

DOCKETED

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Project Title:	Alamitos Energy Center
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Document Title:	Data Request Set 8 (170-175)
Description:	Energy Commission Staff's Data Request Set 8 (Nos. 170-175) on Transmission System Engineering
Filer:	Christopher Meyer
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CALIFORNIA ENERGY COMMISSION

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February 12, 2016

Stephen O'Kane
AES Southland, LLC
690 Studebaker Road
Long Beach, CA 90803

Regarding: **ALAMITOS ENERGY CENTER (13-AFC-01)**
DATA REQUESTS SET 8 (No. 170-175)

Dear Mr. O'Kane,

Pursuant to Title 20, California Code of Regulations, section 1716, the California Energy Commission staff requests the information specified in the enclosed data requests. The information requested is necessary to: 1) more fully understand the project, and 2) assess whether the facility will be constructed and operated in compliance with applicable regulations. These data requests (Nos. 170-175) on the Supplemental Application for Certification (SAFC) are being made in the technical area of Transmission System Engineering and are based on the revised responses to Data Requests 160, 161 and 163, filed by AES on February 8, 2016. Written responses to the enclosed data requests are due to the Energy Commission staff on or before March 11, 2016.

If you are unable to provide the information requested, need additional time, or object to providing the requested information, please send a written notice to the Committee and me within 20 days of receipt of this request. The notification must contain the reasons for the inability to provide the information or the grounds for any objections (see Title 20, California Code of Regulations, section 1716 (f)).

If you have any questions regarding the enclosed data requests, please call me at (916) 654-4640.

Sincerely,

/ Original Signed /

Christopher Meyer, Siting Project Manager
Siting, Transmission and Environmental
Protection Division

Enclosure (Data Request Packet)
cc: Docket (13-AFC-01)

ALAMITOS ENERGY CENTER
(13-AFC-01)

Energy Commission Staff's Data Requests Set 8 (Nos. 170-175)

February 12, 2016

**Alamitos Energy Center (13-AFC-01)
Data Requests**

Technical Area: Transmission System Engineering

Author: Ajoy Guha, P. E. and Mark Hesters

BACKGROUND

Staff has had discussions with Mr. Robert Sims, an engineering consultant for AES, about draft responses to Transmission System Engineering data requests (Data Requests 160-166 from Energy Commission Staff's Data Request Set #6, filed November 30, 2015). The discussions were primarily focused on the completeness of the draft data responses; however, staff did have some concerns about specific equipment proposed by the applicant that will be documented both through this data request and a separate report of conversation. AES docketed its revised responses to staff's Data Requests 160, 161 and 163 on February 8, 2016. The discussion below is in response to this February 8, 2016 filing. There is still some missing data in the response and staff is concerned that some of the specific equipment is not appropriately sized for the generators. Data Request 166 (the California ISO exemption letter) has not been provided and is still outstanding.

The proposed switchyard equipment is designed for a generator operating between 0.90 lag to 0.95 lead but the generator itself can operate to 0.85 lag. CAISO Tariff 8.2.3.3 indicates the minimum requirement of the Power Factor (PF) of a generator in the ISO system is 0.90 lag to 0.95 lead, but the tariff also states that the CAISO could set a different requirement of the PF during operation which could go from 0.85 lag to 0.95 lead, as stated in the Huntington Beach Energy Project LGIA. The proposed design would meet the minimum requirements, but the proposed generators are rated for 0.85 PF (associated with operation at 0.85 lag). It would be appropriate, and consistent with standard safe practices, to design the switchyard equipment on the basis of 0.85 PF, which would increase the current in the switchyard circuits and the generation tie (gen-tie) lines, requiring higher rated equipment.

Staff is concerned about the proposed conductor in Figure 3.1-R for the gen-tie lines. The proposed aluminum conductor, steel supported (ACSS) conductor is not used very often and then for short reconductoring projects. The ratings for the ACSS conductor are based on 200 degrees Celsius where most of the equipment and other conductors have ratings based on 75 degrees Celsius. This means the proposed conductors would be operating at higher temperature than other equipment in order to accommodate the output of the proposed generator which could affect the reliability of the other equipment. Aluminum Conductor Steel Reinforced (ACSR) is the standard conductor used for transmission and gen-tie lines; ACSR is rated based on 75 degree Celsius operation.

**Alamitos Energy Center (13-AFC-01)
Data Requests**

DATA REQUESTS

170. Please provide current ratings of the Disconnect Switches in the Switching bays of the SCE 230 kV Alamitos Switching Station.
171. In Power Block 1, please provide:
 - a. The high side bus size, type and Ampere ratings,
 - b. The length, size and type of the short overhead conductor between the high side of the generator step-up (GSU) transformer and the 230 kV switchyard bus.
172. In Power Blocks 2a and 2b, please provide:
 - a. The high side bus size and type, Ampere ratings,
 - b. The length, size and type of the short overhead conductor between the high side of the GSU transformer and the 230 kV switchyard bus.
173. Figure 3.1-1R and Figure DR161-1R are not consistent. Figure 3.1-1R shows four power blocks, 2a, 2b, 2c and 2d, connecting separately to the bus. Figure DR161-1R shows blocks 2a and 2b connecting as a pair to the bus and 2c and 2d connecting as a pair to the bus. Please provide consistent drawings.
174. Given the discussion above and the high operating temperature ACSS conductor proposed in Figure 3.1-1R, please explain the choice of the ACSS conductor for the gen-tie line and why a more standard ACSR conductor was not chosen.
175. Many of the circuit breakers and all of the Step-up transformers are not rated highly enough to allow the generators to operate at their rated 0.85 power factor.
Based on the equipment ratings provided in Figure 3.1-1R:
 - a. Please explain the choice of underrated equipment or redesign the switchyard and gen-tie lines with equipment that would allow the generators to operate at their rated 0.85 power factor (0.85 lag). If the switchyard is redesigned, resubmit all of the diagrams with the new equipment and the associated equipment ratings.
 - b. The 9,000 Amp, 18 kV Circuit Breaker 1 (CB1) in the Power Block No. 1 switchyard would not allow the STG to operate at its rated 0.85 PF.
 - c. In Power Block 1, the Generator Step-up (GSU) transformers for the CTG 1 and CTG 2 generators are rated at 270 MVA. The CTGs are rated 234.5 MW, 0.85 PF. In order to accommodate the generators the GSU transformers should be rated at least 276MVA.
 - d. In the Power Blocks 2a and 2b, the highest rating of each transformer is 120 MVA while the generators would require a transformer with at least a 122 MVA rating in order to operate at a 0.85 power factor.
 - e. In Power Block 1, the 230 kV breaker, CB1 and associated disconnect switch are rated at 2,000 Amps. In order to accommodate generators at 0.85 PF, the ratings of the 230 kV breaker and the disconnect switch should be at least 2,100 Amps.