DOCKETED

Docket Number:	12-AFC-02C
Project Title:	Huntington Beach Energy Project - Compliance
TN #:	210300
Document Title:	Huntington Beach Energy Project Data Requests A75-A77
Description:	N/A
Filer:	Cindy Salazar
Organization:	CH2M HILL
Submitter Role:	Applicant Consultant
Submission Date:	2/12/2016 4:13:33 PM
Docketed Date:	2/12/2016

Huntington Beach Energy Project

(12-AFC-02C)

Data Responses

(Response to Data Requests A75-A77)

Submitted to

California Energy Commission

Prepared by

AES Southland Development, LLC

With Assistance from

CH2MHILL®
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

February 15, 2016

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Introduction

Attached are AES Southland Development, LLC's (AES or the Project Owner) responses to the California Energy Commission (CEC) staff's Data Requests A75 - A77 regarding the Huntington Beach Energy Project (HBEP) (12-AFC-02) Petition to Amend (PTA).

Data Requests A75, A76, and A77

BACKGROUND

The Huntington Beach Energy Project (HBEP) Petition to Amend (PTA, TN# 206087) Table 5.1-14 note c states that the fuel use of the auxiliary boiler was based on operation at 100 percent load and the computed annual fuel use assumed 120 startups and 8,760 hours of operation. PTA Table 5.1-14 shows the maximum hourly fuel use of 70.8 million British thermal units per hour (MMBtu/hr) and annual fuel use of 310,096 MMBtu/year. Based on these numbers, staff computes that the auxiliary boiler would operate about 4,380 (=310,096/70.8) hours per year, instead of 8,760 hours, if operated at full load.

In the Alamitos Energy Center's response to South Coast Air Quality Management District (TN# 207265) dated January 7, 2016, AES stated that the auxiliary boiler would be operated at its minimum turndown rate until a combined-cycle turbine start is requested. To be conservative, AES assumed an average hourly fuel consumption of 35.3 (MM Btu/hr) rather than the hourly fuel consumption at minimum turndown rate. Staff would like to know if the same assumptions were used for the Amended HBEP.

The proposed HBEP auxiliary boiler would be equipped with a selective catalytic reduction (SCR) system, which would use 19 percent aqueous ammonia to reduce NOx emissions. The Petition to Amend (TN# 206087) Table 5.1-13 shows 5 ppmvd (or 0.3 lbs/hr) ammonia slip from the SCR of the auxiliary boiler. However, staff is not able to find the annual ammonia emissions estimated or analyzed in the health risk assessment for the Amended HBEP.

DATA REQUESTS

- A75. Please provide the expected annual operating profile for the auxiliary boiler of the Amended HBEP, accounting for startup, startup duration, and operations at various loads.

Response: The auxiliary boiler's annual operating profile assumes the auxiliary boiler will be operated 8760 hours per year, including 24 cold startup and 48 warm startups, 48 hot startups, and 120 shutdowns. The auxiliary boiler will be used to provide enhanced startup times by maintaining the steam cycle in a ready state through the provision of steam for heat recovery steam generator (HRSG) sparging, turbine steam seals, steam pipe warming, condenser deareating steam, and for steam to the fuel gas heater. Prior to a combined-cycle gas turbine (CCGT) startup, the auxiliary boiler will increase load from the minimum turndown rate (approximately 18 MMBtu/hr) to the maximum load (approximately 70.8 MMBtu/hr) and the produced steam will be directed to the system for HRSG sparging, turbine seals, pipe warming, condenser deareating, and to the fuel gas heater. Once the CCGT completes a startup and the steam turbine reaches maximum output, the auxiliary boiler will reduce load to the minimum turndown firing rate. If extended periods of CCGT outage are expected, the auxiliary boiler could be shutdown until a start of the CCGT is expected.

- A76. Please provide the annual ammonia emissions estimates for the auxiliary boiler in lbs per year or tons per year.

Response: Based on the data presented in the HBEP Petition to Amend Appendix 5.1B, Table 5.1B.11, the annual HBEP auxiliary boiler ammonia emission rate is 694 pounds per year or 0.35 tons.[1]

- A77. Please include the ammonia emissions of the auxiliary boiler in the health risk assessment.

Response: The Project Owner revised the HBEP Health Risk Assessment (HRA) to include the emissions of ammonia from the auxiliary boiler. In addition to the annual emission rate calculated above, a maximum hourly emission rate of 0.16 lb/hr was used for the acute HRA (assuming the maximum hourly fuel use of 70.8 MMBtu per hour). A summary of the excess cancer risk and chronic and acute hazard indices at the PMI, as well as the maximum predicted public health impacts for worker, residential, and sensitive receptors, has been included in

[1] Based on 5 ppmvd of ammonia at 3 percent oxygen, exhaust gas water and oxygen content of 10.03 and 4.36 weight percent respectively, and an annual fuel use of 310,096 MMBtu per year.

Tables 5.9-4R and 5.9-5R, which are revisions to Tables 5.9-4 and 5.9-5 of the HBEP PTA. The results in Table A77-1 represent a comparison of the total predicted Amended HBEP impact to the SCAQMD's CEQA significance thresholds, while the results in Table A77-2 represent the predicted risk for each individual emission unit in accordance with SCAQMD Rule 1401. The model input and output files are included with this submission on compact disc.

As shown in Table A77-1, predicted impacts for the Amended HBEP are below the significance thresholds of 10 in 1 million for excess cancer risk and chronic and acute hazard index of 1.0. Therefore, the predicted health risks associated with the Amended HBEP will be less than significant.

TABLE A77-1
Operational Health Risk Assessment Summary: Facility [a]

Risk [b]	Receptor Number	Receptor Coordinates (UTM, m) Easting	Northing	Value
Cancer Risk at the PMI (per million) [c]	681	409700	3723500	4.27
Cancer Risk at the MEIR (per million) [c]	815	410000	3723700	2.68
Cancer Risk at a Sensitive Receptor (per million) [c]	12905	409969.5	3724223	1.49
Cancer Risk at the MEIW (per million) [d]	681	409700	3723500	0.15
Chronic Hazard Index at the PMI	681	409700	3723500	0.011
Chronic Hazard Index at the MEIR	815	410000	3723700	0.0068
Chronic Hazard Index at a Sensitive Receptor	12905	409969.5	3724223	0.0038
Chronic Hazard Index at the MEIW	681	409700	3723500	0.011
Acute Hazard Index at the PMI	552	409600	3723300	0.056
Acute Hazard Index at the MEIR	719	410000	3723550	0.019
Acute Hazard Index at a Sensitive Receptor	12902	410027.1	3723140	0.013
Acute Hazard Index at the MEIW	552	409600	3723300	0.056

[a] The results in Table A77-1 represent the combined predicted risk for all five combustion units operating simultaneously.

[b] A facility with an excess cancer risk less than 10 in 1 million individuals is considered to be less than significant. A chronic or acute hazard index less than 1.0 for the facility is considered to be a less-than-significant health risk.

[c] Cancer risk values are based on the Draft RMP methodology.

[d] Cancer risk values are based on the OEHHA Derived methodology.

Note:
UTM = Universal Transverse Mercator

As shown in Table A77-2, the GE Frame 7FA.05s exceed the incremental increase in cancer risk threshold of 1 in 1 million; therefore, best available control technology for toxics (T-BACT) will be required for these units. The GE LMS 100PBs and auxiliary boiler do not trigger the regulatory requirement for T-BACT as their predicted impacts are below the incremental increase in cancer risk threshold of 1 in 1 million. Although not required in all cases, the emission control technologies included in the Amended HBEP for all emission sources are considered to be T-BACT. All sources have predicted impacts below the chronic and acute hazard index of 1.0, resulting in less-than-significant impacts with controls.

It should be noted that the maximum impacts reported in Table A77-1 represent the maximum predicted impacts at one receptor from all sources combined. In contrast, the maximum impacts reported for each individual source in Table A77-2 may occur at different receptors. Therefore, the Amended HBEP totals in Table A77-2 are not directly additive and should not be directly compared to the results presented in Table A77-1.

Because the predicted cancer risk per individual GE Frame 7FA.05s unit is greater than 1 in 1 million, the cancer burden was calculated for each census block receptor consistent with SCAQMD guidance (SCAQMD, 2015b). The cancer burden for the Amended HBEP was estimated at 8.7×10^{-9}, which is well below the significance threshold of 0.5. Therefore, the Amended HBEP will not significantly increase cancer burden in the vicinity of the site.

TABLE A77-2
Operational Health Risk Assessment Summary: Individual Units [a]

Risk [b]	GE Frame 7FA.05-01	GE Frame 7FA.05-02	GE LMS 100PB-01	GE LMS 100PB-02	Auxiliary Boiler
Cancer Risk at the PMI (per million) [c]	1.71	2.37	0.086	0.086	0.30
Cancer Risk at the MEIR (per million) [c]	1.19	1.36	0.059	0.050	0.043
Cancer Risk at a Sensitive Receptor (per million) [c]	0.66	0.73	0.046	0.046	0.0078
Cancer Risk at the MEIW (per million) [d]	0.063	0.086	0.0031	0.0031	0.0088
Chronic Hazard Index at the PMI	0.0043	0.0060	0.00022	0.00022	0.00093
Chronic Hazard Index at the MEIR	0.0030	0.0034	0.00015	0.00013	0.00013
Chronic Hazard Index at a Sensitive Receptor	0.0017	0.0060	0.00012	0.00012	0.000024
Chronic Hazard Index at the MEIW	0.0043	0.0060	0.00022	0.00022	0.00093
Acute Hazard Index at the PMI	0.022	0.032	0.0017	0.0017	0.0011
Acute Hazard Index at the MEIR	0.0080	0.0090	0.0012	0.0012	0.00036
Acute Hazard Index at a Sensitive Receptor	0.0047	0.0065	0.00066	0.00070	0.00033
Acute Hazard Index at the MEIW	0.022	0.032	0.0017	0.0017	0.0011

[a] The results in Table A77-2 represent the predicted excess risk for each individual emission unit in accordance with SCAQMD Rule 1401.

[b] A source with an excess cancer risk less than 1 in 1 million individuals is considered to be less than significant. A source with an excess cancer risk less than 10 in 1 million is considered less than significant if T-BACT is installed. A chronic or acute hazard index less than 1.0 for each source is considered to be a less-than-significant health risk.

[c] Cancer risk values are based on the Draft RMP Derived methodology.

[d] Cancer risk values are based on the OEHHA Derived methodology.