

## Stakeholder Comments Template

### Subject: Multi-Stage Generating Unit Modeling

Submitted by	Company	Date Submitted
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Pacific Gas & Electric Company (PG&E) appreciates the opportunity to participate in the Multi-Stage Generating Unit Modeling stakeholder process and to submit comments regarding the November 7, 2008 Issue Paper and the November 14, 2008 Presentation.

In general, PG&E is supportive of the initiative's objective of more accurately incorporating the operating parameters of multi-stage generating units so that the units will be economically and feasibly dispatched.

1. Please describe the operational issues that you believe modeling of multi-stage units can alleviate.

PG&E anticipates three primary operational benefits resulting from implementation of this initiative:

- i. Elimination of burdensome operational work-arounds (e.g., SLIC ticket to transition though forbidden region),
  - ii. Straight-forward representation of multi-stage units in bids instead of kludging units into a monotonically non-decreasing bid curve, and
  - iii. Better utilization of multi-stage units and reduction in market costs by reflecting true operational flexibility in optimization.
2. If you participate in other ISO/RTO markets where multi-stage units are modeled, please provide any insights you have gained from that experience.

PG&E does not have any specific suggestion. However, we encourage the CAISO to survey the six other RTOs/ISOs to determine how they have solved this problem so we can leverage their experiences. We would like to see a discussion of this in the straw proposal.

## PG&E Comments for Multi-Stage Generating Unit Modeling Initiative

3. What issues do you anticipate arising due to modeling of multi-stage units? Please provide detail and/or examples.

In the stakeholder call, PG&E asked about the difficulty of significantly increasing generating unit modeling capabilities while maintaining the needed algorithm performance. This concern is based on the CAISO's experience with modeling the much less robust forbidden region functionality which resulted in serious performance issues. Our understanding from the conference call is that the CAISO plans to represent unit characteristics in the multi-stage modeling as integer variables instead of continuous value variables, and this will assist in maintaining system performance. PG&E suggests that the CAISO keep stakeholders apprised of the validity of that assumption as the initiative progresses.

4. Which of the two models – pseudo-plant or pseudo-unit – discussed in the conference call would you prefer to see implemented and why?

Based on the CAISO description, it seems the Pseudo-plant Model offers the most advantages. PG&E would like more detailed information about the advantages and disadvantages of the two approaches in the straw proposal, including more discussion and perhaps an example of the treatment of pseudo-unit varying costs.

5. Other comments.

None.