

## DOCKETED

<b>Docket Number:</b>	13-AFC-01
<b>Project Title:</b>	Alamitos Energy Center
<b>TN #:</b>	211654
<b>Document Title:</b>	AEC Thermal Plume Information
<b>Description:</b>	N/A
<b>Filer:</b>	Jerry Salamy
<b>Organization:</b>	CH2M HILL
<b>Submitter Role:</b>	Applicant Consultant
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Mr. Keith Winstead  
 Project Manager  
 California Energy Commission  
 1516 Ninth Street  
 Sacramento, CA 95814-5512

May 25, 2016

Subject: Alamitos Energy Center (13-AFC-01) Response to Informal Data Request

Dear Mr. Winstead:

On May 17, 2016, California Energy Commission staff requested via electronic mail confirmation/clarification of the Applicant's response to Data Request 169. Below are the staff's requested data and the Applicant's response.

**Request 1:** In Data Request Set 7, Traffic and Transportation, Data Request #169, Table DR169-1 AEC Combined-Cycle Air Cooled Condenser Thermal Plume Information included length and width dimensions for the cell diameter. Do you have the dimension of the fan diameter in the cell as shown in Figure 2.1-2? Also the Outlet Air Velocity numbers provided appear to be much lower than what would be expected. Please confirm the numbers and units provided in the table are accurate.

**Response:** After review by the project engineering staff, Table DR169-1R (below) provides the revised outlet air velocity values, based on a fan diameter of 36 feet. Boldface text notes revised values.

**Table DR169-1R AEC Combined-Cycle Air Cooled Condenser Thermal Plume Information**

Parameter	Air Cooled Condensers			
Number of Cells	7 x 5 = 35			
Cell Height (ft)	Air Inlet: 53.1 (from grade), Fan Deck: 58.2 (from grade), Total Height: 97.2 (from grade), Cell Height: 39.0 (97.2 - 58.2)			
Cell Diameter (ft)	43.9 (L) x 42.1 (W)			
<b>Fan Diameter (ft)</b>	<b>36</b>			
Distance Between Cells (ft)	0 ft (adjoining cells share a single column)			
Ambient Temperature (°F)	28	65.3	107	107
Ambient Relative Humidity (%)	76	87	11	11
Evaporative Cooler	Off	Off	Off	On
Number of Cells in Operation	13	35	33	33
Heat Rejection (MW/hr)	369.6	378.8	369.7	388.9
Steam Exhaust Temperature (°F)	101.1	102.4	142.8	144.6
<b>Outlet Air Exit Velocity (ft/s)</b>	<b>6.17</b>	<b>15.87</b>	<b>14.83</b>	<b>14.83</b>
Outlet Air Temperature (°F)	89.2	88.6	135.8	137.1
°F = degrees Fahrenheit ft = feet ft/s = feet per second MW/hr = megawatts per hour				

**Request 2:** In Data Request Set 7, Traffic and Transportation, Data Request #169, Table DR169-2 AEC Simple-Cycle Fin Fan Cooler Thermal Plume Information included several parameters. Similar to Huntington Beach, calculating the heat rejection using the outlet air flow provided does not match the heat rejection provided in the Table for the 65.3F and 107F cases. In addition, the flow rate and exit velocities do not appear to correspond for all three cases. Please review and confirm the accuracy of the data provided and provide vendor data sheets (similar to the additional data provided for Huntington Beach).

**Response:** The AEC Simple-Cycle fin-fan cooler exit velocity is based on the tube bundle openings, not the fan diameter. Attached are the Air-Cooled Heat Exchanger Specification Sheets for the average ambient and high ambient conditions. The average ambient condition data sheet shows an air flow per fan (see the data under the heading Performance Data - Air Side) of 181,661 cubic feet per minute per fan (CFM/fan) or 3,027.7 cubic feet per second per fan (CFS/fan) and the tube bundle dimensions of 13.990 feet (ft) by 60.0 ft. The exit velocity was calculated using the following equation:

$$\text{Fan Velocity} \times \text{Number of Fans/Bundle Dimensions} = 3,027.7 \text{ CFS} \times 3 \text{ fans} / (13.990 \text{ ft} \times 60.0 \text{ ft}) = \text{approximately } 11 \text{ feet per second (ft/s)}$$

Table DR169-2R (below) presents the revised information for the AEC Simple-Cycle fin-fan coolers. Boldface text notes revised values.

**Table DR169-2R AEC Simple-Cycle Fin Fan Cooler Thermal Plume Information**

Parameter	AEC Simple Cycle Fin Fan Coolers		
Number of Cells (Fans)	60 total, 20 bays (3 fans per bay)		
Cell Height (ft)	32		
Cell Diameter (ft)	12		
Distance Between Cells (ft)	<b>1'-3"</b>		
Ambient Temperature (°F)	28	65.3	107
Ambient Relative Humidity (%)	76	87	11
Number in Operation	24 fans	60 fans	60 fans
Heat Rejection (MW/hr)	65.3	65.3	65.7
Outlet Air Temperature (°F)	<b>75.11</b>	<b>84.06</b>	<b>114.3</b>
Outlet Air Exit Velocity (ft/s)	<b>~10.9</b>	<b>~11.0</b>	<b>~12.0</b>
Outlet Air Flow (lb/hr)	<b>19,674,564</b>	<b>49,186,410</b>	<b>49,186,410</b>

If you have any questions about this matter, please contact me at (916) 286-0207.

Sincerely,

CH2M



Jerry Salamy  
 AFC Project Manager

Attachments

cc: S. O’Kane, AES  
 J. Harris, ESH