

**AIR POLLUTION CONTROL DISTRICT  
COUNTY OF SAN DIEGO**

**AMENDED RULE 69.3.1 - STATIONARY GAS TURBINE ENGINES – BEST  
AVAILABLE RETROFIT CONTROL TECHNOLOGY**

**WORKSHOP REPORT**

A workshop notice was mailed to owners and operators of stationary gas turbines in San Diego County. Notices were also mailed to all Economic Development Corporations and Chambers of Commerce in San Diego County, the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and other interested parties.

The workshop was held on August 3, 2007, and was attended by 21 people. Oral and written comments were also received before, during, and after the workshop. The workshop comments and District responses are as follows:

**1. WORKSHOP COMMENT**

If a shutdown occurs during a startup, does it reset the clock for the startup?

**DISTRICT RESPONSE**

Yes. For purposes of this rule, upon completion of a shutdown, the subsequent startup will always have a new startup exemption period of 120 minutes. If the shutdown occurred during an extended startup for a combined-cycle turbine, the proposed rule would require that key operating parameters indicated an extended startup of up to 360 minutes was necessary for compliance with the rule NOx standards. Otherwise, only 120 minutes would be allowed to complete the startup. However, other requirements such as best available control technology (BACT) determinations under the District new source review (NSR) rules may place more stringent startup and shutdown requirements on individual units. These requirements would be reflected in a unit's permit condition.

**2. WORKSHOP COMMENT**

What brought about the need to include the proposed extended startup time of six hours for combined-cycle turbines?

**DISTRICT RESPONSE**

During startup, key components of the associated steam power system portion of the combined-cycle process undergo thermal stresses due to expansion of the metal components. These stresses are largest, and the potential for damage greatest, when the steam turbine has been allowed to cool for several days to near ambient temperature—often referred to as a “cold start.” Thus, the rate at which the steam system may be heated during a startup is limited to prevent damage to the equipment. The heating rate of the steam turbine depends on the size of the turbine. In general, the larger the turbine the slower the allowable heating rate to prevent

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damage because the thickness of metal in the turbine components increases with steam turbine size, which increases the susceptibility to thermal stress. A traditional combined-cycle power plant achieves the necessary low heating rate by running the gas turbines at very low loads until the steam turbine is sufficiently heated to begin normal operation. This limits the steam temperature and amount of steam sent to the steam turbine but also generates higher NO<sub>x</sub> emissions for a longer period during the startup since the gas turbine is unable to operate in its lowest NO<sub>x</sub> emitting combustion mode and add-on control systems such as selective catalytic reduction (SCR) systems are not as efficient at lower temperature.

As a result of these and other technological constraints on the plant equipment, large combined-cycle power plants operating in California are generally allowed startup durations of more than 120 minutes to comply with oxides of nitrogen (NO<sub>x</sub>) limits established by best available control technology (BACT) or best available retrofit control technology (BARCT) requirements.

A typical large combine-cycle power plant would have an overall power rating of 550 megawatts (MW) with two gas turbines rated at 170 MW each. Although there are methods to allow the gas turbines to operate at a higher load during a startup and shorten the time necessary to comply with NO<sub>x</sub> limits, retrofitting existing large combine-cycle power plants to use these methods would be prohibitively expensive.

Because of this technical issue, the District is proposing to amend Rule 69.3.1 to extend the time allowed to comply with the Rule 69.3.1 NO<sub>x</sub> limits in Subsection (d)(1) for combined-cycle turbines (an extended startup). The extended startup time allowed could be up to an additional 240 minutes beyond the existing 120-minute startup time, for a total startup time of 360 minutes, but only under certain limited conditions (i.e., a cold start) where a 120-minute startup might damage critical equipment. The proposed rule change does not prevent the District from imposing startup times of less than 360 minutes if it is determined feasible. There are several smaller combined-cycle turbines (50 MW or less) operating in San Diego County that, because of their small size, can meet the existing 120-minute startup time, and this is reflected in their permit conditions.

District Rule 69.3, Stationary Gas Turbine Engines—Reasonably Available Control Technology, startup provisions are not being amended and are uniformly 120 minutes for all units. This rule is also applicable to the same turbines affected by the proposed extended startup time in Rule 69.3.1. Rule 69.3 limits NO<sub>x</sub> exhaust concentration to 42 ppmv (parts per million by volume) for gas-fueled units (65 ppmv for liquid fueled-units) and thereby, indirectly, will limit emissions during all extended startups lasting more than 120 minutes. The NO<sub>x</sub> limit in Rule 69.3.1 for periods excluding startups, shutdowns, and fuel changes is about 12 ppmv for large combined-cycle turbines.

Based on recent operational experience at a large combined-cycle facility in San Diego County, the District anticipates that the allowed longer startup time will only be required a few times (once or twice) a year for large combined-cycle facilities after they begin commercial operation. With the proposed amendments, the much more frequent regular startups will still be limited to 120 minutes or less as allowed by the current rule.

Please also see the response to Comment No. 19.

**3. WORKSHOP COMMENT**

Can a combined-cycle plant be configured to startup in less than six hours?

**DISTRICT RESPONSE**

With the installation of the proper equipment, large combined-cycle power plants can achieve NOx emission standards in less than six hours during a cold start. However, installation of this equipment at existing facilities is prohibitively expensive. Equipment that a combined-cycle plant could utilize to potentially reduce cold start times to less than six hours includes an auxiliary boilers to provide warming steam for the steam turbine and/or heat recovery steam generator (HRSG), an air injection system to cool the gas turbine exhaust stream, equipment to allow up to 100% of the steam generated in the HRSG to bypass the steam turbine, and an enhanced and well controlled steam attemperation system to cool inlet steam to the steam turbine.

The District examined the startup requirements for thirteen existing combined-cycle plants in California. Four of these combined-cycle plants have permit conditions allowing a duration of four hours or less for an extended startup. In some of these cases, the ability to comply with NOx standards during a startup may rely on longer averaging times than that allowed in Rule 69.3.1(one clock hour). The other nine plants have periods of six hours for extended startups, which is consistent with the maximum duration being proposed for Rule 69.3.1 for an extended startup. Based on this information the District has determined that six hours is the appropriate maximum startup time period to allow for combined-cycle turbines to achieve the NOx standards of Rule 69.3.1.

**4. WORKSHOP COMMENT**

Does the definition of a “combined-cycle gas turbine engine” also include auxiliary equipment (e.g., steam turbine, generator and other connecting equipment)?

**DISTRICT RESPONSE**

A combined-cycle gas turbine engine refers only to the stationary gas turbine engine system. This does not include auxiliary equipment such as the steam turbine or electrical generator not relevant to the turbine’s emissions except in so far as monitoring of the output from such devices might be required to verify compliance with the rule. However, it would include emissions from additional combustion equipment using the turbine exhaust (duct burner), any add-on emission control equipment such as a selective catalytic reduction system (SCR); and any other equipment that was necessary for the turbine to meet the requirements of Rule 69.3.1 except any equipment that the District would permit separately such as a gas- or liquid-fueled starter engine or auxiliary boiler.

**5. WORKSHOP COMMENT**

If auxiliary equipment malfunctioned and caused an increase in emissions to occur, would that be considered a breakdown?

**DISTRICT RESPONSE**

Yes. District Rule 98 defines a breakdown condition to include an unforeseeable failure or malfunction of any air pollution control equipment or related operating equipment that causes a violation of any emission standard. In the event of a breakdown condition, the owner or operator must notify the District no later than two hours after detecting the breakdown condition and must comply with all other applicable requirements of Rule 98.

**6. WORKSHOP COMMENT**

Does the proposed revision to the definition of “shutdown” apply to units without an installed CEMS?

**DISTRICT RESPONSE**

No. The proposed additional language to the definitions of “shutdown” and “startup” are intended to clarify that a shutdown or startup occurs relative to when fuel flow begins or ceases, as applicable, only to gas turbine engines equipped with a continuous emission monitoring system (CEMS) or other continuous monitoring system that tracks fuel flow on a minute-by-minute basis. The proposed language does not redefine when shutdowns and startups occur for gas turbine engines without such a continuous monitoring system.

**7. WORKSHOP COMMENT**

Would the proposed emissions limit that was discussed during the workshop as an alternative to prohibition of operation on days with a forecast ozone exceedance for peaking units subject to Subsection (d)(2) be for a 1-hr or 24-hr period?

**DISTRICT RESPONSE**

As noted by the comment, at the workshop the District discussed a declining NOx mass emission limit as an alternative to the proposed prohibition of operation on forecast ozone exceedance days at the workshop. Based on comments during the workshop and subsequent discussions with the affected facilities and other stakeholders, the District is now proposing a calendar-day NOx mass emission limit for peaking units with a power rating greater than four MW installed prior to December 16, 1998, that are subject to the less stringent emission limits of Subsection (d)(2). The limit is only applied to those units installed before 1998 because any future units would be subject to emission limits established pursuant to best available control technology (BACT) requirements (all units that would be subject to the limit were actually installed prior to 1979 and were not subject to BACT).

To provide maximum flexibility of operation, the proposed limit is a limit on the aggregate NOx emissions from all the affected units that are under common ownership. In addition, the limit does not apply if an electrical emergency is declared by the California Independent System Operator (CAISO) or, in some cases the local serving utility, such that the operations of units subject to the limit are necessary to provide electrical grid reliability.

An intermediate daily NOx mass limit is applicable for 2012–2014. The limit declines to the final level beginning in 2015. For gas-fueled units, the final limit is set so that total emissions would not exceed emissions that would occur if the units operated at the maximum level in the recent past and were in compliance with Subsection (d)(1). For units that are gas-fueled, the District estimates that the initial limit allows a maximum of about twelve hours of operation in a calendar day and the final limit allows about eight hours of operation in a calendar day if all the turbines are operated. Because the limit is an aggregate limit over all the units under common ownership, some units could operate for longer periods than the maximums if other units are not operated. For the single solely liquid-fueled unit, the District estimates that the final limit allows about 10 hours per day of operation. However, it appears likely that the solely liquid fueled unit can comply with Subsection (d)(1), in which case it would not be subject to the daily NOx mass emission limit.

Please also see the response to Comment Nos. 28 and 39.

## **8. WORKSHOP COMMENT**

If a peaking turbine currently subject to Subsection (d)(2) operates on an ozone exceedance day, would that unit be subject to the more stringent standards in Subsection (d)(1)?

### **DISTRICT RESPONSE**

No. On a forecast ozone exceedance day, the aggregate NOx emissions from the unit and all other units under common ownership would be subject to the applicable calendar-day NOx mass emission limit in Subsection (d)(3). In addition, the units would be subject to the NOx concentration standards in Subsection (d)(2). If there were an electrical system emergency, then only the concentration standards of Subsection (d)(2) would apply.

A facility could elect to demonstrate compliance with the concentration standards of Subsection (d)(1) in lieu of compliance with Subsection (d)(3) on forecast ozone exceedance days. Please also see the response to Comment Nos. 7 and 28.

## **9. WORKSHOP COMMENT**

How will emissions be determined for peaking units subject to Subsection (d)(2) that do not have a CEMS installed?

**DISTRICT RESPONSE**

As specified in Subsection (e)(10) of the post-workshop proposed amended rule, a unit's emissions will be calculated by a protocol based on a relevant and easily and currently monitored operating parameter such as fuel use or electrical energy output and an appropriate emission factor determined from the most recent source test of the unit.

**10. WORKSHOP COMMENT**

Does the addition of "fuel flow rate" in the list of parameters to be monitored in Subsection (e)(1) require that a fuel meter be installed?

**DISTRICT RESPONSE**

No. Subsection (e)(1) only provides some examples of parameters that the District may require to be recorded in order to demonstrate compliance with the rule. A fuel flow meter would only be required if the District determined it was necessary to demonstrate compliance and an alternative was not feasible. Please also see the response to Comment Nos. 12, 23, and 34.

**11. WORKSHOP COMMENT**

Is the District going to propose a new emissions limit expressed as pounds of NO<sub>x</sub> per million British thermal units (lb/MMBtu) that would require monitoring of fuel usage?

**DISTRICT RESPONSE**

No. The oxides of nitrogen (NO<sub>x</sub>) emission standards in Subsections (d)(1) and (d)(2), which are based on NO<sub>x</sub> concentration in the turbine exhaust, are not being revised at this time.

**12. WORKSHOP COMMENT**

Would it be appropriate to have energy output megawatt-hours (MW-hr) as one of the parameters to monitor and record in Subsection (e)(1)?

**DISTRICT RESPONSE**

Subsection (e)(1) in the post-workshop rule proposal clarifies that other parameters not explicitly listed under (e)(1) may be required to be monitored and recorded as determined necessary by the District. For example, if compliance with the proposed calendar-day NO<sub>x</sub> mass emission limit in Subsection (d)(3) was based on an emission factor expressed as pounds per megawatt-hour (MW-hr), then monitoring of a unit's calendar-day MW-hr output would be necessary. Please also see the response to Workshop Comment Nos. 10, 23, and 34.

**13. WORKSHOP COMMENT**

Can a commissioning grace period be included in Rule 69.3.1 that would allow a newly installed turbine a specific timeframe after initial startup to come into compliance with the emissions standards of the rule?

**DISTRICT RESPONSE**

During the commissioning process, it is sometimes necessary to operate fuel combustion equipment (e.g., turbines and engines) while the emissions control equipment is not fully operational. Since the control technology is not in operation during this time, a facility could potentially be in violation of District's rules. The District has studied the feasibility of developing a new rule that would specifically address commissioning periods and provide adequate time for a facility to achieve compliance with District rules. This study indicated that commissioning periods vary significantly, depending upon factors such as the equipment configuration and operating parameters specific to each particular site. Thus, commissioning periods are best determined on a case-by-case basis.

A facility that either is, or will be, in violation of a District rule has the option of petitioning for a variance from the District Hearing Board. A variance is an administrative order granting temporary relief from a District rule for a specific period of time based on the particular circumstances of each case. If granted, a variance would allow a facility to operate while implementing the necessary measures to achieve compliance with the applicable rules.

**14. WORKSHOP COMMENT**

Does the rule go into effect on the date of adoption?

**DISTRICT RESPONSE**

Yes. The rule will go into effect on the date the rule is adopted. However, the provisions regarding the proposed daily NOx mass emission limit for certain units are not applicable until 2012.

**15. WORKSHOP COMMENT**

How was the July 1, 2010, compliance date, specified in Subsection (d)(3), determined for units not in compliance with Subsection (d)(1)?

**DISTRICT RESPONSE**

The compliance date was selected to allow enough time for the affected facilities to install control equipment to comply with the NOx exhaust concentration standards of Subsection (d)(1) rather than the daily mass emission limit of Subsection (d)(3) if they elected this method of compliance or to establish an District approved emission calculation protocol and implement

emission monitoring to ensure compliance with Subsection (d)(3). Because of the time elapsed since the workshop, the compliance date in Subsection (d)(3) has been revised to January 1, 2012, in order to provide affected facilities an adequate time period to comply.

**16. WORKSHOP COMMENT**

Is there a possibility that the July 1, 2010, compliance date could change to a later date?

**DISTRICT RESPONSE**

Please see the response to Comment No. 15.

**17. WORKSHOP COMMENT**

Can the NO<sub>x</sub> emissions limit be modified for peaking units subject to Subsection (d)(2) so that they would be required to operate at a lower NO<sub>x</sub> limit during ozone exceedance days?

**DISTRICT RESPONSE**

To provide operational flexibility for the affected units, the District is replacing the prohibition of operation proposed in the workshop draft with a calendar-day NO<sub>x</sub> mass emission limit based on NO<sub>x</sub> emissions aggregated over all units under common ownership. There is also the option of a unit demonstrating compliance with the exhaust concentration emission standards of Subsection (d)(1). In this case, the unit would not be subject to the daily NO<sub>x</sub> mass emission limit. Please see also the response to Comment No. 7.

**18. WORKSHOP COMMENT**

Instead of a proposed emissions limit for peaking units subject to Subsection (d)(2), can a facility offset emissions from the unit with emissions reduced from other equipment operating at the same site?

**DISTRICT RESPONSE**

No. Rule 69.3.1 sets best available retrofit control technology (BARCT) standards for NO<sub>x</sub> emissions from stationary combustion turbines. For peaking units larger than four MW subject to Subsection (d)(2), the District has determined that the proposed daily NO<sub>x</sub> emission limits of Subsection (d)(3) are feasible and cost-effective. Emissions reductions from other equipment do not address BARCT and, therefore, cannot be used as a substitute for the standards in the rule. In addition, even if such offsets were allowed, the District does not believe this is feasible since the proposed NO<sub>x</sub> mass emission limit is on a calendar-day basis. It is not clear what baseline would be used to determine the daily emission reductions from other units on a given day.



## **19. WRITTEN COMMENT**

What brought about the need to include the proposed exemption for turbines equipped with lean premix combustors [also known as dry low NOx (DLN) combustors] during periods of operation at low load? Are there many units that need to operate at less than 50% load due to reduced power demand?

### **DISTRICT RESPONSE**

Gas turbines do not typically operate at less than 50% load because turbine efficiency rapidly declines below 50% load and that was not the issue this provision was intended to address. On large combined-cycle turbines, the low-load situation (sometimes referred to as a "run-back") often arises when combustion turbine monitoring software detects a possible combustion problem with the turbine. Newer turbines, especially large combined-cycle turbines, achieving very low NOx before any add-on controls typically run in an extremely lean (low fuel to air ratio) premixed mode. Because they are running extremely lean, any combustion instability could lead to a loss of combustion (flame-out), which would result in a restart of the turbine. To prevent this, if a combustion problem is detected, the turbine load is rapidly reduced until it enters the more stable—but higher emitting—diffusion flame mode. In most cases, the problem is solved (or determined not to be a problem) relatively quickly. The turbine can then be returned to normal operations at higher load without actually shutting down. However, since no shutdown has occurred, under the existing rule the turbine may potentially not comply with the NOx exhaust concentration standards in Subsection (d)(1) as a result of the excess NOx emissions during the period of operation at low load.

The turbine could be shutdown and then restarted and be in compliance with Rule 69.3.1 by utilizing the standard exemption periods for shutdowns and startups in the rule. However, this would potentially generate more emissions than simply returning to normal operations without shutting down the turbine since under the rule the unit would be exempt from the rule standards for two hours during the subsequent startup (and for two hours prior to the shutdown).

In addition, the District has encountered a situation where a facility was ordered by the California Independent System Operator (CAISO) to shutdown a simple-cycle peaking turbine—equipped with a lean premix combustor—and then subsequently ordered by CAISO to come back online before it had completed the shutdown. This facility received a notice of violation from the District when NOx permit limits implementing best available control technology (BACT) were exceeded as result of the turbine being operated at low load for a short period. Again, if the turbine had continued to a complete shutdown, it would have been in compliance but also would not have been providing the needed power. BACT limits are more stringent than Rule 69.3.1 standards. However, there is a small possibility that a similar situation could result in the exceedance of the Rule 69.3.1 standards.

To address these and similar situations, the District has proposed the limited low-load exemption in Rule 69.3.1. The proposed exemption would address the above situations and other situations that might arise that require turbines with lean premix combustors to temporarily reduced power to a low load level where the lean premix combustion system is ineffective or inoperative. The District believes this type of problem is temporary and relatively infrequent based on a review of

CEMS data from a large combined-cycle power plant. Therefore, the low-load exemption is limited in duration on a daily and annual basis.

**20. WRITTEN COMMENT**

Did the District consider a maximum NOx limit for units operating at low load?

**DISTRICT RESPONSE**

District Rule 69.3, Stationary Gas Turbine Engines—Reasonably Available Control Technology, is also applicable to turbines subject to Rule 69.3.1. The District is not proposing to include the low-load exemption in Rule 69.3. Therefore, this effectively limits the allowed NOx emissions to 42 parts per million by volume (ppmv) for gas-fueled units and 65 ppmv for liquid-fueled units during low-load operational periods for gas- and liquid-fueled units, respectively.

**21. WRITTEN COMMENT**

Fourteen peaking units operating in San Diego County and potentially subject to Subsection (d)(3) limits are relied upon for contingency purposes. In addition to being able to respond to the California Independent System Operator declared Stage 1, 2, or 3 emergencies, these units provide local reliability in certain situations. These include contingency coverage for potential transmission or generation failures, coverage for underestimated or extreme electrical load conditions, responding to local reliability problems in the event of transmission line outages, and availability to provide back-feed power to restart other units in the event of a system failure.

In order to account for emergency and non-emergency events that may threaten transmission system reliability, the definition of “Electrical Grid Emergency” should be revised to “Electrical Grid Reliability Event” and defined as:

*the condition of the electrical grid as determined by the California Independent System Operator or a successor agency, or San Diego Gas & Electric’s transmission operations department is, or will be, such that the reliability of the electrical grid is threatened. Electrical grid reliability events include, but are not limited to, Stage 1, Stage 2, or Stage 3 Emergency Notices; Transmission Emergency Notices; or System Emergencies declared by the California Independent System Operator that are applicable to San Diego County or the State as a whole, transmission or generation contingencies, unanticipated or extreme electrical demand, or prevention of transmission equipment damage. Restricted maintenance operation notices to facilities, power watches urging consumers to conserve electricity, alerts advising of marginal conditions the next day, and warnings advising of marginal conditions the next hour issued by the California Independent System Operator are not by themselves considered electrical emergencies.*

**DISTRICT RESPONSE**

The District agrees. The term “Electrical Grid Emergency” has been changed to “System Emergency” and the definition revised to address this issue.

**22. WRITTEN COMMENT**

For consistency, Subsection (d)(3)(ii) should be revised to:

*An Electric Grid Reliability Event has occurred, as defined in Subsection (c)(4), during the calendar day on which the gas turbine operates.*

**DISTRICT RESPONSE**

To clarify exemptions during electrical system emergencies to the proposed calendar-day NOx mass emission limit in Subsection (d)(3), Subsection (b)(5) has been added which exempts a unit from the provisions of Subsection (d)(3) on a calendar day when a system emergency has been declared or if operation of one or more emission units are necessary to protect transmission system reliability.

**23. WRITTEN COMMENT**

One of the parameters that is monitored and recorded at a particular facility operating a peaking turbine is SCR average temperature. Thus, Subsection (e)(1)(vi) should be revised to include this parameter.

**DISTRICT RESPONSE**

The suggested revision is not necessary because Subsection (e)(1) is not an all inclusive list of parameters that must be monitored and recorded, and thus does not preclude any parameters not explicitly listed. Please also see the response to Comment Nos. 10, 12, and 34.

**24. WRITTEN COMMENT**

The recordkeeping requirements proposed in Subsection (e)(6) pertaining to non-exceedance days and electrical emergencies apply only to peaking units subject to Subsection (d)(2). For clarification, Subsection (e)(6) should be revised to reference Subsection (d)(2).

**DISTRICT RESPONSE**

Subsections (e)(10) and (e)(11) have been added to clarify the records required for units subject to Subsection (d)(2) and Subsection (d)(3).

**25. WRITTEN COMMENT**

Some peaking turbines may operate on natural gas only or be installed without a dry low NOx combustor. Therefore, parameters like fuel change and operation at low load may not apply. For clarification, Subsection (g)(7) should be revised to:

*For the purposes of compliance determination, the clock hour average NOx emissions concentration shall not include the data during periods of startup, shutdown, fuel change and operation at low load, as applicable for the type of unit.*

**DISTRICT RESPONSE**

The District agrees. Proposed Subsection (g)(7) has been revised as suggested.

**26. WRITTEN COMMENT**

An existing peaking turbine is currently permitted to operate no more than 876 hours per year. At the facility, one natural gas fired steam boiler must be in operation to provide steam to the peaking turbine for steam injection NOx control. If no steam boilers are operating at the time a compliance test is performed on the peaking unit, a steam boiler must be started several hours in advance of the test and continue operating until the test is completed. Operation of the gas fired steam boiler would result in significant emissions.

The proposed revisions to Rule 69.3.1 may require the operator to run the combustion turbine for the sole purpose of completing an annual source test. In 2006, the aforementioned peaking turbine was operated 33.7 hours on oil fuel, of which about three hours were used to conduct an annual compliance test.

Therefore, it is requested that, as applicable to peaking turbines that operate less than 877 hours per year, the District amend Rule 69.3.1 to allow a longer interval between compliance tests than the 12-month period proposed in the rule. An interval of 25 months between compliance tests, similar to the period provided in Bay Area AQMD's Regulation 9, Rule 9, would be a more reasonable requirement.

**DISTRICT RESPONSE**

The District disagrees. Because of the high potential emissions from this unit, the District believes the annual compliance tests are appropriate. The District will make every effort to schedule the annual source test when steam is available to the unit.

**27. POST-WORKSHOP WRITTEN COMMENT**

Please confirm by response that a CAM plan will be used to determine compliance with the NOx concentration limits in (d)(1) and (d)(2) since some subject units are not required to be equipped with a CEMS.

**DISTRICT RESPONSE**

In general, compliance assurance monitoring (CAM) can be used to determine compliance with the NO<sub>x</sub> emission standards of Subsection (d)(1) and (d)(2). However, this does not preclude source test results and any other credible evidence being used to determine compliance. A source test would most likely take precedence over CAM because it is a direct measure of emissions.

**28. POST-WORKSHOP WRITTEN COMMENT**

Please confirm by response that a peaking unit is exempted from NO<sub>x</sub> mass emission limits in (d)(3)(ii) or (d)(3)(iii) if the last annual source test resulted in a NO<sub>x</sub> concentration that is less than or equal to the NO<sub>x</sub> concentration limits identified in (d)(1) until the results of the next annual source test is published. For example, if the last source test resulted in a NO<sub>x</sub> concentration of 40 ppm @15% O<sub>2</sub> for a liquid-fueled unit, the unit would be exempted from NO<sub>x</sub> mass emission limits in (d)(3)(iii).

**DISTRICT RESPONSE**

A unit potentially subject to Subsection (d)(3) operating in compliance with the NO<sub>x</sub> standards of Subsection (d)(1) of the proposed amended rule is not subject to the proposed calendar-day NO<sub>x</sub> mass emission limits as specified in Subsection (d)(3). The compliance determination would be based on the most recent source test as approved by the District. Thus, if a liquid-fueled unit with a unit thermal efficiency less than 25% operates at 42 parts per million by volume, dry, (ppmv<sub>d</sub>) NO<sub>x</sub> at 15% O<sub>2</sub> or less, i.e., in compliance with Subsection (d)(1), as determined by the most recent approved source test, Subsection (d)(3) would not be applicable to that unit. If a subsequent source test or other credible evidence showed the unit was not in compliance with Subsection (d)(1), it would then become subject to Subsection (d)(3).

**29. POST-WORKSHOP WRITTEN COMMENT**

Please remove or define the word "reconstructed" in (d)(4). If not removed, please confirm by response that a gas turbine may be rebuilt using like-kind (or OEM parts supplied by manufacturer or third-party manufacturer) parts to maintain the GT in good operating condition without triggering lower NO<sub>x</sub> emission limits. This would also include temporary replacement of the GT if the existing GT is removed for maintenance purposes or permanent replacement of the GT with like-kind GT should the existing GT become un-repairable.

**DISTRICT RESPONSE**

The District has deleted the language concerning "reconstruction" as suggested and also the language regarding turbine replacement from proposed Subsection (d)(4). Reconstruction or replacement of a unit is addressed under District new source review (NSR) rules and does not need to be included in Rule 69.3.1.

**30. POST-WORKSHOP WRITTEN COMMENT**

What documentation will be required to confirm the occurrence of a "System Emergency" (c)(27) as determined by the CAISO or SDG&E?

**DISTRICT RESPONSE**

Written documentation in the form of an e-mail, letter, or fax directly from CAISO or SDG&E, or printout of a notification via their respective websites would suffice to confirm a system emergency had occurred on a given day.

**31. POST-WORKSHOP WRITTEN COMMENT**

Please add the word "mass" at (e)(10,) between the words which occur three times as "NOx emissions". "NOx emissions" becomes "NOx mass emissions" in all three occurrences in (e)(10) in the post-workshop draft of the rule.

**DISTRICT RESPONSE**

The District agrees. Subsection (e)(10) has been revised as suggested.

**32. POST-WORKSHOP WRITTEN COMMENT**

Rule 69.3.1(d)(3):

*“Notwithstanding Subsection (d)(2), on or after January 1, 2011, a person shall not operate a peaking unit with a power rating greater than or equal to 4 megawatts that was installed on or before December 16, 1998, and that does not comply with the emissions concentration limits specified in Subsection (d)(1), unless the Air Pollution Control Officer has determined that an exceedance of the federal eight-hour ambient air quality standard for ozone is not predicted at any location in the air basin at any time during the calendar day on which the gas turbine operates, or the following standards are complied with...”*

We request confirmation that on forecasted federal 8-hour standard exceedance days, that meeting the aggregate NOx emission limit proposed in the post-workshop draft is adequate for complying with the rule. As the rule is currently written, it is not sufficiently clear which emission limit applies on forecast exceedance days to facilities not meeting the NOx ppm limits in Subsection (d)(1).

### **DISTRICT RESPONSE**

On forecast ozone exceedance days, peaking units subject to (d)(2) and (d)(3) must comply with both the concentration limits specified in Subsection (d)(2) and the calendar-day NOx mass emission limit specified in Subsection (d)(3) to comply with the rule as proposed. On days when an ozone exceedance is not forecast, such units must comply with Subsection (d)(2), but not Subsection (d)(3). The units must also only comply with Subsection (d)(2) on days when an ozone exceedance is not forecast but an exceedance actually occurs. Please also see the responses to Comment Nos. 22 and 28.

### **33. POST-WORKSHOP WRITTEN COMMENT**

We request that the effective date in Rule 69.3.1 (d)(3) be changed, from January 1, 2011, to January 1, 2012, giving our facilities two years to implement required infrastructure, monitoring, and recordkeeping changes required by the rule, rather than only 17 months, assuming an early August 2009 adoption date of the proposed amended rule. The additional time is consistent with the initial draft of the proposed amended rule dated August 3, 2007, which gave facilities until July 1, 2010, or nearly three years from the draft date, to comply with the changes.

*“Notwithstanding Subsection (d)(2), on or after January 1, 2012, a person shall not operate ...”*

For consistency with the requested change in the effective date of Rule 69.3.1, Subsection (d)(3), we also request that the effective dates in Subsections (d)(3)(ii)(A), (d)(3)(ii)(B), and (d)(3)(iii)(B) be correspondingly advanced.

### **DISTRICT RESPONSE**

The District agrees. The effective dates in Subsections (d)(3), (d)(3)(ii)(A), (d)(3)(ii)(B), and (d)(3)(iii)(B) have been revised accordingly.

### **34. POST-WORKSHOP WRITTEN COMMENT**

Rule 69.3.1(e)(1):

*“An owner or operator of a unit which is subject to the requirements of Section (d) shall install, calibrate and maintain continuous monitors in accordance with the manufacturer's recommended procedures to monitor and record the operational characteristics of the unit and of any NOx emissions reduction system, as applicable, to demonstrate continuous compliance, such as:*

*(i) fuel flow rate;*

*(ii) exhaust gas temperature;*

*(iii) ammonia injection rate; ...*

Our company operates 13 peaker units in the San Diego Air Basin that will be subject to this rule. Each facility will be required to install a monitoring system for each system to track the operational parameters listed in the rule and signal when operations must be ceased on days when the aggregate NOx emission limit in Subsection (d)(3)(ii) is close to being exceeded. Currently, we do not have this level of instrumentation. To guarantee that the daily aggregate NOx emission limit will not be exceeded on any day of the year, regardless of when an exceedance of the federal 8-hour ozone standard is predicted because of item #1 above, we estimate a cost of at least \$25,000 to possibly \$100,000+ per unit, depending on the complexity and redundancy necessary to prevent an emission violation.

### **DISTRICT RESPONSE**

The District disagrees. Subsection (e)(1) only provides some examples of parameters that the District may require to be recorded in order to demonstrate compliance with the rule. These examples are not all inclusive nor does it imply that all of the examples listed must be monitored. Only those parameters that the District determines necessary to monitor to determine compliance for a specific unit need to be monitored. In determining which parameters need to be monitored to verify compliance, the District endeavors to minimize monitoring and recordkeeping burdens while requiring sufficient monitoring to verify compliance with the rule.

In the case of units subject to Subsection (3), the District anticipates that monitoring calendar-day energy output in MW-hr combined with an emission factor(s) expressed in pounds per MW-hr would be sufficient to determine compliance with the calendar-day aggregate NOx mass emission limit of Subsection (d)(3). The District notes that these units' energy output is already closely monitored and recorded for business purposes.

However, in response to concerns regarding the monitoring and recordkeeping burden of the proposed calendar-day NOx mass emission limit of Subsection (d)(3), language has been added to (e)(10) to allow a surrogate to actual emissions (for example, MW-hr or hours of operation) to be monitored and recorded as an indicator of compliance in lieu of calculating mass emissions each day. In this case emissions, only need be calculated by the owner or operator if the surrogate indicates potential noncompliance with the calendar-day mass emission limit.

Please also see the response to Comment Nos. 10, 12, and 37.

### **35. POST-WORKSHOP WRITTEN COMMENT**

As the rule stands now, our company's turbines will only be allowed to operate a maximum of about 11-12 hours on any day of the year, which seems insufficient to meet electricity demands on peak use days. In the event that we are limited in our operation and must shutdown to avoid violating the aggregate emission limits, local businesses may elect to operate their emergency generators, resulting in higher NOx emissions than our peaking turbines. As a result, the overall benefits to the air quality expected through the implementation of the revised rule will potentially not be achieved.



We request that the District double the emission limit for units operated under the same common ownership from a factor of 1.2652 times the sum of the rated heat inputs of all units to a factor of 2.5304.

**DISTRICT RESPONSE**

The District disagrees. The District understands the concerns regarding grid reliability on days with high electrical demand. However, the proposed rule contains ample provisions in Subsection (b)(5) to allow these units to operate if their operation is necessary to support the electrical grid during periods of high electricity demand.

Please also see the response to Comment No. 39.

**36. POST-WORKSHOP WRITTEN COMMENT**

We request clarification in Subsection (d)(3)(ii) that any units subject to this rule would be excluded from the aggregate NOx mass emission limit, on a year-by-year basis, if the NOx concentration from any unit's most recent annual source test is less than or equal to the applicable NOx concentration limits identified in Subsections (d)(1) or (d)(2).

**DISTRICT RESPONSE**

Please see the response to Comment No. 28.

**37. POST-WORKSHOP WRITTEN COMMENT**

Rule 69.3.1(e)(4):

*“An owner or operator of any unit subject to this rule shall maintain, as applicable for the type of unit, records of dates and times of operation, times of all startups, shutdowns, periods of operation at low load, fuel changes and records of the type and quantity of each fuel used during each calendar day and calendar year.”*

Several of our facilities have a single natural gas utility meter serving two or four combustion turbines and the facilities do not have direct control over the calibration of the gas meters, nor are the meters capable of measuring fuel consumption by each turbine.

We request that language be added to Subsection (e)(4) to allow the option of combined fuel use records for any facility using a single fuel meter for multiple units.

**DISTRICT RESPONSE**

The District agrees. The District has added a provision in Subsection (e)(10) that explicitly allows the monitoring of a group operating parameter and use of a group average emission factor to determine compliance with Subsection (d)(3) for groups of emission units for which only an operating parameter for the group as a whole is monitored. By using a group average, no new monitoring is required for individual units in the group.

**38. POST-WORKSHOP WRITTEN COMMENT**

Rule 69.3.1(d)(4):

*“If a existing gas turbine engine subject to Subsection (d)(3) is replaced or reconstructed, the replacement unit or reconstructed existing unit shall not be subject to an aggregate NOx emission limit pursuant to this rule, but shall be subject to the emission limits specified in Subsection (d)(1) on and after (date of adoption).”*

We request that the word “reconstructed” be completely removed from this subsection and a statement be added allowing normal maintenance of a turbine using specific parts without triggering the lower NOx emission limits.

**DISTRICT RESPONSE**

Please see the response to Comment No. 29.

**39. POST-WORKSHOP WRITTEN COMMENT**

Rule 69.3.1(c)(27):

*““System Emergency” means that the condition... of the electrical grid is threatened. System Emergency also includes the unscheduled loss of generation or transmission resources such that the reliability of the electrical grid is threatened. ....”*

We request the following change to clarify the source(s) of the second part of the definition:

*““System Emergency” means that the condition... of the electrical grid is threatened. System Emergency, **as defined by San Diego Gas & Electric or the CAISO**, also includes the unscheduled loss of generation or transmission resources such that the reliability of the electrical grid is threatened. ...”*

**DISTRICT RESPONSE**

Subsection (b)(5) contains a provision that allows the local serving utility (i.e., San Diego Gas & Electric) to, in effect, declare a system emergency in the event any of the units affected by Subsection (d)(3) are needed to maintain grid reliability if the utility is unable to contact CAISO.

The District would deem being “unable to contact” to include situations where the utility was physically able to contact CAISO but needed to respond before a reply from CAISO could reasonably be expected to be received. The District notes that, because the daily NOx mass emission limit is an aggregate limit over all units under common ownership, it is likely nearly all localized problems on the San Diego Gas & Electric grid can be dealt with within the aggregate NOx mass emission limit.

**40. POST-WORKSHOP WRITTEN COMMENT**

Rule 69.3.1(e)(10):

*“The owner or operator of any unit or units subject to Subsection (d)(3) shall maintain records of NOx emissions that occur during that calendar day for each such unit and aggregate NOx emissions for all such units combined under the same common ownership. The NOx emissions shall be based on each unit's most recent source test results and calculated in accordance with a protocol approved in writing by the Air Pollution Control Officer.”*

We request the following changes to clarify which NOx emissions shall be maintained in records at the facility to comply with this requirement:

*“The owner or operator of any unit or units subject to Subsection (d)(3) shall maintain records of NOx mass emissions that occur during that calendar day for each such unit and aggregate NOx mass emissions for all such units combined under the same common ownership. The NOx mass emissions shall be based on each unit's most recent source test results and calculated in accordance with a protocol approved in writing by the Air Pollution Control Officer.”*

**DISTRICT RESPONSE**

Please see the response to Comment No. 31.

**41. POST-WORKSHOP WRITTEN COMMENT**

Rule 69.3.1(d)(3) and (e)(11):

*“Notwithstanding Subsection (d)(2), on or after January 1, 2011, a person shall not operate a peaking unit with a power rating greater than or equal to 4 megawatts that was installed on or before December 16, 1998, and that does not comply with the emissions concentration limits specified in Subsection (d)(1), unless the Air Pollution Control Officer has determined that an exceedance of the federal eight-hour ambient air quality standard for ozone is not predicted at any location in the air basin at any time during the calendar day on which the gas turbine operates, or...”*

And

*“For peaking units subject to Subsection (d)(3), the owner or operator shall maintain records that indicate if a day on which the peaking unit operates is a day that the Air Pollution Control Officer had predicted an exceedance of the federal eight-hour ozone standard and, if an exceedance of the federal eight-hour ozone standard was predicted, if a System Emergency as specified in Subsection (b)(5) was declared.”*

Both subsections, (d)(3) and (e)(11), contain requirements that are contingent upon forecasts relative to the federal 8-hour ozone standard issued by the APCO. However, in the pre-workshop draft of Rule 69.3.1 dated 8/3/07, it references forecasts relative to the state 1-hour ozone standard. Annual counts of the number of days each standard was exceeded during the past 10 years were obtained from the California Air Resources Board web site. On average, ambient air monitoring sites within the San Diego Air Basin exceeded the state 1-hr standard (0.09 ppm) on 20.9 days per year and the federal 8-hour standard (lowered in 2008 from the original level of 0.084 ppm to the new level of 0.075 ppm) on 34.9 days per day. The change in the ozone standard incorporated into Rule 69.3.1 from the state 1-hour standard to the federal 8-hour standard nearly doubles the number of days on which facilities may not be allowed to operate. Interestingly, the SDAPCD web site has federal 8-hour exceedance counts for the past five years based on the original standard threshold of 0.084 ppm and they average only 9 days per year. It is our impression that the District wrote the rule with the 9 days in mind, but without considering how many exceedance days will likely occur under the new 8-hour standard threshold.

We understand that the APCO only issues forecasts based on the federal 8-hour ozone standard, making the use of any other ozone standard in this rule difficult. We also understand that the APCO may not forecast ozone exceedances on every day when they are observed and that exceedances may occur on days when they are not forecast, but assuming perfect forecast accuracy by the APCO, facilities may not be able to operate for as many as 30 – 40 days during the peak electricity demand season, based on use of the new, lower federal 8-hour standard.

### **DISTRICT RESPONSE**

The District’s intent in proposing the daily NO<sub>x</sub> mass emission limit is to limit emissions on days when the District may experience high ozone levels. The District considers the 8-hour federal standard an appropriate metric to trigger the cap because the District is close to attainment and small emissions decreases may have a large effect on the District’s attainment status. The District also views attainment of this standard as very important not only for air quality but because failure to attain will impose additional regulatory burdens on local industry. In addition, this is the current ozone ambient air quality standard for which the District forecasts exceedances. Therefore, the District chose this as the reference standard for the daily mass emission limit in Subsection (d)(3).

The District thoroughly analyzed the impact using the new federal 8-hour standard of 0.075 ppm on the operations of the affected facilities. Since the rule does not prohibit operation on days when an ozone exceedance is forecast, there are no days on which the affected facilities can not operate. For the thirteen primarily gas-fueled units subject to Subsection (d)(3), the District estimates that about twelve hours of operation per turbine are possible under the intermediate

limit and about eight hours per turbine under the more stringent final limit. This assumes all the turbines are operating. If fewer turbines are operating, more operational time would be available because the limit is based on the aggregate emissions from all units under common ownership and all the primarily gas-fueled turbines are under common ownership.

Based on operating records, the District found that one or more of the thirteen primarily gas-fueled units subject to Subsection (d)(3) operated an average of 84 days per year on average in the 2002–2007 time period. Each turbine operated an average of about 3.5 hours on those days that it operated. During that period, the average number of days of operation on ozone exceedance days was seven. This indicates the proposed NO<sub>x</sub> emission limit would only have a potential impact on operations less than 10% of the time and potentially impact operations on only seven days per year on average during the summertime high electrical demand period.

The District further analyzed the potential impacts on those days when the daily NO<sub>x</sub> emission limit would have applied and, hence, possibly curtailed (but not completely prevented) operations. Based on the operating records, the District estimates curtailment days will average about two per year for the thirteen gas-fueled units with the average curtailment time being about two hours per turbine per event under the final limit. The District also estimates that the potential emission reductions resulting from the curtailments average about 1,100 pounds per day with a maximum reduction of about 3,300 pounds per day.

It is likely that the operations of the one turbine that is liquid-fueled and potentially subject to Subsection (d)(3) will be minimally impacted by the proposed rule amendments, if it is impacted at all. Source test records indicate it can likely comply with the standards of Subsection (d)(1). Therefore, it likely would not be subject to Subsection (d)(3).

Please also see the response to Comment Nos. 7 and 28.

#### **42. POST-WORKSHOP WRITTEN COMMENT**

Other issues related to the forecasts are their release time and the hours of the day for which the forecasts apply. According to the SDAPCD web site, forecasts for the next day are issued at 4:30 p.m., except on weekends, when the forecasts for Saturday, Sunday, and Monday are all issued on the preceding Friday afternoon. It is also our understanding that the forecasts apply to full, 24-hour days, despite ozone concentrations only being high in the afternoon/evenings. This means that facilities which must shutdown on forecasted high ozone days would need to shut down for the entire day, from 12:00 a.m. through 11:59 p.m. For Sunday and Monday, the facilities will likely have sufficient lead-time to accommodate the possibility of having to shut down. However, during the week, the facilities will only have about 7 hours to adjust operations to a midnight shutdown.

Additionally, we request that the ozone forecasts be released earlier in the day or that the SDAPCD issue the forecasts more than one day in advance to allow the facilities sufficient time to adjust to exceedance forecasts. Air quality forecasts for most major metropolitan areas in California are issued between 11:00 a.m. and 1:00 p.m., and many agencies issue multi-day forecasts, updated each day, to allow people adequate time to plan for high pollution days. The

APCO should have access to the same meteorological and air quality information used by the other agencies to issue forecasts, allowing the APCO to move the forecast time up by several hours and extend the forecasts out multiple days.

### **DISTRICT RESPONSE**

The District disagrees. Because units subject to Subsection (d)(3) are now proposed to be subject to an aggregate NOx mass emission limit rather than a prohibition of operation, operators of the units would not have to contemplate a midnight shutdown if an ozone exceedance were forecast at 5:00 P.M. on the day before. At worst, the units would not have to be shutdown until about 8:00 A.M. the next morning based on an estimated operating time of eight hours under the final limit. This is only in the unlikely event the units are actually operating in the evening or overnight. Units subject to Subsection (d)(3) are peaking units that operate during periods of high electrical demand for a few hours per day. High electrical demand typically does not occur in the late evening or during the night. The units typically do not begin operating before 7:00 A.M. and cease operating by 10 P.M. If all the gas-fueled units that are subject to Subsection (d)(3) began operating at 7:00 A.M., they could continue to operate until at least 3:00 P.M. under the NOx mass emission limit if an ozone exceedance had been forecast for that day. If operations were to occur overnight, it would likely be in a situation that the operation was required by CAISO because of an electrical emergency and the Subsection (d)(3) mass emission limit would not apply.

The District issues its next day ozone forecast between 4:00 and 5:00 P.M. on weekdays in order to base the forecast on the timeliest meteorological data possible to ensure the most accurate forecast possible. As discussed above, the District finds this provides enough notice for the affected facilities.

Please also see the response to Comment Nos. 7 and 41.

### **43. POST-WORKSHOP WRITTEN COMMENT**

Please do not allow Palomar Energy to push through a rule change that would allow them to have permission to pollute more than was planned. This is not fair to the citizens who breathe the air in Escondido.

### **DISTRICT RESPONSE**

As the commenter notes, one of the facilities affected by the proposed increase in the time allowed for a startup for combined-cycle turbines under certain circumstances (cold start) and limited exemptions for low-load operations is the Palomar Energy Center with two large gas turbines and an associated steam turbine. The District acknowledges that a direct affect of the proposed rule revisions, is to allow a small increase in NOx emissions from the Palomar Energy Center during the 1–3 times per year that a cold start occurs. However, because the annual NOx emissions from this facility are limited by permit conditions, which are not being changed, there will be no change in potential annual emissions upon which the permit evaluation for this facility was based.

Because it was a facility that was known to be affected by the proposed rule change, the District conducted a comprehensive and thorough evaluation of the potential impacts from the proposed rule changes, including the increased time for cold starts, for that facility.

Additionally, to reduce these emissions, the District worked with this facility to reduce the emission impacts from an extended startup as much as feasible. This resulted in new requirements the facility agreed to comply with, which are now conditions of its permit to operate, and new operational controls installed by the facility. These new requirements and operational controls are:

- Prohibition of both turbines being in startup mode at the same time, except during emergency situations, to reduce the maximum hourly emission impacts. This requirement allows the second turbine to startup in a cold start to comply with the rule NOx standards within the 120 minutes currently allowed by the rule. This effectively reduces excess NOx emissions by a factor of two.
- A requirement that the selective catalytic reduction system become fully operational earlier in the startup.
- Installation and use of new turbine operational control software the uses sophisticated combustor tuning to reduce emissions during low-load operations such as a startup.

After implementation of these items, based on facility CEMS data during a cold start, the District estimates that a worst-case 360-minute startup period would result in estimated potential excess NOx emissions of 235 pounds per startup event over the existing rule. Based on the same CEMS data, actual excess emissions are estimated to be about 100 pounds per event. To put 235 pounds of NOx emissions into perspective, this equates to less than one-tenth of one percent of total daily NOx emissions in the region (estimated to be 160 tons or 320,000 pounds of NOx emissions per day in San Diego County). The District also notes that cold starts tend to happen outside the May–November ozone season.

Furthermore, the District evaluated the impact of excess NOx emitted during a cold start with respect to the ambient air quality standards for nitrogen dioxide (NO<sub>2</sub>) in the area surrounding the power plant using the most recent EPA recommended pollutant dispersion model and updated meteorological data. The District found that the impact of the NOx emissions from extended startups when added to the monitored background levels of NO<sub>2</sub> in Escondido did not cause any exceedance of the 1-hour or annual ambient air quality standards for NO<sub>2</sub>. The ambient air quality standards are established to be health protective with an adequate margin of safety both for the general population and groups of sensitive individuals (for example, children and asthmatics).

Although the proposed rule change only explicitly allows additional NOx emissions during an extended startup, the District also evaluated the potential impacts of the other criteria pollutants (criteria pollutants have an associated ambient air quality standard) carbon monoxide (CO), oxides of sulfur (SOx), particulate matter less than or equal to 10 microns in diameter (PM<sub>10</sub>),

particulate matter less than or equal to 2.5 microns in diameter (PM<sub>2.5</sub>) and toxic air contaminants. The District performed this evaluation because emissions of some pollutants, CO and some toxic air contaminants, are elevated during startup and the exhaust velocity of the stack and exhaust temperature are less favorable for the dispersion of pollutants than during normal operations. As part of this evaluation, the District conducted a source test of the Palomar Energy Center during the first hour of a cold start to quantify emissions of toxic air contaminants and other pollutants under cold start conditions. To the District's knowledge, no other such source test had been conducted on a large combined-cycle turbine up to that time.

As with NO<sub>x</sub>, for the other criteria pollutants, the District did not find any significant impacts on the applicable ambient air quality standards when the impacts were added to the background pollutant levels for Escondido.

In addition, the impacts of toxic air contaminants were below District standards for significance as specified in Rule 1200, Toxic Air Contaminants—New Source Review. Specifically, the incremental lifetime cancer risk from the extended startup was less than one in a million, well below the standard of ten in a million that would be applicable to the Palomar Energy Center. For non-cancer acute (one hour), chronic (annual), or 8-hour impacts from toxic air contaminants, the health hazard indexes (HHI) were also all well below the less than the Rule 1200 standard of one.

To further assure that the rule change would not allow operation of a facility that would jeopardize public health. The District conducted the same type of evaluation as was done for the excess emissions allowed by the rule changes including all the facility's potential emissions from the gas turbines not just the excess emissions from the rule change. Compared to the original permit evaluation, this allowed the use of the most recent EPA recommended pollutant dispersion model, updated meteorological data, and the information on pollutant emissions during startups at the facility that the District had collected since the permit evaluation. This evaluation also showed no significant impacts relative to applicable ambient air quality standards for criteria pollutants when the impacts were added to the background pollutant levels for Escondido nor did it show any significant health impacts based on the criteria of Rule 1200.

Therefore, the District concluded that there are no significant health impacts from the excess criteria or toxic air contaminant emissions allowed by the proposed rule change.

#### **44. POST-WORKSHOP WRITTEN COMMENT**

Please define the term "low load". The term "low load" is used at (b)(3)(iii) and (e)(4).

#### **DISTRICT RESPONSE**

The term "period of operation at low load" is defined at Subsection (c)(18).



**45. POST-WORKSHOP WRITTEN COMMENT**

On days when the APCO does NOT make an ozone prediction available by 5:30 P.M. for the next day, may the source assume that the limits imposed in (d)(1) do not apply for that source for the next day

**DISTRICT RESPONSE**

The District assumes the commenter is referring the daily aggregate NOx mass emission limits in Subsection (d)(3). In accordance with revised Subsection (d)(4), a forecast ozone exceedance for the next day is considered not to have been made if the District does not make the forecast publicly available by 5:30 P.M. In this case, the daily NOx emission limits of Subsection (d)(3) do not apply because no forecast ozone exceedance has been made for purposes of the rule. However, the NOx exhaust concentration emission standards of Subsection (d)(2) would still apply to all peaking turbines that would have been subject Subsection (d)(3) had a forecast been made in a timely manner.

SBM:jlm  
12/24/09

# DRAFT

## PROPOSED AMENDED RULE 69.3.1

Proposed amended Rule 69.3.1 to read as follows:

### **RULE 69.3.1. STATIONARY GAS TURBINE ENGINES - BEST AVAILABLE RETROFIT CONTROL TECHNOLOGY**

(Adopted and Effective 12/16/98; Rev. Effective (date of adoption))

#### **(a) APPLICABILITY**

Except as provided in Subsection (b)(1), This rule shall apply to any existing stationary gas turbine engine with a power rating of 1.0 megawatt (MW) or greater, or to any new stationary gas turbine engine with a power rating of 0.3 MW or greater. Any unit subject to Section (d) of this rule shall not be subject to Rule 68.

#### **(b) EXEMPTIONS**

(1) The provisions of this rule shall not apply to the following:

(i) Any gas turbine engine when operated exclusively for the research, development or testing of gas turbine engines or their components.

(ii) Any portable gas turbine engine. It is the responsibility of any person claiming this exemption to maintain records indicating the dates that such gas turbine engine was located at each stationary source. These records shall be maintained for a minimum of two calendar years by the owner or operator of such gas turbine engine and made available to the District upon request.

(iii) Any stationary gas turbine engine with a power rating less than or equal to 0.4 MW used in conjunction with military tactical support equipment operated at military sites, provided that operations do not exceed 1,000 hours per calendar year. It is the responsibility of any person claiming this exemption to maintain records indicating the hours that such gas turbine engine was operated. These records shall be maintained for a minimum of two calendar years by the owner or operator of such gas turbine engine and made available to the District upon request.

(2) The provisions of Section (d) shall not apply to ~~the following:~~ (i) Any emergency unit provided that operation for non-emergency purposes to ensure operability in the event of an emergency situation does not exceed 80 hours per calendar year. It is the responsibility of any person claiming this exemption to maintain records in accordance with Subsections (e)(5) and (e)(8) of this rule.

- (3) The provisions of Subsections (d)(1) and (d)(2) shall not apply to the following:
- (i) Any unit during startup, shutdown or a fuel change for a period not to exceed 120 ~~continuous~~ consecutive minutes except as provided for in Subsection (b) (34). ~~It is the responsibility of any person claiming this exemption to maintain records in accordance with Subsections (e)(4) and (e)(8) of this rule.~~ Nothing in this rule shall be construed to limit the actual time needed to conduct a startup, shutdown or fuel change.
  - (ii) For turbines equipped with ~~dry low oxides of nitrogen (NOx)~~ lean premix combustors, periods of operation at low load provided that:
    - (A) The aggregate time of such periods does not exceed 130 minutes in any calendar day,
    - (B) The aggregate of all such periods does not exceed 780 minutes in any calendar year, and
    - (C) The turbine is equipped with a continuous emission monitoring system (CEMS) or other monitoring system that monitors and records turbine fuel flow and gross electrical output in increments of one minute or less.
- ~~(3)(4)~~ The provisions of ~~Section~~ Subsections (d)(1) and (d)(2) shall not apply to any combined-cycle gas turbine engine during an extended startup for a period not to exceed 360 consecutive minutes.
- (5) The provisions of Subsection (d)(3) shall not apply on any calendar day for which the California Independent System Operator (CAISO), or its successor has declared a System Emergency or on any calendar day during which the local serving utility's transmission operations department is unable to contact the CAISO and has declared the need for operation of one or more emission units to protect transmission system reliability.

(6) The provisions of Subsection (d)(3)(i) and (d)(3)(ii) shall not apply when burning liquid fuel is required due to a force majeure natural gas curtailment.

**(c) DEFINITIONS**

For the purposes of this rule, the following definitions shall apply:

(1) **"Best Available Retrofit Control Technology (BARCT)"** means an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy and economic impacts by each class or category of source.

(2) **"Combined-Cycle Gas Turbine Engine"** means any stationary gas turbine engine which recovers heat from the gas turbine exhaust gases to generate steam that is used to create additional power output in a steam turbine.

~~(3) "Dry Low NOx Combustor" means any turbine combustor design which uses multiple staging, air/fuel premixing, or other modifications, in order to reduce NOx emissions to lower levels as compared to a conventional combustor.~~

~~(4) "Electrical Grid Emergency" means that the condition of the electrical grid as determined by the California Independent System Operator or a successor agency is, or will be, such that the reliability of the electrical grid is threatened. Electrical emergencies include, but are not limited to, Stage 1, Stage 2, or Stage 3 Emergency Notices; Transmission Emergency Notices; or System Emergencies declared by the California Independent System Operator that are applicable to San Diego County or the State as a whole. Restricted maintenance operation notices to facilities, power watches urging consumers to conserve electricity, alerts advising of marginal conditions the next day, and warnings advising of marginal conditions the next hour issued by the California Independent System Operator are not by themselves considered electrical emergencies.~~

~~(2)(5)(3)~~ **"Emergency Situation"** means any one of the following:

(i) ~~a~~An unforeseen electrical power failure of the serving utility or of onsite electrical transmission equipment that is demonstrated by the owner or operator to the Air Pollution Control Officer's satisfaction to have been beyond the reasonable control of the owner or operator; or

(ii) ~~a~~An unforeseen flood, or fire, or life-threatening situation.

(iii) A life-threatening situation.

Emergency situation shall not include operation of any unit for training purposes or other foreseeable event, or operation of any peaking unit for the purpose of supplying power for distribution to an electrical grid.

~~(3)(6)(4)~~ **"Emergency Unit"** means a stationary gas turbine engine used only in the event of an emergency situation. A peaking unit shall not be considered an emergency unit.

~~(4)(75)~~ **"Existing" or "Existing Unit"** means any stationary gas turbine engine which was installed and operating in San Diego County on or before December 16, 1998.

~~(86)~~ **"Extended startup"** means the startup of a combined-cycle gas turbine engine when, as determined by the Air Pollution Control Officer, key operational parameters, such as the steam turbine reheat bowl temperature, indicate that more than 120 consecutive minutes are needed to meet the emission limits of Section (d).

~~(7)~~ **"Force Majeure Natural Gas Curtailment"** means an interruption in natural gas service such that the daily fuel needs of a gas turbine engine subject to this rule cannot be met with the natural gas available due to:

(i) Unforeseeable natural disaster or other cause resulting in the failure or malfunction of natural gas supply, delivery or storage system facilities, not resulting from an intentional or negligent act or omission on the part of an owner or operator of a unit, or

(ii) A supply restriction resulting from a California Public Utilities Commission priority allocation ruling, or

(iii) Delivery restrictions due to pipeline capacity limitations of the natural gas supplier or upstream transports or within a gas utility's delivery system.

~~(5)(98)~~ **"Fuel Change"** means the transitory operating period when a switch occurs between liquid or gaseous fuels, or any combination thereof.

~~(6)~~~~(109)~~ **"Gaseous Fuel"** means natural gas, digester gas, landfill gas, methane, ethane, propane, butane, or any gas stored as a liquid at high pressure such as liquefied petroleum gas.

~~(7)~~~~(10)~~ **"Higher Heating Value (HHV)"** means the total heat liberated, including the heat of condensation of water, per mass of fuel burned (Btu per pound) when fuel and dry air at standard conditions undergo complete combustion and all resultant products are brought to standard conditions.

(11) **"Lean Premix Combustor"** means any turbine combustor design where the air and majority of the fuel are thoroughly mixed to form a lean mixture before combustion under normal operational conditions, as determined by the Air Pollution Control Officer. Mixing may occur before or in the combustion chamber. A lean premix combustor may operate in a non-lean-premix mode (diffusion flame mode) during operating conditions such as startup and shutdown, extreme ambient temperature, or low or transient load.

~~(8)~~~~(12)~~ **"Liquid Fuel"** means any fuel which is a liquid at standard conditions including but not limited to distillate oils, kerosene and jet fuel. Liquefied gaseous fuels are not liquid fuels.

~~(9)~~~~(13)~~ **"Lower Heating Value (LHV)"** means the total heat liberated, excluding the heat of condensation of water, per mass of fuel burned (Btu per pound) when fuel and dry air at standard conditions undergo complete combustion and all resultant products are brought to standard conditions.

~~(10)~~~~(14)~~ **"Manufacturer's Rated Thermal Efficiency (MRTE)"** means the manufacturer's continuous rated percent thermal efficiency of the gas turbine engine, including the effect of any equipment with air pollution control equipment if such equipment is installed, at peak load, after correction to lower heating value.

~~(11)~~~~(15)~~ **"Military Tactical Support Equipment"** means any equipment owned by the U.S. Department of Defense or the National Guard and used in combat, combat support, combat service support, tactical or relief operations, or training for such operations.

~~(12)~~~~(16)~~ **"New" or "New Unit"** means a stationary gas turbine engine installed in San Diego County after December 16, 1998.

~~(13)~~~~(17)~~ **"Peaking Unit"** means a stationary gas turbine engine that is operated intermittently for generation of electric power during periods of high energy demand.

(18) **“Period of Operation at Low Load”** means a period of time that begins when the gas turbine power level is reduced from a higher level to below a critical level, as determined by the Air Pollution Control Officer, such that the gas turbine is unable to comply with the standards of Section (d), and ends 10 minutes after the turbine power level next exceeds the critical level provided that fuel is continuously combusted during the entire period. No period of operation at low load shall begin during a period when the provisions of Section (d) do not apply pursuant to Subsection (b)(~~23~~)(i), or Subsection (b)(~~34~~).

~~(14)~~(19) **"Portable Gas Turbine Engine"** means a gas turbine engine which meets the definition of a portable emission unit in Rule 20.1.

~~(15)~~(20) **"Power Augmentation"** means an increase in the gas turbine engine shaft output, or a decrease in turbine fuel consumption, by the addition of energy recovered from exhaust heat.

~~(16)~~(21) **"Power Rating"** means the maximum, continuous, gross power output of a unit, in megawatts (MW) or equivalent at ISO standard day conditions, as certified by the manufacturer unless limited by a condition in a District Authority to Construct or a Permit to Operate. Power augmentation shall not be included in power rating.

~~(17)~~(22) **“Selective Catalytic Reduction (SCR)”** means a post-combustion control technology that utilizes a reducing agent, such as ammonia, injected into the exhaust gas stream where it converts ~~oxides of nitrogen (NOx)~~ to molecular nitrogen in the presence of a catalyst.

~~(18)~~(23) **"Shutdown"** means an action necessary to cease operation of a unit and includes the amount of time needed to safely do so. For gas turbines equipped with a continuous emission monitoring system (CEMS) or other continuous monitoring system that monitors and records fuel flow in increments of one minute or less, a shutdown period ends five minutes after fuel flow to the unit ceases.

~~(19)~~(24) **"Stationary Gas Turbine Engine"** means any gas turbine engine system, with or without power augmentation, which is permanently attached to a foundation, or is not a portable gas turbine. Two or more gas turbines powering a common shaft shall be treated as one gas turbine.

~~(20)~~(25) **"Stationary Source"** means the same as defined in Rule 2.

~~(21)~~(26) **"Startup"** means an action necessary to begin operation of a unit and includes the amount of time needed for a unit and ancillary equipment to achieve stable operation. For gas turbines equipped with a CEMS or other continuous monitoring system that monitors and records fuel flow in increments of one minute or less, a startup period begins when fuel starts flowing to the gas turbine engine.

(27) **"System Emergency"** means that the condition of the electrical grid as determined by the California Independent System Operator (CAISO) or its successor agency is, or will be, such that the reliability of the electrical grid is threatened. System emergencies include, but are not limited to, Stage 1, Stage 2, or Stage 3 Emergencies or Transmission Emergency Notices issued by the CAISO that are applicable to a portion of the CAISO controlled grid that includes all or part of San Diego County or the CAISO controlled grid as a whole. System Emergency also includes the unscheduled loss of generation or transmission resources such that the reliability of the electrical grid is threatened. Restricted maintenance operation notices to facilities, power watches urging consumers to conserve electricity, alerts advising of marginal conditions the next day, and warnings advising of marginal conditions the next hour issued by the CAISO are not by themselves considered electrical emergencies.

(28) **"Under the Same Common Ownership"** means units in San Diego County that are owned or operated by the same person including all units that are owned or operated by another entity in which the person has a controlling interest.

~~(22)~~(279) **"Unit"** means any stationary gas turbine engine.

~~(23)~~(30) **"Unit Thermal Efficiency (E)"** means the percent thermal efficiency of the gas turbine engine and is calculated as follows:

$$E = \frac{(\text{MRTE}) (\text{LHV})}{(\text{HHV})}$$

A gas turbine engine with an efficiency lower than 25 percent shall be assigned a unit efficiency of 25 percent.

(d) **STANDARDS**



(1) Except as provided for in Section (b) and Subsection (d)(2), the emissions concentration in parts per million by volume (ppmv) of ~~nitrogen oxides (NOx)~~ from any unit subject to this rule, calculated as nitrogen dioxide at 15% oxygen on a dry basis, shall not exceed the following:

<u>Power Rating (Gross Megawatts)</u>	<u>NOx Emissions Concentration</u>	
	<u>(ppmv @ 15% O<sub>2</sub>)</u>	
	<u>Gaseous Fuel</u>	<u>Liquid Fuel</u>
≥0.3 and <2.9 (new units)	42	65
≥1.0 and <2.9 (existing units)	42	65
≥2.9 and <10.0	25 x E/25	65
≥10.0 without <u>installed</u> post-combustion <u>air pollution control equipment</u>	15 x E/25	42 x E/25
≥10.0 with <u>installed</u> post-combustion <u>air pollution control equipment</u>	9 x E/25	25 x E/25

(2) The emissions concentration in parts per million by volume (ppmv) of ~~nitrogen oxides (NOx)~~ from any unit subject to this rule and described below, calculated as nitrogen dioxide at 15% oxygen on a dry basis, shall not exceed the following:

<u>Unit Description</u>	<u>NOx Emissions Concentration</u>	
	<u>(ppmv @ 15% O<sub>2</sub>)</u>	
	<u>Gaseous Fuel</u>	<u>Liquid Fuel</u>
Peaking units ≥4 MW, <del>and</del> <u>and</u> operating less than 877 hours per calendar year <u>and installed on or before <del>(date of adoption)</del> December 16, 1998.</u>	42	65
Units <4 MW and operating less than 877 hours per calendar year	42	65

(3) Notwithstanding Subsection (d)(2), on or after January 1, 2012, ~~A~~ a person shall not operate a ~~gas turbine engine used to generate electricity~~ peaking unit with a power rating greater than or equal to 4 megawatts that was installed on or before December 16, 1998, and that does not comply with the emissions concentration limits specified in Subsection (d)(1), as determined by the most recent source test pursuant to Subsection (g).

as approved by the Air Pollution Control Officer, on or after July 1, 2010, on any calendar day that the Air Pollution Control Officer has predicted an exceedance of the federal eight-hour ambient air quality standard for ozone, unless the following standards are complied with:

(i) ~~The Air Pollution Control Officer has determined that an exceedance of the State one-hour ambient air quality standard for ozone is not predicted at any location in the air basin at any time during the calendar day on which the gas turbine operates;~~ or For each peaking unit permitted to operate on natural gas and liquid fuel before December 16, 1998, and not complying with Subsection (d)(1), the gas turbine engine shall operate on natural gas only.

(ii) ~~The California Independent System Operator or a successor agency has declared an electrical grid emergency during the calendar day on which the gas turbine operates.~~ For each peaking unit permitted to operate on natural gas and liquid fuel before December 16, 1998, and not complying with Subsection (d)(1), the aggregate emissions of NO<sub>x</sub> per calendar day, as expressed as nitrogen dioxide, from all such units combined that are under the same common ownership shall not exceed the following aggregate calendar-day NO<sub>x</sub> emission limits expressed in pounds, as applicable:

(A) From January 1, 2012 through December 31, 2014, the limit, expressed in pounds, shall be equal to 1.2652 multiplied by the sum of the rated heat inputs, expressed in MMBtu per hour, of all such turbines under the same common ownership.

(B) On and after January 1, 2015, the limit, expressed in pounds, shall be equal to 0.8594 multiplied by the sum of the rated hourly heat inputs, expressed in MMBtu per hour, of all such turbines under the same common ownership.

In calculating the aggregate calendar-day emission limit, the rated heat input for each unit shall be the unit's heat input as described on the applicable District Permit to Operate as it exists on (date of adoption).

(iii) For the gas turbine engine permitted to operate on liquid fuel only before December 16, 1998, and not complying with Subsection (d)(1), the aggregate emissions of NOx, as expressed as nitrogen dioxide, from all such units combined that are under the same common ownership shall not exceed the following aggregate calendar-day NOx emission limits, as applicable:

(A) From January 1, 2012, through December 31, 2014, 550 pounds during each calendar day.

(B) On and after January 1, 2015, 430 pounds during each calendar day.

(4) For purposes of Subsection (d)(3), an exceedance of the federal 8-hour ozone standard on a calendar day shall be considered to have been predicted if the Air Pollution Control Officer makes such a prediction that is applicable to any location at any time in the San Diego air basin and makes the prediction publicly available no earlier than three calendar days before the day for which the prediction is made and no later than 5:30 PM of the day immediately preceding the day for which the prediction is made.

**(e) MONITORING AND RECORDKEEPING REQUIREMENTS**

(1) An owner or operator of a unit which is subject to the requirements of Section (d) shall install, calibrate and maintain continuous monitors in accordance with the manufacturer's recommended procedures to monitor and record the operational characteristics of the unit and of any NOx emissions reduction system, as applicable, to demonstrate continuous compliance, such as:

- (i) ~~exhaust gas~~fuel flow rate;
- (ii) exhaust gas temperature;

- (iii) ammonia injection rate;
- (iv) water injection rate; ~~and~~
- (v) stack-gas oxygen content;
- (vi) inlet or outlet SCR catalyst temperature; and
- (vii) operational parameters defining an extended startup.

The Air Pollution Control Officer may require recording of one or more of the above parameters, or other parameters, as necessary to ensure compliance.

(2) An owner or operator of any unit with a power rating of 10 MW or more that operates more than 4,000 hours per calendar year shall install and operate a ~~continuous emission monitoring system (CEMS)~~ to measure and record NOx emissions. The CEMS shall be certified, calibrated and maintained in accordance with all applicable federal regulations including, but not limited to, the requirements of Sections 60.7(c), 60.7(d), and 60.13 of Title 40, Code of Federal Regulations, Part 60 (40 CFR Part 60), performance specifications of Appendix B of 40 CFR Part 60, quality assurance procedures of Appendix F of 40 CFR Part 60, Sections 75.10 and 75.12 of 40 CFR Part 75, the specifications and test procedures of Appendix A of 40 CFR Part 75, the quality assurance and quality control procedures of Appendix B of 40 CFR Part 75, and a protocol approved in writing by the Air Pollution Control Officer.

(3) An owner or operator of any unit with a ~~continuous emission monitoring system~~ CEMS which has been installed to ~~measure~~ monitor and record NOx emissions pursuant to any federal regulation shall certify, calibrate and maintain the CEMS in accordance with applicable federal regulations including the requirements of Sections 60.7(c), 60.7(d), and 60.13 of Title 40, Code of Federal Regulations Part 60 (40 CFR Part 60), performance specifications of Appendix B of 40 CFR Part 60, quality assurance procedures of Appendix F of 40 CFR Part 60, and a protocol approved in writing by the Air Pollution Control Officer.

(4) An owner or operator of any unit subject to this rule shall maintain, as applicable for the type of unit, an operating log and records of dates and times of operation, actual times and duration of all startups, shutdowns, periods of operation at low load, and fuel changes; and records of the type and quantity of each fuel used during each calendar day and calendar year.

(5) An owner or operator of an emergency unit shall maintain ~~an operating log and records of dates and times of operation, including the hours of operation~~ operating hours for non-emergency purposes and during each emergency situation. At a minimum, these records shall include the dates and ~~actual times and duration~~ of all startups and shutdowns, total cumulative ~~annual~~ hours of operation for non-emergency purposes during each calendar year, and a description of each emergency situation.

(6) An owner or operator of a peaking unit shall maintain ~~an operating log and records of dates and times of operation, the hours of operation~~ each calendar day ~~during periods of high energy demand~~, and the total cumulative hours of operation during each calendar year. ~~The records of dates of operation shall also indicate if the peaking unit operated during a non-exceedance day of the State one-hour ozone standard or day declared an electrical grid emergency pursuant to Subsection (d)(3)(i) or Subsection (d)(3)(ii).~~

(7) An owner or operator of any unit ~~with a power rating less than 4 MW and~~ operating less than 877 hours per calendar year and subject to Subsection (d)(2) shall ~~maintain an operating log and~~ records of the total cumulative hours of operation during each calendar year.

(8) An owner or operator of any unit subject to this rule shall maintain all records required by Section (e) and records of all source tests required by Subsection (g)(2) or Subsection (g)(3) for a minimum of two calendar years. These records shall be maintained on the premises and made available to the District upon request. Records for facilities that are unmanned may be kept at an alternative location approved in writing by the Air Pollution Control Officer.

(9) An owner or operator of any peaking unit subject to Subsection (d)(2) or emergency unit subject to Subsection (b)(2)(4) shall install and maintain a non-resettable meter that measures elapsed operating time if deemed necessary by the Air Pollution Control Officer.

(10) The owner or operator of any unit or units subject to Subsection (d)(3) shall maintain following records:

(i) Records of calendar-day aggregate NOx mass emissions for all such units combined under the same common ownership;

(ii) For each unit, calendar-day records of the applicable operational parameter(s) that are used to calculate the aggregate NOx mass emissions for that unit in accordance with the .

The recorded calendar-day NOx mass emissions shall be based on each individual unit's most recent source test results and a suitable operational parameter(s) and calculated in accordance with a protocol approved in writing by the Air Pollution Control Officer. Any such protocol shall rely on existing recordkeeping and monitoring to the extent feasible and may provide for calculation of NOx mass emissions for a group of emission units based on an average emission factor for the group units and an operational parameter(s) applicable to the group as a whole in order to minimize additional monitoring or recordkeeping.

In lieu of calculating and recording aggregate NOx mass emissions for each calendar day pursuant to Subsection (e)(10)(i), the owner or operator may, with the advanced written approval of the Air Pollution Control Officer, maintain records of a suitable surrogate parameter for aggregate NOx mass emissions on some or all calendar days provided that the Air Pollution Control Officer determines that the surrogate parameter is adequate to determine compliance with Subsection (d)(3). In this event, the final determination of compliance for a calendar day shall be based on mass emissions calculated pursuant to the approved protocol and the records maintained pursuant to Subsection (e)(10)(ii).

(11) For peaking units subject to Subsection (d)(3), the owner or operator shall maintain records that indicate if a day on which the peaking unit operates is a day that the Air Pollution Control Officer had predicted an exceedance of the federal eight-hour ozone standard and, if an exceedance of the federal eight-hour ozone standard was predicted, if a System Emergency as specified in Subsection (b)(5) was declared.

(12) An owner or operator of any unit subject to Subsection (d)(3)(i) shall maintain records of dates and times liquid fuel is used as a result of a force majeure natural gas curtailment.

**(f) TEST METHODS**

(1) To determine compliance with Section (d), measurement of ~~oxides of nitrogen~~ NO<sub>x</sub> and stack-gas oxygen content shall be conducted in accordance with the U.S. Environmental Protection Agency (EPA) Method 7E and 3A, or District Source Test Method 100, or the Air Resources Board (ARB) Test Method 100 as approved by the EPA ~~U.S. Environmental Protection Agency (EPA).~~

(2) The higher heating value and lower heating value of a fuel shall be determined by the following methods or their most current versions and can be provided by a fuel supplier:

(i) ASTM Test Method D240-920209 or D2382-884809-0609 for liquid fuels, and

(ii) ASTM Test Method D1826-94(2003), or D1945-9603, in conjunction with ASTM Test Method D3588-948(2003) for gaseous fuels.

**(g) SOURCE TEST REQUIREMENTS AND COMPLIANCE DETERMINATION**

(1) Any required source testing shall be performed at no less than 80% of the power rating. If an owner or operator of a gas turbine engine demonstrates to the satisfaction of the Air Pollution Control Officer that the turbine cannot operate at these conditions, then emissions source testing shall be performed at the highest achievable continuous power rating.

(2) Except as specified in Subsection (g)(3), a A-unit subject to the requirements of Section (d) shall be tested for compliance at least once annually in the ~~12~~twelve-calendar-

month period before ending on the last day of the Permit to Operate-renewal expiration month-date, unless otherwise more frequent testing is specified in writing by the Air Pollution Control Officer. ~~Testing shall be conducted in accordance with Section (f) and a source test protocol approved in writing by the Air Pollution Control Officer.~~

(3) Unless more frequent testing is specified in writing by the Air Pollution Control Officer, a unit equipped with a continuous emission monitoring system (CEMS), subject to the requirements of Section (d), and subject to the provisions of the federal Acid Rain Program, Title 40, Code of Federal Regulations, pursuant to Section 72.6 of 40 CFR Part 72, shall be tested for compliance at a frequency in accordance with 40 CFR Part 75 Appendix B Section 2.3.1 and Section 2.3.3.

(4) All testing shall be conducted in accordance with the requirements of Section (f) and a source test protocol approved in writing by the Air Pollution Control Officer.

~~(3)~~(5) Test reports shall include the operational characteristics, as described in Subsection (e)(1), of the unit and of all add-on NOx control systems.

~~(4)~~(6) For the purposes of a compliance determination based on source testing, the NOx emissions concentration shall be calculated as an average of three subtests.

~~(5)~~(7) For the purposes of a compliance determination based on CEMS data, the averaging period to calculate NOx emissions concentration shall be one clock hour. For the purposes of compliance determination, the clock hour average NOx emissions concentration shall not include the data during periods of startup, shutdown, fuel change, and operation at low load.

(8) Notwithstanding provisions of this Section (g), the Air Pollution Control Officer may require source testing to determine compliance with these Rules and Regulations or to determine emissions at any time.

#### **(h) COMPLIANCE SCHEDULE**

~~(3)~~(1) An owner or operator of a new or replacement unit shall comply with all applicable provisions of this rule upon initial installation and commencement of operation.



~~(1) An owner or operator of an existing unit requiring modification, replacement or installation of air pollution control equipment pursuant to Section (d) requirements shall meet the following increments of progress:~~

~~(i) By December 16, 1999 submit an application to the Air Pollution Control Officer for an Authority to Construct and Permit to Operate the modified or replacement air pollution control equipment necessary to meet the emission standards of Section (d) of this rule.~~

~~(ii) By December 16, 2000 demonstrate compliance with the emission standards specified in Section (d) and all other applicable provisions of this rule.~~

~~(2) By June 16, 1999 an owner or operator of an existing unit not requiring modification, replacement or installation of additional air pollution control equipment pursuant to Section (d) shall submit an application to modify conditions on the Permit to Operate as necessary to comply with the applicable requirements of Sections (d) and (e).~~