Gateway Generating Station (00-AFC-1C)
Petition to Allow Use of Anhydrous Ammonia in Inlet Chiller
Power Plant Efficiency Analysis

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INTRODUCTION

Pacific Gas and Electric Company (PG&E) has petitioned to modify the gas turbine inlet air chiller system to utilize anhydrous ammonia as a refrigerant, replacing the R134A refrigerant currently approved for use.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

No LORS apply to the efficiency of the Gateway Generating Station.

ANALYSIS

On August 1, 2007, the Energy Commission approved PG&E's petition to amend the project to replace the evaporative cooling tower system for steam turbine condenser cooling with an air-cooled condenser system. Included in that amendment was replacement of the evaporative gas turbine inlet air cooling system with mechanical chillers utilizing R134A refrigerant.

As detailed design of the chiller system has progressed, PG&E evaluated various alternative refrigerants:

- R134A
- R22
- propylene
- anhydrous ammonia

Ammonia is commonly utilized in such chillers, and has a long track record of effectiveness. Ammonia offered the greatest efficiency, up to 300 percent as great as with R134A and significantly greater than with the other alternatives. An ammonia chiller would be sufficiently more effective than one using any of the other refrigerants to allow a significantly smaller system to achieve the desired cooling effect.

CONCLUSIONS AND RECOMMENDATIONS

The requested modification would allow PG&E to operate the Gateway Generating Station more efficiently. The modification would result in favorable impacts on power plant efficiency. No conditions of certification are proposed. This recommendation is based on the following:

1. I have analyzed the proposed change from the standpoint of Power Plant Efficiency, and conclude there will be no new or additional significant adverse impacts to efficiency associated with this action.
2. I conclude that the amendment is based on new information that was not available during the siting proceedings or during previous amendment proceedings.
3. I conclude that the proposed modification retains the intent of the original Commission Decision.