Permit applicability and emission limit calculations for each diesel engine-generator set should be based on the manufacturer specification sheets. Manufacturer specification sheets are information provided by the manufacturer to the facility that shows the air emissions (usually NO_X, CO, PM, and VOC or HC) for that particular engine-generator set. They should be provided by the facility when submitting an application for a diesel engine-generator set. This is the best information that we can get since it is specific to the type and size of the engine-generator set. If manufacturer specification sheets are not provided by the facility, the permit writer should ask for them during the 30 day review period.

NSPS standards should not be used or compared to the manufacturer specifications since they are weighted averages. The NSPS standards specified in Table 1 (40 CFR 89.112) are measured using the procedures in Subpart E of 40 CFR Part 89. Looking closely into Subpart E (89.404), the test cycles consist of various steady state operating modes that include different combinations of engine speeds and loads, i.e. on a weighted cycle. Technical data that is supplied by the manufacturer is based on 100% load, not on a weighted cycle. Therefore, the NSPS standards do not equate to the manufacturer standards at a given load and cannot be compared together.

In the same manner, AP-42 emission factors should not be used for calculation purposes since the manufacturer specifications are the best emission factors for that specific engine. IF for some reason, on a case-by-case basis, the facility cannot or does not have the manufacturer specification sheets AND there are no other possible emission factors, the AP-42 emission factors may be used. The permit writer should explain the reasoning in the engineering analysis. This should be an infrequent occurrence.

a. Uncontrolled Emissions for Permit Applicability

   Uncontrolled emissions for permit applicability should be calculated using the manufacturer nominal emission factors at the worse case load for that specific engine and pollutant. Load is pollutant specific. For example, NO_X will have the worse case emission factor at 100% load while PM may have a worse case emission factor at 25% load.

b. Emission Limit (lb/hr)

   The engine-generator set lbs/hr emission limit that is placed into the permit for the facility to demonstrate compliance with is the manufacturer Not To Exceed (NTE) standard converted to lbs/hr. An example conversion is below:

   Engine size = 500 hp
   Emission standard = 2.5 g CO/hp-hr

$$\left(\frac{2.5\ g\ CO}{hp-hr}\right) * \left(\frac{1\ lb}{453.6\ g}\right) * (500\ hp) = \frac{2.8\ lbs\ CO}{hr}$$

   If the manufacturer NTE standard is not supplied, the manufacturer nominal standard plus an additional 25% can be used. For example, if the manufacturer nominal standard is 4.0 lbs/hr, the emission limit in the permit would be 4.0 lbs/hr x 1.25 = 5.0 lbs/hr.

c. Emission Limit (tons/yr)

To calculate the annual emission limit in tons/yr for a specific engine-generator set, the manufacturer NTE standard (or the manufacturer nominal standard + 25%) should be multiplied with the engine throughput limit. An example calculation is below:

Engine size = 500 hp
Emission standard = 2.5 g CO/hp-hr
Throughput limit = 1000 hrs/yr

$$\left(\frac{2.5\ g\ CO}{hp-hr}\right) * \left(\frac{1\ lb}{453.6\ g}\right) * (500\ hp) = \frac{2.8\ lbs\ CO}{hr}$$

$$\left(\frac{2.8\ lbs\ CO}{hr}\right) * \left(\frac{1000\ hrs}{yr}\right) * \left(\frac{ton\ CO}{2000\ lbs\ CO}\right) = \frac{1.4\ tons\ CO}{yr}$$

Recordkeeping:

On site records should contain:

a. **[O]** Annual hours of operation of each engine-generator set, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

b. **[O]** Annual consumption of diesel fuel, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

****Note:** Items a and b are optional depending on what kind of throughput condition the facility requested.

c. All fuel supplier certifications.

d. Engine information including make, model, serial number, model year, maximum engine power (bhp), and engine displacement for each engine-generator set.

e. The manufacturer's written operating instructions or procedures developed by the owner/operator that are approved by the engine manufacturer for each engine-generator set.

f. Records of the reasons for operation for each engine-generator set (Ref. Nos. {#s}), including, but not limited to, the date, cause of operation, [cause of the emergency,] [the ISO-declared emergency notification,] [and the hours of operation.]

g. **[O] [***For engines with SCR***]** A NO_X [Urea] [Ammonia Solution] Table ([Urea] [Ammonia Solution] Load Map) for each engine-generator set, (Ref #), equipped with SCR to verify that the SCR is operating as specified by the manufacturer. Each NO_X [Urea] [Ammonia Solution] Table shall include the engine load, temperature after the catalyst, NO_X concentration before and after the catalyst, the [urea] [ammonia solution] consumption rate, and the catalyst efficiency.

h. **[O] [***For engines with SCR***]** Operation and control device monitoring records for each engine-generator set equipped with a SCR (Ref. Nos. {#s}) as required in Condition {condition number}. This includes records of the SCR catalyst exhaust bed temperature and [**[***For open loop SCR***]** [Urea] [Ammonia solution] injection rate] [**[***For closed loop SCR***]** NO_X emission concentration as measured by SCR continuous monitoring device].

i. **[O] [***For engines with DOC***]** Operation and control device monitoring records for each engine-generator set equipped with a DOC (Ref. Nos. {#s}) as required in Condition {condition number}. This includes records of the DOC catalyst bed temperature.

j. **[O] [***For engines with DPF***]** Operation and control device monitoring records for each engine-generator set equipped with a DPF (Ref. Nos. {#s}) as required in Condition {condition number}. This includes records of the differential pressure drop across the filter.

k. **[O] [***For parallel setups and engines with SCR***]** Operation and control device monitoring records for each engine-generator set (Ref. Nos. {#s}) as required in Condition {condition number}.

l. **[O] [***Particulate filter - If control efficiency option is used***]** Control efficiency of the diesel particulate filter using a calculation method approved by the «Region».

m. **[O] [***SCR - If control efficiency option is used***]** Control efficiency of the SCR using a calculation method approved by the «Region».

n. Results of all stack tests and visible emission evaluations.

o. Scheduled and unscheduled maintenance and operator training.

p. **[O]** {other records as required}.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

Initial Notifications:

These initial notifications shall be included in the permit:

a. The actual date on which {construction **or** modification **or** replacement **or** relocation} of the engine-generator set[s] (Ref. Nos. {#s}) commenced within 30 days after such date.

b. The anticipated start-up date of the engine-generator set[s] (Ref. Nos. {#s}) postmarked not more than 60 days nor less than 30 days prior to such date.

c. The actual start-up date of the engine-generator set[s] (Ref. Nos. {#s}) within 15 days after such date. The actual start-up date shall be the date on which each engine completes manufacturer's trials, but shall be no later than thirty days after the initial start up for manufacturer's trials.

d. The anticipated date of the performance tests and visible emissions evaluation of the engine-generator set[s] (Ref. Nos. {#s}) postmarked at least 30 days prior to such date.

Testing Requirements:

Initial Compliance Determinations:

Initial VEE: This boilerplate does contain a requirement for an initial visible emissions evaluation for peak shaver and non-emergency engine-generator sets. An initial visible emissions evaluation shall be conducted to show that the unit is in compliance with the appropriate opacity standard. Each test shall consist of 30 sets of 24 consecutive observations (at 15 second intervals) to yield a six minute average. Testing shall be conducted with the engine(s) operating at greater than 90% capacity, unless multiple load band testing is approved by DEQ.

Initial Stack Testing: This boilerplate does contain a requirement for stack testing for peak shaver and non-emergency engine-generator sets. Initial performance tests shall be conducted for NO_X to determine compliance with the emission limits and, if necessary, control efficiency requirements, listed in the permit. CO is an optional pollutant to be tested based on if BACT is required on a case-by-case basis. Emissions testing of each pollutant for each selected engine-generator set shall consist of three one-hour test runs under load. The average of the three runs shall be reported as the short-term emission rate for that engine-generator set. Testing shall be conducted with the engine(s) operating at greater than 90% capacity, unless multiple load band testing is approved by DEQ.

Initial VEE and Stack Testing: A facility may install one non-emergency engine-generator set or it may install 20 identical non-emergency engine-generator sets. If multiple engines are installed, we do not require that every engine-generator set be tested. Instead, it is only required that one engine-generator set be tested for an initial VEE and stack testing. **The tested engine-generator set will be designated by DEQ.**