

DOCKETED

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Project Title:	Alamitos Energy Center
TN #:	210269
Document Title:	SCAQMD Correspondence Regarding AEC Questions Set No. 3 - Corrected and Set No. 4
Description:	N/A
Filer:	Jerry Salamy
Organization:	CH2M HILL
Submitter Role:	Applicant Consultant
Submission Date:	2/11/2016 1:11:26 PM
Docketed Date:	2/11/2016

From: Salamy, Jerry/SAC
To: "Vicky Lee"; "stephen.okane@AES.com"
Cc: "John Yee"; "Andrew Lee"; Salazar, Cindy/SCO
Subject: RE: AES Alamos--AEC Questions Set No. 3 - CORRECTED
Date: Thursday, January 28, 2016 2:28:00 PM

Hi Vicky,

Please see our responses below.

26. Commissioning Fuel Usage for Turbines

As in previous AES projects, the following information is needed to determining an factor(s) for the commissioning period.

a. Combined-Cycle Turbines

For Table 5.1B.1—Summary of Commissioning Emission Estimates: Combined-Cycle Turbines, please provide:

- i. Fuel use (mmscf/hr) for each activity,
- ii. Fuel use (mmscf/activity) for each activity.

Response: Table DR26a presents the combined-cycle turbine commissioning fuel use on a million standard cubic foot per hour (mmscf/hr) and mmscf/activity basis.

Table DR26a

Activity	Duration (hr)	CTG Load (%)	MMBtu/hr HHV	MMBtu/Activity	MMSCF/hr	MMSCF/Activity
CTG Testing (Full Speed No Load, FSNL)	48	10	721	34606	0.6866	32.9581
Steam Blows ¹	120	40	1333	159950	1.2694	152.3331
Set Unit HRSG & Steam Safety Valves	12	40	1333	15995	1.2694	15.2333
Steam Blows - Restoration						
DLN Emissions Tuning	12	50	1422	17061	1.3541	16.2487
Emissions Tuning	12	60	1566	18790	1.4913	17.8956
Emissions Tuning	12	80	1924	23088	1.8323	21.9881
Restart CTGs and run HRSG in Bypass Mode. STG Bypass Valve Tuning. HRSG Blow Down and Drum Tuning						
Verify STG on Turning Gear; Establish Vacuum in ACC Ext Bypass Blowdown to ACC (combined blows) commence tuning on ACC Controls; Finalize Bypass Valve Tuning. ACC cleaning	168	80	1924	323226	1.8323	307.8339
CT Base Load Testing/Tuning	24	100	2282	54769	2.1734	52.1613
Load Test STG / Combine Cycle (2X1) Tuning	48	50	1422	68244	1.3541	64.9947
STG Load Test/Combined Cycle Tuning	96	80	1924	184700	1.8323	175.9051
RATA / Pre-performance Testing/Source Testing	84	80	1924	161613	1.8323	153.9170
Source Testing & Drift Test Day 1	24	50	1422	34122	1.3541	32.4973

Source Testing & Drift Test Day 2	24	50	1422	34122	1.3541	32.4973
Source Testing & Drift Test Day 3	24	50	1422	34122	1.3541	32.4973
Source Testing & Drift Test Day 4	24	50	1422	34122	1.3541	32.4973
Source Testing & Drift Test Day 5	24	50	1422	34122	1.3541	32.4973
Source Testing & Drift Test Day 6	24	50	1422	34122	1.3541	32.4973
Source Testing & Drift Test Day 7	24	50	1422	34122	1.3541	32.4973
Performance Testing	132	100	2282	301232	2.1734	286.8873
CALISO Certification & Testing / PPA Testing	60	75	2282	136923	2.1734	130.4033
Total for One CTG	996					
Total for Two CTGs (One 2x1 Block)	1,992					

b. Simple-Cycle Turbines

For Table 5.1B.1—Summary of Commissioning Emission Estimates: Simple-Cycle Turbines, please provide:

- i. Fuel use (mmscf/hr) for each activity,
- ii. Fuel use (mmscf/activity) for each activity.

Response: Table DR26b presents the simple-cycle turbine commissioning fuel use on a million standard cubic foot per hour (mmscf/hr) and mmscf/activity basis.

Table DR26b

Activity	Duration [hr]	CTG Load [%]	MMBtu/hr HHV	MMBtu/Activity	MMSCF/hr	MMSCF/Activity
Unit 1 Testing (Full Speed No Load, FSNL)	4	5	194	776	0.1848	0.7390
Unit 1 DLN Emissions Tuning1	12	100	880	10560	0.8381	10.0571
Unit 1 Emissions Tuning1	12	75	645	7740	0.6143	7.3714
Unit 1 Base Load Testing	12	75	645	7740	0.6143	7.3714
No Operation						
Install Temporary Emissions Test Equipment						
Refire Unit 1	12	100	880	10560	0.8381	10.0571
Unit 1 Source Testing & Drift Test Day 1-5 RATA / Pre-performance Testing/ Part 60/75 Certification and Source Testing	168	100	880	147840	0.8381	140.8000
Unit 1 Water Wash & Performance preparation	24	100	880	21120	0.8381	20.1143
Unit 1 Performance						

Testing	24	100	880	21120	0.8381	20.1143
Install Temporary Emissions Test Equipment						
Unit 1 CALISO Certification	12	100	880	10560	0.8381	10.0571

27. Ammonia Tanks

- a. A/N 579167 and A/N 579168 were submitted for the CCGT and SCGT tanks, respectively. Both Forms 400-E-18—Storage Tank indicate the tanks are both 13 ft dia. and 45 ft long. Pg. 2-15 describes both tanks as 40,000 gallons each. SCAQMD Letter, dated 11/20/15, item 2—~~Fees~~ requested confirmation that the calculated fees, including the assumption that the two tanks are identical, are correct, and confirmation was received.

Then I noticed that the revised Form 400-E-5—Selective Catalytic Reduction (SCR) System, Oxidation Catalyst, and Ammonia Catalyst, provided in Attachment 5 to your 12/11/15 letter, indicate the AEC SCGT tank is 30,000 gallons. *Section 5.5—Hazardous Materials Handling* of the AFC is not part of the SCAQMD application package, but I checked that section on the CEC website to obtain a process description and tank capacities. Section 5.5 indicates the CCGT tank is 40,000 gallons and the SCGT tank is 30,000 gallons. These tank capacities were confirmed by the AES response to CEC Data Request 146.

If the SCGT tank is not identical to the CCGT tank, please send me the following:

- i. Revised Form 400-E-18—Storage Tank
- ii. A check for \$1140.99. [(\$1521.32 for tank + \$760.66 for expedited) – (\$760.66 paid as identical + \$380.33 paid for expedited) = \$1140.99]

Response: AES confirmed that the SCGT ammonia tank volume is 40,000 gallons. No revisions to the SCGT ammonia tank Form 400-E-18 or additional fees are required. Thanks for noting this discrepancy as we can now correct the tank volume with the CEC.

Jerry Salamy
Principal Project Manager
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Cell Phone: 916.769.8919

From: Vicky Lee [mailto:VLee1@aqmd.gov]
Sent: Wednesday, January 27, 2016 6:26 PM
To: stephen.okane@AES.com; Salamy, Jerry/SAC <Jerry.Salamy@CH2M.com>
Cc: John Yee <JYee@aqmd.gov>; Andrew Lee <ALee@aqmd.gov>
Subject: AES Alamos--AEC Questions Set No. 3

Stephen O’Kane and Jerry Salamy,

As I am working on the PDOC, I have two more questions. I am continuing the numbering from

our 11/20/15 letter (set no. 1) and 12/18/15 e-mail (set no. 2).

26. Commissioning Fuel Usage for Turbines

As in previous AES projects, the following information is needed to determining an factor(s) for the commissioning period.

a. Combined-Cycle Turbines

For Table 5.1B.1—Summary of Commissioning Emission Estimates: Combined-Cycle Turbines, please provide:

- i. Fuel use (mmscf/hr) for each activity,
- ii. Fuel use (mmscf/activity) for each activity.

b. Simple-Cycle Turbines

For Table 5.1B.1—Summary of Commissioning Emission Estimates: Simple-Cycle Turbines, please provide:

- i. Fuel use (mmscf/hr) for each activity,
- ii. Fuel use (mmscf/activity) for each activity.

27. Ammonia Tanks

- a. A/N 579167 and A/N 579168 were submitted for the CCGT and SCGT tanks, respectively. Both Forms 400-E-18—Storage Tank indicate the tanks are both 13 ft dia. and 45 ft long. Pg. 2-15 describes both tanks as 40,000 gallons each. SCAQMD Letter, dated 11/20/15, item 2—Fees requested confirmation that the calculated fees, including the assumption that the two tanks are identical, are correct, and confirmation was received.

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Thanks for your assistance.

Vicky Lee
Air Quality Engineer
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765-4178
909-396-2284

From: Salamy, Jerry/SAC
To: "Vicky Lee"; stephen.okane@AES.com
Cc: [John Yee](#); [Andrew Lee](#); [Salazar, Cindy/SCO](#); [Beattie, Benjamin/SAC](#)
Subject: RE: AES Alamos--AEC Questions Set No. 4
Date: Tuesday, February 02, 2016 12:06:00 PM

Hi Vicky,

Below is AES's responses to your data requests.

15. Table 5.1-23—AEC Facility Emissions

- e. In your 12/11/15 letter, the response to item 15.a. is that **monthly** SO₂ emissions are based on the annual average fuel sulfur content of 0.25 grain per 100 dscf of natural gas because these emissions are used to determine compliance requirements for the RECLAIM program.
- i. AES Huntington Beach is RECLAIM for SO_x, but AES Alamos is not. Which compliance requirements for the RECLAIM program are you referring to?

Response: The reference to the Regional Clean Air Incentives Market (RECLAIM) program in response to item 15.a. was in error.

- ii. Typically, **annual** SO₂ emission limits are based on 0.25 grain per 100 dscf of natural gas, but **monthly** SO₂ emission limits are based on 0.75 grain per 100 dscf. Since AES Huntington Beach is RECLAIM for SO_x, the applicable limit is a 1-year average. Since AES Alamos is not RECLAIM for SO_x, AEC will need to meet the monthly limit each and every month. Please confirm the maximum monthly emission limit is to be based on 0.25 grain per 100 dscf of natural gas.

Response: The Alamos Energy Center's (AEC) maximum monthly oxides of sulfur emission limits should be based on 0.75 grains per 100 dry standard cubic feet of natural gas (see the response to item 15.f.i.bb.).

- f. In your 12/11/15 letter, your response to item 15.d. is that the **maximum** monthly emissions are based on the annual average operating scenario at 65.3 °F because these emissions are used to determine compliance requirements for RECLAIM.
- i. For the purpose of determining offsets, the maximum monthly emissions are used. The maximum emissions rates and maximum gross output occur at 59 °F (case 12).
- aa. Please explain which RECLAIM requirements dictate that 65.3 °F be used.

Response: The reference to the RECLAIM program in response to item 15.d. was in error.

- bb. Please explain why the maximum monthly emissions are not based on 59 °F (case 12).

Response: The highest monthly emissions should be based on using the emissions associated with the 28 °F case (Case 1). As such, below is a revised permit application Table 5.1-23R showing the maximum monthly emissions using the 28 °F case emissions data. The revisions to Table 5.1-23R are presented in an underlined/strike-through format.

AEC Facility Emissions

	NO_x	SO₂^a	VOC^b	CO	PM₁₀	PM_{2.5}
Maximum Hourly Emissions, lb/hr						
Per GE 7FA.05 ^c	16.5	4.86	1.58	10.0	8.50	8.50
Per GE LMS-100 ^d	8.23	1.62	2.30	8.01	6.23	6.23
Auxiliary Boiler ^{ed}	0.42	0.048	0.28	2.83	0.30	0.30
Average Daily Facility Emissions ^{fe} , lb/day	1,782 <u>1,802</u>	160 <u>104</u>	562 <u>765</u>	2,600 <u>2,739</u>	1,044	1,044
Maximum Monthly Facility Emissions ^{gf} , lb/month	53,461 <u>54,065</u>	4,811 <u>12,124</u>	16,861 <u>22,943</u>	78,000 <u>82,170</u>	31,312	31,312
Average Annual Facility Emissions, tpy ^{hg}	134	11.3	49.4	246	69.3	69.3

^a Hourly, daily, and monthly SO₂ emissions are based on a maximum fuel sulfur content of 0.75 grain per 100 dscf of natural gas. Daily, monthly, and annual SO₂ emissions are based on an average fuel sulfur content of 0.25 grain per 100 dscf of natural gas.

^b Average daily, maximum monthly, and average annual facility emissions include VOC emissions from two oil-water separator systems (see Appendix 5.1B, Table 5.1B.17).

^c Maximum hourly VOC, CO, and NO_x emissions were based on a cold startup. Maximum hourly SO₂, PM₁₀, and PM_{2.5} emissions were based on each turbine operating at full load at 28°F. Maximum hourly emissions were based on each turbine operating at full load at 28°F. Startup and shutdown emissions are not included.

^d Maximum hourly VOC, CO, and NO_x emissions were based on one hot startup, one shutdown, and the balance of the hour at full load at 28°F. Maximum hourly SO₂, PM₁₀, and PM_{2.5} emissions were based on each turbine operating at full load at 28°F.

^{ed} Maximum hourly emissions assume operation at 100 percent load. Startup emissions are not included.

^{fe} Average daily emissions represent the maximum monthly total divided by 30 days.

^{gf} Maximum monthly emissions are based on the following:

- GE 7FA.05s: 2 cold startups, 15 warm startups, 45 hot startups, 62 shutdowns, and 681 hours of steady-state operation at 100 percent load and ~~65.3~~28°F.
- GE LMS-100s: 62 hot startups, 62 shutdowns, and 700 hours of steady-state operation at 100 percent load and ~~65.3~~28°F.
- Auxiliary Boiler: 10 startups and 31 days of operation.

^{hg} Average annual emissions are based on the following:

- GE 7FA.05s: 24 cold startups, 100 warm startups, 376 hot startups, 500 shutdowns, and 4,100 hours of steady-state operation at 100 percent load and 65.3°F.
- GE LMS-100s: 500 hot startups, 500 shutdowns, and 2,000 hours of steady-state operation at 100 percent load and 65.3°F.
- Auxiliary Boiler: 120 startups and 365 days of operation.

ii. Please confirm the maximum annual emissions are based on case 4 at 65.3 °F, which has the maximum emissions at the average annual temperature.

Response: The maximum annual emission estimates are based on case 4 with an ambient temperature of 65.3 °F.

Thanks,

Jerry Salamy
Principal Project Manager
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From: Vicky Lee [mailto:VLee1@aqmd.gov]
Sent: Friday, January 29, 2016 6:28 PM
To: stephen.okane@AES.com; Salamy, Jerry/SAC <Jerry.Salamy@CH2M.com>
Cc: John Yee <JYee@aqmd.gov>; Andrew Lee <ALee@aqmd.gov>
Subject: AES Alamos--AEC Questions Set No. 4

Stephen O'Kane and Jerry Salamy,

As I am working on the PDOC, I have the follow-up questions. I am continuing the numbering from our 11/20/15 letter (set no. 1), 12/18/15 e-mail (set no. 2), and 1/27/16 e-mail (set no. 3).

15. Table 5.1-23—AEC Facility Emissions

- e. In your 12/11/15 letter, the response to item 15.a. is that **monthly** SO₂ emissions are based on the annual average fuel sulfur content of 0.25 grain per 100 dscf of natural gas because these emissions are used to determine compliance requirements for the RECLAIM program.
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 - aa. Please explain which RECLAIM requirements dictate that 65.3 °F be used.
 - bb. Please explain why the maximum monthly emissions are not based on 59 °F (case 12).
 - ii. Please confirm the maximum annual emissions are based on case 4 at 65.3 °F, which has the maximum emissions at the average annual temperature.

Thanks for your assistance. I will be in on Monday.

Vicky Lee
Air Quality Engineer
South Coast Air Quality Management District

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