

DOCKETED

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Sent: Friday, August 29, 2014 12:23 PM
To: Steve.Moore@sdcounty.ca.gov; Horres, Nicholas
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Cc: Tom W. Andrews
Subject: Amended CECP - Gas Turbine Heat Rates
Attachments: CECP_GT_Heat_Rates.pdf

Steve/Nick:

In response to the SDAPCD's recent request for the heat rates for larger F and H class machines in simple-cycle mode, we have gathered the enclosed summary of heat rates based on information available on the vendor websites. In addition to the F and H class machines, we also included the heat rates for some smaller machines. As shown on the enclosed table, the heat rate for the GE LMS 100s proposed for the Amended CECP is at the lower end of these heat rates. Please let us know if you have any questions.

Tom Andrews

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Table A1 Heat Rates for Simple-Cycle Gas Turbines Amended CECP				
Gas Turbine Make/Model	Maximum Gross Output Simple-Cycle Mode ISO Conditions (MW)	Heat Rate LHV, Gross ISO Conditions (Btu/kw-hr)	Heat Rate HHV, Gross (2) ISO Conditions (Btu/kw-hr)	Notes
Siemens SGT6-PAC 5000F	232	8,794	9,750	1
Siemens SGT6-2000E	114	9,949	11,030	3
GE 7HA (7HA.02)	331	8,224	9,117	4, 7
GE 7FA (7F.05)	227	8,663	9,604	4, 7
GE 7FA (7F.04)	187	8,832	9,792	4, 7
GE LM6000-PF™ Sprint	47	8,170	9,058	5
Rolls-Royce Trent 60 WLE DF ISI (water injected)	66	8,303	9,205	6
Amended CECP GE LMS 100PA	109	7,947	8,811	8

Notes:

1. General technical data found on the following link:

<http://www.energy.siemens.com/hq/en/fossil-power-generation/gas-turbines/sgt6-5000f.htm#content=Technical%20data>

2. Conversion of heat rates from LHV to HHV based on the ratio of natural gas heating values for the CECP site (GE CECP site fuel specs of 1018.2 Btu/scf HHV vs. 918.4 Btu/scf LHV).

3. General technical data found on the following link:

<http://www.energy.siemens.com/hq/en/fossil-power-generation/gas-turbines/sgt6-2000e.htm#content=Technical%20data>

4. General technical data obtained from the following link ("Explore Gas Turbines" tab):

<https://powergen.gepower.com/plan-build/products/gas-turbines/explore-gas-turbines.html>

5. From LM6000 Aeroderivative Product and Services Brochure found on the following link:

<https://www.ge-distributedpower.com/products/power-generation/35-to-65mw/lm6000-sprint-series>

6. General technical data found on the following link ("Engine Performance" tab):

http://www.rolls-royce.com/energy/energy_products/gas_turbines/trent_60/

7. The maximum rating increased from ISO net to ISO gross output based on a typical gas turbine only auxiliary load of 0.2% of net output (typical turbine only auxiliary load provided by NRG engineering).

8. This is based on a GE performance run at 60.3 deg. F (not at 59 deg. F ISO ambient condition). See May 8, 2014 Application for an Authority to Construct for the Amended CECP submitted to the San Diego APCD, Appendix 5.1B, Table 5.1B-2, Case 100. Please note that on May 13, 2014, Carlsbad Energy Center LLC ("Project Owner") filed at the California Energy Commission a copy of this document (TN 202326).

<https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=07-AFC-06C>