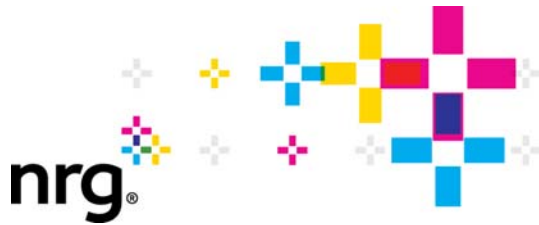


DOCKETED

Docket Number:	00-AFC-14C
Project Title:	El Segundo Power Redevelopment Project Compliance
TN #:	221427
Document Title:	NRG Data Responses to Energy Commission Data Requests, set 2 (TN #221365)
Description:	Data Responses for the El Segundo Energy Center Petition to Amend proceeding.
Filer:	Mike Monasmith
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	10/6/2017 5:42:45 PM
Docketed Date:	10/6/2017



El Segundo Energy Center LLC
301 Vista Del Mar
El Segundo, CA 90245
Phone: 310-615-6342
Fax: 310-615-6060

October 6, 2017

Mike Monasmith
Senior Project Manager
Siting Office, Transmission and Environmental Protection (STEP) Division
California Energy Commission
1516 Ninth Street, MS-2000
Sacramento, CA 95814

**Subject: El Segundo Energy Center Project (CEC Docket No. 00-AFC-14C)
Response to Visible Plume and Air Quality Modeling Data Request**

Dear Mr. Monasmith:

Thank you for your response to the Petition to Amend (Petition) that was submitted on August 15, 2017 to the California Energy Commission (CEC) by El Segundo Energy Center LLC (Petitioner) for the El Segundo Energy Center (ESEC) Project (CEC Docket No. 00-AFC-14C), located at 301 Vista Del Mar, El Segundo, California. With this letter, the Petitioner is providing the following responses to your data requests on the Petition.¹

CEC Data Request#1

Please provide the corresponding stack exhaust moisture contents (% by weight), mass flow rates (1000 lbs/hr), and average molecular weight (lbs/mole) for each of the scenarios listed in Table 2 of the facility owner's response (TN# 221064).

Petitioner Response #1:

Please refer to Attachment A for the stack exhaust moisture content, mass flow rate, and average molecular weight for each of the scenarios listed in Table 2 of the Petitioner's previous response (TN#221064). For convenience, the previously submitted Table 2 is included in Attachment A as well.

CEC Comment #2

Please provide the corresponding stack exhaust velocities for each of the scenarios listed in Table 2 of the facility owner's response.

Petitioner Response #2

Please refer to Attachment A for the stack exhaust velocity for each of the scenarios listed in Table 2 of the Petitioner's previous response (TN#221064). For convenience, the previously submitted Table 2 is included in Attachment A as well.

¹ Comments on the Petition were received via email September 25, 2017.

CEC Comment #3

Please provide the corresponding emission rates (in lbs/hr) of criteria pollutants (NOx, CO, SO2, PM10 and PM2.5) for each of the scenarios listed in Table 2 of the facility owner's response.

Petitioner Response #3

Please refer to Attachment A for the emission rates in pounds per hour of criteria pollutants for each of the scenarios listed in Table 2 of the Petitioner's previous response (TN#221064). For convenience, the previously submitted Table 2 is included in Attachment A as well.

CEC Comment #4

Please confirm whether the worst-case emissions during startups and shutdowns would increase after the proposed modifications. If yes, please provide the increased worst-case emission rates during startups and shutdowns.

Petitioner Response #4:

Per Siemens, the turbine manufacturer, the worst-case emissions during start-up and shut-down, will not be impacted as a result of the proposed modification. As such, historical worst-case emissions representation previously presented to the CEC are still valid and appropriate. Please refer to Attachment B of this letter for related communications on this topic with South Coast Air Quality Management District.

If you have any questions or need further information, please do not hesitate to contact me at (760) 710-2156.

Best Regards,



George Piantka, PE
Sr. Director, Regulatory Environmental Services
NRG Energy, Inc.

Attachments

cc: Melissa Hillman, Sierra Research/Trinity Consultants
Ken Riesz, El Segundo Energy Center LLC

Attachment A

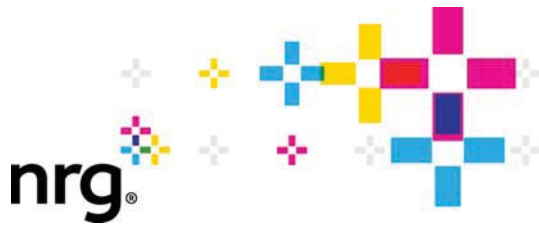
Stack Temperatures, Exhaust Parameters, and Emission Rates after the Proposed Modifications

Load Level, % [1]	100%	100%	100%	100%	100%	75%	50%	75%	50%	75%	50%	75%	50%	75%	50%	100%	100%	100%	100%
Ambient Dry Bulb Temperature, °F [1]	37.0	49.0	59.0	85.0	90.0	37.0	37.0	49.0	49.0	59.0	59.0	85.0	85.0	90.0	90.0	77.8	77.8	59	90
Ambient Relative Humidity (RH), % [1]	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	49.6%	49.6%	60%	60%
Stack Temperature, °F [1]	341	339	336	335	336	338	336	335	333	331	331	322	320	321	318	334	332	338	328
Exhaust Moisture Content, % by wt [2]	5.25	5.25	5.69	5.83	5.94	4.89	4.74	4.89	4.74	5.31	5.16	5.31	5.42	5.31	5.31	5.83	8.63	8.63	9.35
Exhaust Flow Rates, 1000 lbs/hr [2]	4,026	4,026	3,972	3,811	3,756	3,018	2,804	3,018	2,804	2,974	2,758	2,974	2,629	2,974	2,660	3,811	3,921	3,921	3,888
Average Molecular Weight, lbs/lb-mole [2]	28.42	28.42	28.35	28.32	28.3	28.45	28.46	28.45	28.46	28.38	28.39	28.38	28.35	28.38	28.37	28.32	27.86	27.86	27.75
Exhaust Velocities, lb/sec [2]	1,118	1,118	1,103	1,059	1,043	838	779	838	779	826	766	826	730	826	739	1,059	1,089	1,089	1,080
Exhaust Flow, dscfm (F-Factor) [3]	737,378	737,378	716,434	683,423	670,851	636,544	505,147	636,544	505,147	620,457	490,017	620,457	461,941	620,457	469,790	683,423	652,898	652,898	635,677
NOx, lb/hr [3]	15.44	15.44	15.31	14.59	14.35	12.48	9.59	12.48	9.59	12.34	9.46	12.34	8.95	12.34	9.07	14.59	15.44	15.44	15.41
CO, lb/hr [3]	9.40	9.40	9.32	8.88	8.74	7.59	5.84	7.59	5.84	7.51	5.76	7.51	5.45	7.51	5.52	8.88	9.40	9.40	9.38
SO2, lb/hr [4]	1.46	1.46	1.44	1.38	1.35	1.18	0.90	1.18	0.90	1.16	0.89	1.16	0.84	1.16	0.86	1.38	1.46	1.46	1.45
PM10, lb/hr [5]	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
PM2.5, lb/hr [5]	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5

- Based on the heat balance runs data for the performance upgrade from Siemens
- Exhaust parameters are approximated by the values provided in the GT performance run data at the closest load, ambient temperature and RH conditions.
- NOx, CO emission rates (lb/hr) are calculated based on the emission limits (ppmv) in the Title V permit for El Segundo Power, LLC, issued 11/25/2014, and an exhaust flow rate (dscfm) calculated based on natural gas F-Factor (dscf/MMBtu) = 8710
NOx, CO emission limits are ppmv at 15 O2, dry basis
- Calculated based on natural gas S content and heat content (HHV).
Natural gas S content (S gr/100 scf) = 0.25 per Title V permit for El Segundo Power, LLC, issued 11/25/2014.
Natural gas heat content (HHV), Btu/scf = 1028
- PM10 (and PM2.5) emission rates are based on the SCAQMD engineering evaluation for El Segundo Power Redevelopment Project (00-AFC-14C), Table 8, 5/18/2010.

DOCKETED

Docket Number:	00-AFC-14C
Project Title:	El Segundo Power Redevelopment Project Compliance
TN #:	221064
Document Title:	NRG Letter Regarding El Segundo Energy Center Turbine Upgrade Response to Data Request
Description:	N/A
Filer:	Dale Rundquist
Organization:	NRG Energy, Inc.
Submitter Role:	Applicant
Submission Date:	9/6/2017 2:05:20 PM
Docketed Date:	9/6/2017



El Segundo Power, LLC
301 Vista Del Mar
El Segundo, CA 90245
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Fax: 310-615-6060

August 31, 2017

Dale Rundquist
Compliance Project Manager
Siting, Transmission and Environmental Protection (STEP) Division
California Energy Commission
1516 Ninth Street, MS-2000
Sacramento, CA 95814

Subject: El Segundo Energy Center Project (CEC Docket No. 00-AFC-14C) – Response to Data Request

Dear Mr. Rundquist:

Thank you for your response to the Petition to Amend (Petition) that was submitted on August 15, 2017 to the California Energy Commission (CEC) by El Segundo Power, LLC (Petitioner) for the El Segundo Energy Center (ESEC) Project (CEC Docket No. 00-AFC-14C), located at 301 Vista Del Mar, El Segundo, California. With this letter, the Petitioner is providing the following responses to your comments on the Petition.¹

CEC Comment #1

Please provide estimates of the number of workers and vehicle trips associated with the proposed turbine upgrades.

- *The PTA only states that modifications “will not require extensive labor” (Socio), and “project related traffic and transportation, and associated onsite personnel for this modification will be akin to normal maintenance activities.”*
- *Staff needs to know what the traffic level is during maintenance to know if the traffic will be substantial or not.*

Petitioner Response:

The number of workers for normal operations was discussed in the Final Staff Assessment for the El Segundo Power Facility Modification Amendment (00-AFC-14C), August 2015 and was estimated to be 50 workers after the modifications associated with that Petition. As you know, that proposed Amendment was canceled in August 2016. But the analysis in that FSA was relevant. Our work force during normal operations of El Segundo Energy Center Units 5-8 is about 30 personnel. For this Petition, we anticipate approximately 30 additional personnel for the proposed upgrade for ESEC gas turbines, which is anticipated to take 2-3 weeks during spring 2018, as noted in the Petition. Conservatively, we would anticipate 60 vehicle trips per day (round trip) to the site for work force and that similar traffic levels as analyzed during the El Segundo Power Facility Modification Amendment are anticipated. We anticipate the work to be conducted using normal maintenance type vehicles/trucks, which can include the use of lower profile crane(s) to assist with the removal/placement of turbine equipment during the upgrade of the respective turbines. The onsite laydown and parking areas will be utilized during the turbine performance upgrade work.

¹ Comments on the Petition were received via email August 16, 2017.


CEC Comment #2

Please provide the stack exhaust temperatures before and after the upgrade (for assessing any change in visible plume potential).

Petitioner Response: Exhaust temperatures for the gas turbines before and after the proposed modifications are included in Attachment A to this letter.

If you have any questions or need further information, please do not hesitate to contact me at (760) 710-2156.

Best Regards,



George Piantka, PE
Sr. Director, Regulatory Environmental Services
NRG Energy, Inc.

Attachment

cc: Melissa Hillman, Sierra Research/Trinity Consultants
Ken Riesz, El Segundo Power, LLC

Attachment A

Exhaust Temperatures Before and After the Gas Turbine Upgrade Project

Table 1. Stack Temperatures before the Proposed Modifications

Performance Runs	1	2	3	4	5	6	7	8	9	10	14	15	21	25	26
Load Level, %	100%	100%	Pwr Aug	50%	100%	100%	Pwr Aug	50%	100%	100%	60%	50%	100%	60%	50%
Ambient Dry Bulb Temperature, °F	77.8	77.8	77.8	77.8	83.0	83.0	83.0	83.0	62.0	62.0	62.0	62.0	41.0	41.0	41.0
Ambient Relative Humidity (RH), %	49.5%	49.6%	49.6%	49.5%	46.9%	47.0%	47.0%	46.9%	70.0%	69.9%	69.9%	69.9%	75.9%	75.9%	75.9%
Stack Temperature, °F	354	358	361	336	351	356	360	334	363	361	345	340	369	350	346

Source: Turbine Performance Data Sheet from the Original 2007 ESEC permit documents.

Pwr Aug = Power Augmentation

Table 2. Stack Temperatures after the Proposed Modifications

Load Level, %	100%	100%	100%	100%	100%	75%	50%	75%	50%	75%	50%	75%	50%	75%	50%	100%	Pwr Aug	Pwr Aug	Pwr Aug
Ambient Dry Bulb Temperature, °F	37.0	49.0	59.0	85.0	90.0	37.0	37.0	49.0	49.0	59.0	59.0	85.0	85.0	90.0	90.0	77.8	77.8	59.0	90.0
Ambient Relative Humidity (RH), %	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	50%	50%	60%	60%
Stack Temperature, °F	341	339	336	335	336	338	336	335	333	331	331	322	320	321	318	334	332	338	328

Source: Heat Balance Runs Data for the 2017 Gas Turbine Upgrade.

Pwr Aug = Power Augmentation

Attachment B

From: Piantka, George <George.Piantka@nrg.com>
Sent: Thursday, September 21, 2017 8:28 AM
To: Christian Aviles
Cc: Andrew Lee
Subject: RE: El Segundo Power Redevelopment Project Compliance, 00-AFC-14C, NRG Letter Regarding El Segundo Energy Center Turbine Upgrade Response to Data Request

Christian,

As follow up to information provided below, I discussed your questions further with Siemens Engineering regarding emissions during different operating loads with this modification. As noted below, a difference in startup and shutdown emissions are not anticipated from the proposed upgrade. With respect to startup emissions, Siemens indicates that there will no change to the fuel flow or exhaust flow during startup. With respect to shutdown emissions, this upgrade is expected to provide a heat rate decrease (improved efficiency) and therefore, at a minimum, shutdown emission are not expected to change from the current design. Regarding a comparison of projected emissions at different loads for the modification vs. the original package, Siemens anticipates that the efficiencies (reduction in heat rate) will be experienced at different loads above minimum load and the corresponding permit limits will continue to be met.

An update on your progress would be greatly appreciated.

Best Regards,

George Piantka, PE
Sr. Director, Regulatory Environmental Services
NRG Energy, Inc.
5790 Fleet Street, Suite 200
Carlsbad, CA 92008
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george.piantka@nrg.com

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From: Piantka, George
Sent: Tuesday, September 19, 2017 8:38 AM
To: 'Christian Aviles'
Cc: Andrew Lee
Subject: RE: El Segundo Power Redevelopment Project Compliance, 00-AFC-14C, NRG Letter Regarding El Segundo Energy Center Turbine Upgrade Response to Data Request

Hello Christian and Andrew,

I discussed your questions further with Siemens Engineering. A difference in startup and shutdown emissions are not anticipated. With respect to startup emissions, Siemens indicates that there will no change to the fuel flow or exhaust

flow during startup. We are looking into whether Siemens anticipates any changes with respect to emissions rates following the modification are different operating loads. I'll update you by the end of the week. But as stated in the application, the equipment will continue to meet the emission limits within the operating load ranges – so no change.

Can you please give me an update as when you will submit your analysis to the CEC? We are chasing schedule to make the CEC's Business Meeting by November. I believe CEC may be ready for an October meeting pending the air district's analysis. The project manager for the CEC is Mike Monasmith in the event you were not aware.

Best Regards,

George Piantka, PE
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From: Christian Aviles [<mailto:caviles@aqmd.gov>]
Sent: Friday, September 08, 2017 11:34 AM
To: Piantka, George
Cc: Andrew Lee
Subject: RE: El Segundo Power Redevelopment Project Compliance, 00-AFC-14C, NRG Letter Regarding El Segundo Energy Center Turbine Upgrade Response to Data Request

Hi George,

I did a cursory review of the application package. The package you've sent looks very good. With this modification, one of the focuses will be the emissions comparison. I see that some information was sent on projections of emissions after the modification compared to actual operations the past few years, but it seemed that package focuses on what happens during normal base operations. Maybe I just need to be pointed to something within the package, but I don't see projections for conditions like start-up and shut-down. I know it's stated that the project will at least meet the current start-up/shutdown provisions, but are there projected differences? Is the manufacturer simply guaranteeing meeting the current standards and we assume the exact same emissions based on the original package. What I would like to do with this evaluation is compare projected emissions after the modification vs the original package evaluation, at the different operational statuses. I seem to see that information for normal base load operations, but I would like more information on possible changes to start-up/shutdown, as well. Let me know if you have any questions, regarding what I'm requesting. Thanks.

Christian Aviles
Air Quality Engineer

South Coast Air Quality Management District
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Fax: (909) 396-3841
E-Mail: caviles@aqmd.gov

From: Piantka, George [<mailto:George.Piantka@nrg.com>]
Sent: Wednesday, September 6, 2017 2:30 PM
To: Christian Aviles <caviles@aqmd.gov>
Cc: Andrew Lee <ALee@aqmd.gov>
Subject: FW: El Segundo Power Redevelopment Project Compliance, 00-AFC-14C, NRG Letter Regarding El Segundo Energy Center Turbine Upgrade Response to Data Request

Hello Christian,

Refer to my earlier email. Here is the second item docketed – our response to a data request.

Best Regards,

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From: eFiling@energy.ca.gov [<mailto:eFiling@energy.ca.gov>]
Sent: Wednesday, September 06, 2017 2:13 PM
To: Piantka, George; e-recipient@caiso.com; kchristensen@elsegundo.org; ljester@ci.manhattan-beach.ca.us; publicadviser@energy.ca.gov; efilingPOSarchive@energy.ca.gov; john.mckinsey@leclairryan.com; murphyperkins@gmail.com; camille.remy-obad@energy.ca.gov; Erinn.Wilson@wildlife.ca.gov; LTisopulos@aqmd.gov
Subject: El Segundo Power Redevelopment Project Compliance, 00-AFC-14C, NRG Letter Regarding El Segundo Energy Center Turbine Upgrade Response to Data Request