

DOCKETED

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CALIFORNIA ENERGY COMMISSION

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**STATE OF CALIFORNIA
 ENERGY RESOURCES CONSERVATION
 AND DEVELOPMENT COMMISSION**

In the Matter of:)	
EL SEGUNDO ENERGY CENTER)	Docket No. 00-AFC-14C
)	Order No. 15-0114-2
NRG ENERGY, INC.)	ORDER APPROVING a Petition to Modify the Air Quality Conditions of Certification to Define/Clarify Turbine Startup/Restarts and Other Administrative Changes

On October 3, 2014, NRG Energy (NRG), the owner of the El Segundo Energy Center, submitted a petition requesting modification of its Unit 5 & 7 air quality conditions of certification to define and clarify turbine start up/restart requirements and to make additional administrative changes to commissioning, initial operation and initial testing.

STAFF RECOMMENDATION

Energy Commission staff reviewed the petition and finds that it complies with the requirements of Title 20, Section 1769(a) of the California Code of Regulations and recommends approval of NRG's petition to modify the El Segundo Energy Center's air quality conditions of certification.

ENERGY COMMISSION FINDINGS

Based on staff's analysis, the Energy Commission concludes that the proposed changes will not result in any significant impact to public health and safety, or the environment. The Energy Commission finds that:

- The petition meets the filing criteria of Title 20, section 1769(a) of the California Code of Regulations concerning post-certification project modifications;
- The modifications will not change the findings in the Energy Commission's Final Decision pursuant to Title 20, section 1755;
- The project will remain in compliance with all applicable laws, ordinances, regulations, and standards, subject to the provisions of Public Resources Code section 25525;
- There has been a substantial change in circumstances since the Energy Commission's certification, which justify the change since turbine start up/restart requirements were not previously defined, and such clarification ensures that the

El Segundo Energy Center continues to operate in compliance with its air quality conditions of certification.

CONCLUSION AND ORDER

The California Energy Commission hereby adopts Staff's recommendations and approves the following changes to the Commission Decision for the El Segundo Energy Center's Air Quality Conditions of Certification.

CONDITIONS OF CERTIFICATION

New language is shown as **bold and underlined**, and deleted language is shown in ~~strikeout~~.

Air Quality

AQ-5 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutants to be Tested	Test Method	Averaging Time	Test Location
NH3 Emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of SCR serving this equipment

The test shall be conducted and the results submitted to the District within 45 days after the test date. The District shall be notified of the date and time of the test at least 7 days prior to the test.

The test shall be conducted ~~at least quarterly during the first twelve months of operation and at least annually thereafter.~~ The NOx concentration, as determined by the CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable, a test shall be conducted to determine the NOx emissions using District Method 100.1 measured over a 60 minute averaging time period.

The test shall be conducted to demonstrate compliance with the Rule 1303 **BACT** concentration limit.

If the equipment is not operated in any given quarter, the operator may elect to defer the required testing to a quarter in which the equipment is operated.

For the purpose of this condition, alternative test methods may be allowed for each of the above pollutants upon concurrence of the District, EPA and CPM.

Verification: The project owner shall submit the proposed protocol for the source tests no later than 45 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 10 days prior to the proposed source test date and time. The project owner shall submit

source test results no later than 60 days following the source test date to both the District and CPM.

AQ-6 [Deleted]

The operator shall conduct source test(s) for the pollutant(s) identified below on combined-cycle turbine units 5 and 7.

Pollutants To be Tested	Required Test Method	Averaging Time	Test Location
NO _x Emissions	District Method 100.1	1 hour	Outlet of SCR serving this equipment
CO Emissions	District Method 100.1	1 hour	Outlet of SCR serving this equipment
SO _x Emissions	District Method 307.91	N/A	Fuel Sample
VOG Emissions	District Method 25.3	1 hour	Outlet of SCR serving this equipment
PM ₁₀ Emissions	District Method 5	4 hours	Outlet of SCR serving this equipment
NH ₃ Emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of SCR serving this equipment

The test shall be conducted after District and CPM approval of the source test protocol, but no later than 180 days after initial start-up. The District and CPM shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (GFH), the flue gas flow rate, and the turbine generating output in MW.

The test shall be conducted in accordance with a District and CPM approved source test protocol. The protocol shall be submitted to the District and the CPM no later than 45 days before the proposed test date and shall be approved by the District and CEC before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of District Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at maximum, average and minimum loads.

The test shall be conducted for compliance verification of the BACT VOC 2.0 ppmv limit.

For natural gas-fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining

~~a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters is done with zero gas analyzed/certified to contain less than 0.5 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA method TO-12 (with preconcentration) and temperature of canisters when extracting samples for analysis is not below 70 deg. F. The use of this alternative method for VOC compliance determination does not mean that it is more accurate than District method 25.3, nor does it mean that it may be used in lieu of District method 25.3 without prior approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines. The test results shall be reported with two significant digits.~~

~~For the purpose of this condition, alternative test methods may be allowed for each of the above pollutants upon concurrence of the District, EPA and CPM.~~

~~**Verification:** The project owner shall submit the proposed protocol for the initial source tests no later than 45 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall submit source test results no later than 60 days following the source test date to both the District and CPM. The project owner shall notify the District and CPM no later than 10 days prior to the proposed initial source test date and time.~~

AQ-7 The operator shall conduct source test(s) for the pollutant(s) identified below on combined cycle turbine units Units 5 and 7.

Pollutants to be Tested	Required Test Method(s)	Averaging Time	Test Location
SOx Emissions	AQMD Method 307-91	N/A	Fuel Sample
VOC Emissions	District Method 25.3	1 hour	Outlet of SCR serving this equipment
PM ₁₀ Emissions	District Method 5	4 hours	Outlet of SCR serving this equipment
PM_{2.5} Emissions	<u>EPA Method 201A and 202</u>	<u>District-approved averaging time</u>	<u>Outlet of SCR serving this equipment</u>

The tests shall be conducted at least once every three years for SOx, PM_{2.5} and PM₁₀⁴⁹, and annually for VOC.

The test(s) shall be conducted to determine the oxygen levels in the exhaust. In addition, the test(s) shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine generating output in megawatts (MW).

The test(s) shall be conducted in accordance with District- approved test protocol. The protocol shall be submitted to the District and the CPM no later than 45 days before the proposed test date and shall be approved by the District and the ~~GEG~~ CPM before the test commences. The test protocol shall

include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at 100 percent load.

The test(s) shall be conducted for compliance verification of the BACT VOC 2.0 ppmv limit.

For natural gas-fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters is done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA method TO-12 (with preconcentration) and temperature of canisters when extracting samples for analysis is not below 70 deg. F. The use of this alternative method for VOC compliance determination does not mean that it is more accurate than District method 25.3, nor does it mean that it may be used in lieu of District method 25.3 without prior approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines. The test results shall be reported with two significant digits.

For the purpose of this condition, alternative test methods may be allowed for each of the above pollutants upon concurrence of the District, EPA and CPM.

Verification: The project owner shall submit the proposed protocol for the source tests no later than 45 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 10 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 60 days following the source test date to both the District and CPM.

AQ-11 The operator shall limit emissions from this equipment as follows:

Contaminant	Emissions Limit
PM ₁₀ ⁴⁰	<u>Less than or equal to</u> 6,935 LBS IN ANY 1 MONTH
VOC	<u>Less than or equal to</u> 4,930 LBS IN ANY 1 MONTH
SO _x	<u>Less than or equal to</u> 1,065 LBS IN ANY 1 MONTH

The operator shall calculate the monthly emissions for VOC, PM₁₀⁴⁰ and SO_x using the equation below and the following emission factors: PM₁₀⁴⁰ 4.66 lbs/mmscf, VOC 2.93 lbs/mmscf, and SO_x 0.712 lbs/mmscf.

Monthly Emissions, lb/month = X (E. F.)

Where X = monthly fuel use, mmscf/month and E. F = emission factor indicated above.

For the purposes of this condition, the limit(s) shall be based on the emissions from each individual combined cycle gas turbine Units No. 5 and No. 7.

Verification: The project owner shall submit the monthly fuel use data and emission calculations to the CPM in the Quarterly Operation Reports (**AQ-C8**).

AQ-14 The operator shall install and maintain a CEMS to measure CO concentration in ppmv. Concentrations shall be corrected to 15 percent oxygen on a dry basis. ~~The CEMS shall be installed and operated, in accordance with an approved District Rule 218 CEMS plan application. The operator shall not install the CEMS prior to receiving initial approval from District. The CO CEMS shall be installed and operated within 90 days after the initial start-up of the gas turbines.~~ The CEMS shall be installed and operated to measure CO concentration over a 15 minute averaging time period. ~~Within two weeks of turbine start-up, the operator shall provide written notification to the District of the exact date of start-up.~~

The CEMS shall convert the actual CO concentrations to mass emission rates (lbs/hr) using the equation below and record the hourly emission rates on a continuous basis:

$$\text{CO Emission Rate (lb/hr)} = K * C_{\text{co}} * F_{\text{d}} * (20.9 / (20.9\% - \%O_2 \text{ d})) * ((Q_{\text{g}} * \text{HHV}) / 1E6),$$

Where:

K = 7.267E-8 (lb/scf)/ppm

C_{co} = ~~Hourly a~~Average of ppm based on four consecutive 15-min average CO concentrations, ppm

F_d = 8710 dscf/mmBtu natural gas

%O₂ d = Hourly average % by volume O₂, dry basis, corresponding to C_{co}

Q_g = Fuel gas usage during the hour, scf/hr

HHV = Gross high heating value of fuel, Btu/scf

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-15 The operator shall install and maintain a CEMS to measure NO_x concentration in ppmv. Concentrations shall be corrected to 15 percent oxygen on a dry basis. ~~The CEMS shall be installed and operating (for BACT purposes only) no later than 90 days after initial start-up of the turbine and shall comply with the requirements of Rule 2012. During the interim period between the initial startup and the provisional certification date of the CEMS, the operator shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3).~~

~~Within two weeks of the turbine startup date, the operator shall provide written notification to the District of the exact date of start-up.~~

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-16 The 2.0 PPM NO_x emission limit(s) shall not apply during turbine commissioning, startup and shutdown periods. ~~The commissioning period shall not exceed 415 gas turbine operating hours. Startup time periods~~ shall not exceed 60 minutes for each startup. Shutdown periods shall not exceed 60 minutes for each shutdown. The turbine shall be limited to a maximum of 200 startups per year. Written records of commissioning, start-ups and shutdowns shall be maintained and made available upon request from the District.

~~A gas turbine operating hour during the commissioning period consists of 60 operating minutes. An operating minute occurs when the gas turbine fuel flow during that minute is greater than zero.~~

For the purposes of this condition, the beginning of start-up occurs at initial fire in the combustor and the end of start-up occurs when the BACT levels are achieved. If during start-up the process is aborted and the turbine is restarted, then the start-up and restart will count as one start-up, provided the total time for the start-up does not exceed 60 minutes. The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-17 The 2.0 PPM CO emission limit(s) shall not apply during turbine commissioning, startup and shutdown periods. ~~The commissioning period shall not exceed 415 gas turbine operating hours. Startup time periods~~ shall not exceed 60 minutes for each startup. Shutdown periods shall not exceed 60 minutes for each shutdown. The turbine shall be limited to a maximum of 200 startups per year. Written records of commissioning, start-ups and shutdowns shall be maintained and made available upon request from the District.

~~A gas turbine operating hour during the commissioning period consists of 60 operating minutes. An operating minute occurs when the gas turbine fuel flow during that minute is greater than zero.~~

For the purposes of this condition, the beginning of start-up occurs at initial fire in the combustor and the end of start-up occurs when the BACT levels are achieved. If during start-up the process is aborted and the turbine is restarted, then the start-up and restart will count as one

start-up, provided the total time for the start-up does not exceed 60 minutes. The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-18 [Deleted]

~~The 16.55 LBS/MMCF NO_x emission limit(s) shall only apply during the interim reporting period during the initial turbine commissioning period to report RECLAIM emissions. The interim reporting period shall not exceed 12 months from entry into RECLAIM.~~

~~**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).~~

AQ-19 [Deleted]

~~The 8.66 LBS/MMCF NO_x emission limit(s) shall only apply during the interim reporting period after initial turbine commissioning to report RECLAIM emissions. The interim reporting period shall not exceed 12 months entry into RECLAIM.~~

~~**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).~~

AQ-20 The owner/operator shall comply at all times with the 2.0 ppm 1-hour BACT limit for NO_x, except as defined in condition **AQ-16** and with the following additional restriction on startup.

NO_x emissions shall not exceed 112 lbs total per startup per turbine. Each turbine shall be limited to 200 startups per year with each startup not to exceed 60 minutes in duration.

For the purposes of this condition, the beginning of start-up occurs at initial fire in the combustor and the end of start-up occurs when the BACT levels are achieved. If during start-up the process is aborted and the turbine is restarted, then the start-up and restart will count as one start-up, provided the total time for the start-up does not exceed 60 minutes. The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-C8**.

AQ-27 [Deleted]

~~This equipment shall not be operated unless the operator demonstrates to the District's Executive Officer that the facility holds sufficient RTCs to offset the prorated annual emissions increase for the first compliance year of operation. In addition, this equipment shall not be operated unless the operator demonstrates to the District's Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility holds sufficient RTCs in an amount equal to the annual emissions increase. The project owner shall submit all such information to the CPM for approval.~~

~~The operator shall, prior to the 1st compliance year, hold a minimum NOx Reclaim Trading Credits (RTCs) of 104,864 lbs/yr. This condition shall apply during the 1st months of operation, commencing with the initial operation of the gas turbine.~~

~~The operator shall, prior to the beginning of all years subsequent to the 1st compliance year, hold a minimum of lbs/yr of 90,953 NOx RTC's for operation of the gas turbine. In accordance with District Rule 2005 (f), unused RTC's may be sold only during the reconciliation period for the fourth quarter of the applicable compliance year inclusive of the 1st compliance year.~~

~~This condition shall apply to each turbine individually.~~

~~**Verification:** The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District in each Quarterly Operational Report (see AQ-C8).~~

AQ-32 The 2.0 PPM VOC emission limit(s) shall not apply during turbine commissioning, startup and shutdown periods. The commissioning period shall not exceed 415 operating hours. Startup time **periods** shall not exceed 60 minutes for each startup. Shutdown periods shall not exceed 60 minutes for each shutdown. The turbine shall be limited to a maximum of 200 startups per year. Written records of commissioning, startups and shutdowns shall be maintained and made available upon request from the District.

A gas turbine operating hour during the commissioning period consists of 60 operating minutes. An operating minute occurs when the gas turbine fuel flow during that minute is greater than zero.

For the purposes of this condition, the beginning of start-up occurs at initial fire in the combustor and the end of start-up occurs when the BACT levels are achieved. If during start-up the process is aborted and the turbine is restarted, then the start-up and restart will count as one start-up, provided the total time for the start-up does not exceed 60 minutes. The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United

~~States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).~~

AQ-35 [Deleted]

~~The owner/operator shall limit the total fuel usage for each turbine to no more than 1,500 million cubic standard feet (mmcsf) in any one calendar month.~~

~~The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.~~

~~**Verification:** The project owner shall submit fuel usage records and all other records and calculations required to demonstrate compliance with this condition as part of the Quarterly Operational Report required in **AQ-C8**.~~

AQ-36 The owner/operator shall keep records, in a manner approved by the District, for the following parameters or items:

Natural gas fuel use after CEMS certification.

~~Natural gas fuel use during the commissioning period.~~

~~Natural gas fuel use after the commissioning period and prior to the CEMS certification.~~

Verification: The project owner shall submit fuel usage records and all other records and calculations required to demonstrate compliance with this condition as part of the Quarterly Operational Report required in **AQ-C8**.

AQ-37 The owner/operator shall limit PM emissions from this facility to less than 100 tons in any one year. For the purpose of this condition, the PM emission limit shall be applicable to particulate matter with an aerodynamic diameter of less than 2.5 microns. For the purpose of this condition, any one year shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month. **The operator shall calculate the emissions using the calendar monthly fuel use data and the following emission factors: PM2.5: 4.66 lb/mmcsf for Gas Turbines No. 5 and No. 7 and 5.15 lb/mmcsf for Boiler No. 4.**

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report of Condition of Certification **AQ-C8**.

AQ-40 [Deleted]

~~The operator shall on completion of construction, operate and maintain this equipment according to the following specifications:~~

~~The combined cycle gas turbine units 5 and 7 shall not operate simultaneously with boiler units 1, 2, or 3 except for the 90 day period as stipulated in District Rule 1313. El Segundo Power shall surrender the Permit to Operate (P/N~~

F14448) for boiler no. 3 within 90 days of the start-up of the combined cycle gas turbines.

Verification: ~~The project owner shall make the site available for inspection by representatives of the District, CARB, EPA and the Commission.~~

IT IS SO ORDERED.

CERTIFICATION

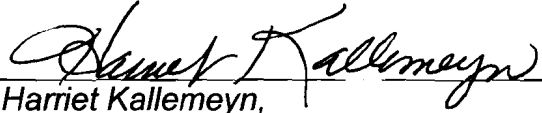
The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of an Order duly and regularly adopted at a meeting of the California Energy Commission held on January 14, 2015.

AYE: Weisenmiller, Douglas, McAllister, Hochschild, Scott

NAY: None

ABSENT: None

ABSTAIN: None


Harriet Kallemeyn,
Secretariat