

DOCKETED

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STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:

Petition For Amendment for the
**PALEN SOLAR ELECTRIC
GENERATING SYSTEM**


DOCKET NO. 09-AFC-07C

**DECLARATION OF BRUCE
KELLY**

I, Bruce Kelly, declare as follows:

1. I am presently employed by Abengoa Solar LLC as a Senior Engineering Advisor.
2. A copy of my professional qualifications and experience was included with my Supplemental Opening Testimony and is incorporated by reference in this Declaration.
3. I prepared the attached supplemental rebuttal testimony relating to Overriding Considerations for the Petition for Amendment for the Palen Solar Electric Generating System (California Energy Commission Docket Number 09-AFC-07C).
4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.
5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on July 16, 2014.



Bruce Kelly

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:

Petition For Amendment for the
**PALEN SOLAR ELECTRIC
GENERATING SYSTEM**

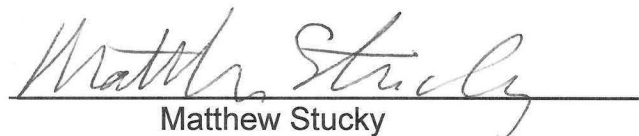
DOCKET NO. 09-AFC-07C

**DECLARATION OF MATTHEW
STUCKY**

I, Matthew Stucky, declare as follows:

1. I am presently employed by Abengoa Solar LLC as Manager of Business Development.
2. A copy of my professional qualifications and experience was included with my Opening Testimony and is incorporated by reference in this Declaration.
3. I prepared the attached supplemental rebuttal testimony relating to Overriding Considerations for the Petition for Amendment for the Palen Solar Electric Generating System (California Energy Commission Docket Number 09-AFC-07C).
4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.
5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on July 17 2014.


Matthew Stucky

**PALEN SOLAR ELECTRIC GENERATING SYSTEM
OVERRIDING CONSIDERATIONS
SUPPLEMENTAL REBUTTAL TESTIMONY**

I. Names:

Bruce Kelly
Matthew Stucky

II. Purpose:

Our supplemental rebuttal testimony addresses a specific question contained in Staff's Opening Testimony about the potential for Thermal Energy Storage (TES) for the Palen Solar Electric Generating System (PSEGS) (09-AFC-7C).

III. Qualifications:

Our qualifications have been summarized and resumes included in previously filed written testimony in this proceeding.

To the best of our knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are our own. We make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Opinion and Conclusions:

It is clear from Staff's Supplemental Opening Testimony that the CEC Staff recognizes the value of TES in allowing PSEGS to sustain output capacity through reduced solar conditions and ensure maximum output capacity during hours of high demand. However, based on a number of statements within Staff testimony, it appears that there may be a misunderstanding of the design intent of the storage addition concept for PSEGS.

The storage addition is intended for the time-shifting of electric energy delivery. For example, if wholesale market prices favor electric energy production late in the day, rather than early in the day, the normal morning startup time of the steam turbine could be delayed to allow thermal energy from the SRSG to be supplied to the storage system. Then, late in the afternoon, the storage system would be discharged to supplement the steam supplied by the SRSG to the turbine, or in some cases provide the steam entirely. An operating mode, in which storage is charged at the same time as the turbine operating at its Maximum Continuous Rating (MCR), is not anticipated. As such, the addition of the storage system will

not influence the number of heliostats in service, the incident thermal power supplied by the heliostat field to the SRSG, the thermal output or the steam mass flow rate of the SRSG, the peak metal temperatures of the absorber tubes in the SRSG, or the projected fatigue life of the SRSG.

Below are select excerpts from Staff's Supplemental Rebuttal Testimony followed by PSH responses which are intended to further clarify the intent of the storage concept.

Exhibit 2017, Page 68: "In this TES scenario, the petitioner assumes that the PSEGS solar system would be able to provide full MCR power production, or 270 MW gross, while charging the molten salt storage tanks to their full capacity."

Response: It is not the intent of the design to provide full MCR power production while simultaneously charging the molten salt storage tanks. Instead, a portion of the steam flow would be diverted upstream of the steam turbine generator and instead be used to charge the storage system. The added flexibility of the storage system allows the operator to defer immediate electricity production in favor of generation at a later time. This decision to defer production until later would likely be in response to energy market pricing signals.

Exhibit 2017, Page 71: "...staff remains unclear if the SRSG, as currently designed can handle the thermal energy resulting from all of the heliostats required to produce the MCR of 270 MW while fully recharging the TES system."

Response: As CEC Staff has implied here, the SRSG is the primary component which limits energy received from the solar field. PSH does not intend to increase the current design capacity of the SRSG, nor is it practical to increase the SRSG capacity at a date after the construction of the plant. For these reasons, the future storage addition would serve the purpose of time-shifting of energy delivery, not increasing the net energy generated by the plant.