

UPDATE ON REVISED ACTION PLAN FOR SAN FRANCISCO

BACKGROUND

Following a wide-spread power outage in 1998 within San Francisco and the Peninsula, the San Francisco Stakeholder Study Group (SFSSG) was formed to develop a reliable long-term load-serving plan that would minimize the recurrence of such an outage. A key outcome from the group was the recommendation to install the Jefferson-Martin 230 kV Line Project, which was approved by the CAISO in April 2002. This project added approximately 400 MW of load serving capability to the San Francisco-Peninsula region. The project became operational in April 2006.

Over the course of several years, the City and County of San Francisco (“CCSF”), Pacific Gas and Electric Company (“PG&E”), and the ISO have worked closely to identify new transmission and generation projects that would provide for a reliable long-term San Francisco power supply. Currently, reliably serving load in San Francisco relies on transmission and relatively old generation resources that have not always been available when needed. A recent and unexpected outage of the 210 MW Potrero Unit #3 in November 2006 and again in January 2007 illustrates this situation where reliance was placed on the Potrero Combustion Turbine units (CT’s) to be available on short notice when needed. These CT’s have not been as reliable as required and they are only permitted for 870 (10% of the year) hours.

ISO Management first presented an Action Plan (see Appendix 1) to the ISO Governing Board on September 15, 2004, that identified a combination of 14 transmission projects and four new peaking generation units that are required to allow for the release of the existing Hunters Point Power Plant (Units 1 & 4 totaling 213 MW) and the Potrero Power Plant (Units 3, 4, 5, & 6 totaling 357 MW) from their Reliability Must-Run (RMR) contracts. In response to a request that CCSF made during the September 15, 2004 Board Meeting, Management revised the Action Plan to release Potrero Unit 3 from its RMR contract with installation of the proposed new CCSF peaking generation units. These new peaking units were expected to be operational before four PG&E transmission projects would and therefore facilitate non-reliance on Unit #3 a year sooner than with the initial Action Plan. In November 2004, the CAISO approved the Revised Action Plan for San Francisco (see Appendix 2).

Projects required to release the Hunters Point Power Plant included the Jefferson – Martin 230 kV Line, the Potrero – Hunters Point 115 kV Line and implementation of Emergency Ratings for some of the 115 kV cables in San Francisco. All required projects have been completed and the Hunters Point Power Plant was released from RMR requirements by the CAISO and retired by PG&E in May 2006.

The second portion of the Action Plan is related to the Potrero Power Plant. Projects required for this portion include four PG&E transmission projects, the proposed CCSF San Francisco Electric Reliability Project (comprised of three combustion turbine (CT) generating units sited near Potrero Substation) and a 4th CT proposed by CCSF to be sited near the SF Airport. In addition, there is a project to install a 3rd Martin-Hunters Point 115 kV cable that was meant to replace utilization of emergency ratings for four of the existing 115 kV cables in SF, but is now required in addition to the emergency ratings until the Trans Bay HVDC Cable Project is in operation (early 2010). One of four PG&E transmission projects is complete, one will be by May 2007 and the remaining two by December 2007. The CCSF project near Potrero received CEC approval of their Application For Certification (AFC) on October 3, 2006, and is now forecast to be operational in early 2009. The 3rd Martin-Hunters Point 115 kV Cable Project is also scheduled for operation

in early 2009. Based on the projected completion dates for these projects, the release of the Potrero Power Plant Units #3, 4, 5, & 6 from their RMR contracts is projected to occur by 2010.

As presently planned, all of the items within the Action Plan are required to be completed for it to end as intended with removing reliance on the existing Potrero Power Plant generating units. Completion of only part of the Action Plan will not support mitigation of reliance on any of the existing Potrero generating units for maintaining reliability within the San Francisco transmission system. Although the Trans Bay HVDC Cable Project is not part of the Action Plan, it is the vital transmission project that will maintain long-term reliable load-serving capability after successful conclusion of the Action Plan. The Action Plan is currently projected to be completed in early 2009 and the Trans Bay HVDC Cable Project in early 2010. Based on both meeting transmission planning requirements and real-time system operation requirements, all of the items in the Action Plan and the Trans Bay HVDC Cable project are needed as presently scheduled to maintain reliable load-serving capability within the San Francisco transmission system (see Appendix 3).

The Action Plan is based on assumptions that are subject to change such as has occurred with the replacement of RMR by Locational Capacity Requirements (LCR), where LCR is more consistent with transmission planning and real-time system operations in maintaining reliability. Other assumptions supporting the Action Plan include current and expected status of transmission projects, available generation, and customer load demand. Any significant change to the assumptions underlying the ISO's analysis could change the ISO's conclusions. If such significant changes do occur, the ISO is obligated to review the continued acceptability of this Action Plan.

Appendices:

1. Initial Action Plan Board Memo
 - Attachment 1 - CAISO Action Plan Project List
 - Attachment 2 - Action Plan for Release of Existing Hunters Point and Potrero Generation from RMR Contracts
 - Attachment 3 – Analysis of Options to the Retrofit of Potrero 3
 - Attachment 4 – Discussion of Potrero 3 Retrofit
 - Attachment 5 – What is RMR, and Why are Hunters Point and Potrero Units Under RMR Contracts
2. Revised Action Plan ISO Board Memo
 - Attachment 1 - CAISO Revised Action Plan Updated Project List
3. San Francisco Load Serving Capability Discussion
 - Attachment 1 - San Francisco Internal Transmission System Diagram

Appendix 1



To: ISO Board of Governors
From: Marcie Edwards, Interim CEO
CC: ISO Officers; Board Assistant
Date: September 10, 2004

Re: Action Plan for San Francisco, Options and Risks
This memorandum does no require Board action.

Purpose of Memo

This is in response to questions about the electric infrastructure of San Francisco that came up at the Board of Governor's July 29, 2004 meeting. This memo provides analysis and recommendations as to:

- The Action Plan for release of PG&E owned generation at Hunters Point and Mirant owned generation at Potrero from ISO Reliability Must Run (RMR) Agreements,
- An analysis of the retrofit of the Potrero 3 Power Plant with emissions control technology and how that impacts the Action Plan, and
- A discussion of the reliability of Hunters Point Unit 4 and the appropriateness of its designation as a RMR generation unit.

Action Plan to Release Hunters Point and Potrero from their RMR Agreements – An Action Plan acceptable to the ISO for release of the existing generation at Hunters Point and Potrero from RMR contracts involves successful completion of a total of 12 transmission projects by PG&E, four peaking power plants by the City, and the Mirant retrofit of Potrero 3 with emissions control technology for its temporary operation. The ISO does not control the dates of completion of these projects, nor does it control the permanent shutdown of the Hunters Point and Potrero generation.

The action plan acceptable to the ISO for the shut down of Hunters Point and Potrero units is based on assumptions that are subject to change. Such assumptions include current and expected status of transmission, generation, and customer demand. Any significant change to the assumptions underlying our analysis may change our conclusions. If such significant changes do occur, the ISO is obligated to review the continued acceptability of this action plan.

To release Hunters Point and Potrero Generation from their RMR Agreements requires the following:

- **Hunters Point 2 and 3**
Completion of one transmission project – scheduled for completion by PG&E in December 2004. These units are recommended to be released from their RMR Agreements in September 2004 for the 2005 RMR Year.
- **Hunters Point 1 and 4**
Completion of seven transmission projects and the retrofit of Potrero 3 – the final project (Jefferson – Martin) is scheduled for completion sometime between December 2005 and March 2006. Therefore, these units are planned to be recommended for release from the RMR Agreements in September 2005 for the 2006 RMR Year.
- **Potrero 4, 5, 6**
Completion of Peaking Power Plants by City – the scheduled completion is December 2006. Therefore, these units are planned to be recommended for release from their RMR Agreements in September 2006 for the 2007 RMR Year.
- **Potrero 3**
Completion of four transmission projects and assuming previous completion of the Peaking Power Plants referenced above – PG&E is currently evaluating the project completion dates, but believes they are likely to

be scheduled for 2007. Were this to occur, the ISO would plan to recommend this unit for release from its RMR Agreement in September 2007 for the 2008 RMR year.

(See Attachment 1 for a list of the projects and Attachment 2 for a detailed discussion of the Action Plan.)

The Action Plan is based on compliance with regional and national requirements. Those standards also include the Greater Bay Area Generation Outage Standard adopted by the Board as a result of rolling blackouts initiated in the San Francisco Bay Area on June 14, 2000 to protect against the potential for voltage collapse.

Analysis of Retrofit of Potrero 3 with Emission Control Technology – The Action Plan for the release of all Hunters Point generation from RMR contracts assumes Potrero 3 is retrofitted with emission control technology. Potrero 3 would then operate cleaner until it can be released from its RMR contract, assuming all needed projects are completed. The retrofit, with an estimated cost in excess of \$20 million (cost information provided by Mirant), is deemed necessary to ensure there is sufficient generation to serve customer load consistent with power system planning criteria. Further, the retrofit of Potrero 3 is viewed as a superior option when taking into consideration air quality and cost.

Timely completion of the retrofit is now in question - Potrero 3 is a 206 MW power plant. Without a retrofit, its air permit will limit its output to 140 MW provided its emissions are offset by cleaner emissions from other SCR retrofitted units owned by Mirant that are located within the NOx bubble. These units include Pittsburg Units 5 and 6 and Contra Costa Unit 7. Studies show that this “non-retrofit” option increases the costs to PG&E’s ratepayers (an additional \$30M per year) and increase NOx emissions (by up to 1,150%).

The Action Plan for release of Hunters Point currently includes the retrofit of Potrero 3. The “non-retrofit” alternative provides less of a cushion for continued reliable operation of the San Francisco grid and, as stated, will increase cost and emissions (See Attachment 3 and 4 for supporting discussion). Throughout these discussions, the ISO has communicated its position on the Potrero retrofit to all interested parties.

At the September 15, 2004 ISO Board of Governor’s meeting, the Board will be asked to approve the slate of RMR units for the 2005 Year. As stated previously, staff is recommending that Hunters Point Units 1 & 4 continue as RMR units for the 2005 Year until the projects that support their removal from RMR status have GLD & JKG 9/10/2004 -3- been completed. All units at Potrero are being recommended for RMR status for the 2005 Year as well, given that none of the projects to support their release have been completed.

In addition, note that in the 2005 RMR Board Action item, staff has recommended that Pittsburg 6 continue as RMR for the 2005 calendar year. This is to allow forward movement with the projects needed to ultimately release both Hunters Point and Potrero from RMR given the assumption that a retrofit of Potrero 3 might be delayed indefinitely. Understand that air quality limitations affecting Potrero 3 will cause the unit to be limited to 140 MW in 2005 and remote generators will be required to operate at their maximum in order to meet air quality limits. In order to keep the unit running under its new air quality limitations beyond 2005, Unit 3 will continue to be limited to 140 MW and remote generators will continue to be required to operate at their maximum in order to meet air quality limits. So, without the Potrero 3 retrofit, Option 2, (See Attachment 3) is the automatic default. Potrero generation, meaning the existing CT’s and some portion of Unit 3 are needed in order to release Hunter’s Point from their RMR agreements; a fact which the ISO has long made plain.

Reliance on Hunters Point Unit 4 to Maintain Reliability – This is in response to the Board inquiry into how the historical availability of a generating unit factors into the ISO RMR analysis.

The historical availability of a generating unit is not explicitly factored into the analysis. Instead, the RMR analysis assumes only one generating unit is out at any one time. So Hunters Point 4 is assumed available and operating when any other generating unit is not.

When there is a pool of generation that is available, we seek the selection of units that are the more reliable. However, all the generation in the City is needed, so we do not have the ability to be selective. Since 2000, the availability of Hunters Point 4 has been above 60% in all but one year.

ISO grid planning studies, RMR studies, and operational studies confirm that Hunters Point 1 & 4 and Potrero 3, 4, 5, and 6 are required in order for customers in SF and SF/Peninsula NOT to be subjected to possible blackouts in 2005 stemming from a violation of planning criteria. The ISO, therefore, will recommend the re-designation of Hunters Point 4 (as well as Hunters Point Unit 1 and the Potrero units) as 2005 RMR units.

Attachment 1:

CAISO Action Plan for San Francisco

PG&E Transmission Projects and City Peaking Power Plants Necessary

To Meet NERC/WECC/CAISO Planning Requirements

	Project	Estimated Completion Date/Status	Issue	Resolution of Issue
Release Hunters Point Units 2 & 3 From Their RMR Agreements				
1	Potrero Static VAR Compensator	Dec 2004	NERC/WECC/CAISO Planning Standards	This project allowed meeting planning requirements with Hunters Point Power Plant Units 2 and 3 released from their RMR Agreement
Release Hunters Point Units 1 & 4 From Their RMR Agreements				
2	San Mateo-Martin No. 4 Line Voltage Conversion	Completed	NERC/WECC/CAISO Planning Standards	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
3	Ravenswood 2 nd 230/115 kV Transformer Project	Completed	NERC/WECC/CAISO Planning Standards	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
4	San Francisco Internal Cable Higher Emergency Ratings	Completed - Effective on completion of Jeff-Martin 230 kV Line Project	NERC/WECC/CAISO Planning Standards	These ratings are an interim solution that in combination with the other listed projects allows PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreements. In 2007, a third Martin-Hunters Point 115 kV cable will replace the emergency ratings.
5	Tesla-Newark No. 2 230 kV Line Reconductoring	May 2005	RMR Criteria	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
6	Ravenswood-Ames 115 kV Lines Reinforcement	May 2005	RMR Criteria	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
7	San Mateo 230 kV Bus Insulator Replacement	May 2005	Requirement During San Mateo Bus Wash	Eliminate bus wash at San Mateo 230 kV bus will reduce the 400 MW generation operational requirement down to less than 200 MW

8	Potrero-Hunters Point (AP-1) 115 kV Cable	Dec 2005	NERC/WECC/CAISO Planning Standards	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement. Scheduled for Dec. 2005 operation.
9	Jefferson-Martin 230 kV Line	Dec 2006 to March 2006	NERC/WECC/CAISO Planning Standards	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
10	Potrero 3 SCR retrofit	February 2005	NERC/WECC/CAISO Planning Standards	This project ensures the availability of Potrero 3 at full capacity thereby reducing overall Greater Bay Area RMR requirements. This project or the reduced capacity available without the retrofit in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreements
Release Potrero Units 4, 5, & 6 From Their RMR Agreements				
11	San Francisco Electric Reliability Project and San Francisco Airport Electric Reliability Plant	December 2006	NERC/WECC/CAISO Planning Standards	These projects will allow ISO/PG&E to meet planning requirements with Potrero 3 released from its RMR Agreement.
Release Potrero Unit 3 From Its RMR Agreements (assumes CCSF CT's on-line)				
12	Upgrade the Newark-Dumbarton 115 kV line	May 2006	NERC/WECC/CAISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement
13	Upgrade the Bair-Belmont 115 kV Line	May 2007	NERC/WECC/CAISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement
14	Upgrade the Metcalf-Hicks & Metcalf-Vasona 230 kV lines	May 2007	NERC/WECC/CAISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement
15	Add voltage support at Ravenswood substation	May 2007	NERC/WECC/CAISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement

Attachment 2

Action Plan for Release of Existing Hunters Point and Potrero Generation from RMR Contracts

Background

The mission of the California Independent System Operator (ISO) is to plan and operate the ISO control area safely and reliably. The ISO sets its reliability standards in compliance with regional and national requirements (Western Electricity Coordinating Council and North American Electric Reliability Council, respectively). We also apply standards that have been developed by the California ISO Planning Standards Committee for application to the ISO control area. The ultimate goal of these standards is to ensure continuous supply of electricity and to avert the risk of blackouts.

The ability to reliably provide electricity to the San Francisco Peninsula Area¹ is based on three critical "load serving" conditions:

1. There is sufficient power to serve the electric needs of customers in local areas;
2. The transmission system is capable of delivering that power to the local area where it is distributed to customers;
3. Power System operators can perform routine equipment maintenance and continue to reliably serve customers even after certain equipment failures occur.

The Action Plan to release existing Hunters Point and Potrero generation from RMR contracts identifies the transmission and generation infrastructure necessary to meet the applicable national, regional, and ISO reliability standards. The dates set forth in this memo are based on expected completion dates and were provided by Pacific Gas and Electric Company (PG&E), the City and County of San Francisco (City) and Mirant who are the entities responsible for completing the transmission and generation projects. PG&E and Mirant are the owners of Hunters Point and Potrero Power Plants, respectively, and control the subsequent shutdown of the power plants.

In 1998, the City entered into an agreement with PG&E to close the Hunters Point Power Plant (Hunters Point) as soon as it is released from the Reliability Must Run Agreement (RMR Agreement). To that end, in approving the Jefferson Martin transmission line, the ISO Board of Governors provided the directive to the ISO to work with the City and County of San Francisco and interested stakeholders with the goal of closing Hunters Point.

Over the past several years and continuing here, the ISO is fulfilling its mission by working with representatives of the City, PG&E, and the Potrero and Hunters Point/Bayshore communities to facilitate appropriate investment in electric transmission and generation infrastructure that will maintain the reliability of the electric system while they pursue the shutdown of existing generation within the City.

PG&E and the ISO jointly developed the list of reliability upgrades needed to establish a clear transmission plan to release all of Hunters Point generation from RMR contracts (refer to Attachment 1). It is important to note that the ISO cannot decommission the generation facilities; the ISO will release the Units from their RMR Agreements and PG&E as the plant owner is responsible for the decommissioning process.

Hunters Point Detail

By the end of 2004, PG&E will have completed the one project necessary to allow the release of Hunters Point Units 2 & 3 from their RMR Agreements. The project is the Potrero Static VAR Compensator that will provide enough voltage support for the San Francisco Peninsula Area to displace the need to continue operating Hunters Point Units 2 & 3, which are currently operated as synchronous condensers. However, ISO management will request the re-

¹ In the testimony for the Jefferson-Martin Transmission Line, approved by the California Public Utilities Commission on August 19, 2004, the ISO refers to the City and County of San Francisco and the San Francisco Peninsula as the "San Francisco Peninsula Area." For clarity in this memo, the ISO will delineate separately, when necessary, the City, the Peninsula, and the Greater Bay Area even though the City is included in the Peninsula, which is included in the Greater Bay Area.

designation of Hunters Point Units 1 & 4 for the 2005 Contract Year, given that the projects to support the removal of the RMR agreement are not yet completed.

The release of Hunters Point 1 & 4 from RMR obligations are conditioned on completion of the noted transmission projects and the retrofit of Potrero 3. PG&E has continued to move towards completing all of their transmission projects by the end of 2005. And with the recent approval of the Jefferson – Martin 230kV line by the CPUC, the way has been cleared for the last remaining piece of transmission infrastructure to be in-service by the end of 2005 or the first quarter of 2006. Therefore, the continued operation of Hunters Point Units 1 & 4 through 2005 is necessary to serve customer demand for power and provide operational support until those transmission projects are completed. The ISO's current plan is to recommend that the ISO Board of Governors release Hunters Point Units 1 & 4 from their RMR agreements at the September 2005 Board meeting for the 2006 Contract Year.

Potrero Detail

The ISO has determined that generation located in the City will remain critical to the long-term ability to serve load in the San Francisco Peninsula Area. Therefore, following the retirement of Hunters Point, the retirement of any existing Potrero generation requires an equivalent offset of new transmission and/or generation infrastructure. The only new generation currently being proposed is by the City through their San Francisco Electric Reliability Project (SFERP) and the San Francisco Airport Electric Reliability Plant (SFAERP). The SFERP proposes to install three new 48 MW combustion turbines at the existing Potrero Power Plant site and the SFAERP proposes to install one 48 MW combustion turbine at the San Francisco International Airport. The City proposes to have these two projects (collectively the "CT Project") in-service by the end of 2006. Completion of the San Francisco Electric Reliability Project will allow for the release of Potrero Units 4, 5, and 6 from RMR obligations. The current plan is to recommend that the ISO Board of Governors release Potrero 4, 5, and 6 from their RMR agreements at the September 2006 Board meeting for the 2007 Contract Year.

PG&E and ISO have tentatively agreed to evaluate additional transmission projects and the addition of voltage support to achieve the release of Potrero 3 from its RMR obligations. The completion date of these projects is to be determined, but PG&E indicates they are likely to be scheduled for 2007. We will continue to keep the Board of Governors apprised of the progress of this effort. As with the release of other projects from RMR obligations, we expect to release Potrero 3 when the last of these projects are completed.

DC Cable Detail

A High Voltage Direct Current line (DC Cable) capable of carrying 400-600 MW has been proposed by Trans Bay Cable LLC (an affiliate of Babcock & Brown LP). This DC Cable would run between the City of GLD & JKG 9/10/2004 -8- Pittsburg and the Potrero Substation in San Francisco. This DC Cable is tentatively scheduled for operation by summer 2008. At this time, the proposed DC Cable is an alternative to augment long-term load serving capability for the San Francisco Peninsula area. In deciding on a preferred long-term alternative to serve load beyond 2007, the reliability and economic aspects of the proposed project will be considered and compared to PG&E reinforcing the existing transmission system or building a new 230 kV line to increase power imported into the San Francisco Peninsula.

Attachment 3

Analysis of Options to the Retrofit of Potrero 3

(Based on current ISO 2005 RMR analysis which includes Hunters Point Units 1 & 4)

▪ **Option 1: Potrero 3 available; retrofitted (ISO Preferred Approach)**

- Load shedding exposure: None
- RMR Exposure
 - Release Pittsburg 6 (clean and expensive)
 - Release Pittsburg 7 (dirty and expensive)
- Operational exposure
 - Increased use of other generating facilities (clean and less expensive than Pittsburg 6)
- Cost exposure
 - Information released by Mirant puts the retrofit costs at approximately \$20M.
- Environmental exposure
 - The emissions from Potrero Unit 3 are reduced by 80% (reduction of one ton NOx/day). In other words, a retrofitted Potrero 3 only emits 15 lbs/hour

▪ **Option 2: Potrero 3 available; not retrofitted; operated at reduced level.**

- Load shedding exposure: None
- RMR exposure
 - Continue to RMR Pittsburg 6 (clean and expensive)
 - Simultaneously run Pittsburg 5 & 6 and Contra Costa 7 at their maximum in order to operate Potrero 3 up to 140 MW (Overall NOx bubble requirement)
- Operating exposure
 - Reduced use of remote generating resources that are cleaner and less expensive than Pittsburg 6, given that the Pittsburg 5 & 6 and Contra Costa 7 must run as RMR units. In short, other less expensive/cleaner options will have to be backed down.
- Cost exposure
 - Additional \$30,000,000/year (additional RMR costs incurred by retaining units under RMR that would have otherwise been released if Potrero 3 was retrofit.)
- Environmental exposure
 - Total lbs/hour of NOx increase by 108 to 172 lbs/hour or from 700% to 1,150% over Option 1 emissions

▪ **Option 3: Potrero 3 not available (Note: This option violates planning criteria and is provided simply to outline the associated risks.)**

- Load exposure
 - San Francisco Peninsula Area load shedding could be required; up to 50 to 100 MW
 - Up to 30-70 hours per year
- RMR Exposure
 - Continue to RMR Pittsburg 7 (dirty and expensive)
 - Continue to RMR Pittsburg 6 (clean and expensive)
- Cost Exposure
 - Additional cost of \$100,000,000 - \$120,000,000/year (additional RMR costs incurred by retaining units under RMR that would have otherwise been released if Potrero 3 was retrofit.)
- Operating exposure
 - Does not meet NERC/WECC or MORC Standards
 - Simultaneously run Pittsburg 5 & 6 and Contra Costa 7 at their maximum in order to operate Pittsburg 7 (Overall NOx bubble requirement)
 - Reduced use of other generation (clean & less expensive than Pittsburg 6)
- Environmental exposure
 - Total lbs/hour of NOx increase by 175 to 239 lbs/hour or 1,166% to 1,593% over Option 1 emissions.

Attachment 4

Discussion of the Potrero 3 Retrofit

Key Study Assumptions in Creating a Potrero Retirement Plan

The retrofit of Potrero 3 continues to be part of the Action Plan to release Hunters Point from its RMR contract. The retrofit is to install emission control technology that will allow the unit to operate at its current 207 MW capacity. Potrero 3 will operate cleaner until it is shut down after the projects listed in Attachment 1 are completed.

The ISO was asked to evaluate the release of Hunters Point from its RMR obligations in early 2003. We responded in a letter to the City dated April 18, 2003 that outlined a plan for the retirement of Hunters Point 4 and identified the Potrero 3 retrofit as part of the plan. We have reiterated our support for the retrofit in subsequent 2003 and 2004 correspondence. We also encouraged the timely completion of the City's combustion turbine project, the Jefferson-Martin transmission project, and other PG&E transmission projects.

Since our initial discussions, PG&E's Jefferson-Martin transmission project and the City's combustion turbine project have been delayed to early and late 2006, respectively. A description of the legal challenges to the Potrero retrofit follows.

Challenge to Potrero Retrofit

On July 14, 2004, an appeal was filed with the San Francisco Board of Appeals challenging the granting of permits by the Planning and Building Departments that are necessary for the retrofit of Potrero Unit 3. The filing of an appeal in San Francisco stays the permit, and Mirant has been unable to proceed with any work on their retrofit. This has changed the outage schedule for this unit and alters the sequenced and interdependent outages coordinated in this area for both generation and transmission. In addition, a lawsuit has been filed at the San Francisco Superior Court on September 2, 2004, challenging the Bay Area Air Quality Management District's approval of the SCR for Potrero Unit 3. These actions have already delayed the retrofit of Potrero Unit 3 at a minimum, and could result in Potrero Unit 3 not being retrofitted as originally contemplated in the ISO's previous plans. In order to proceed with the analysis, staff felt that several alternative approaches must be assessed to outline for the Board the available options and the consequences associated with the operation of Potrero Unit 3 both with and without the retrofit. Following is a discussion of the options in detail (Attachment 3).

Operation of Potrero Unit 3 With and Without the Retrofit for 2005

Anticipating that the retrofit of Potrero Unit 3 could not be achieved in 2005, ISO Staff has assessed the opportunity to continue to operate Potrero Unit 3 without the proposed SCR retrofit. The continued operation of Potrero Unit 3 without an SCR retrofit is possible, provided its emissions are offset by cleaner emissions from other SCR retrofitted Mirant units located within the Bay Area NOx bubble. At present, Mirant owns Potrero as well as generation units at Pittsburg and Contra Costa. Pittsburg Units 5 and 6 and Contra Costa Unit 7 have already been SCR retrofitted and more than meet the NOx requirements for 2005 and beyond. Potrero Unit 3 could continue to be operated at a reduced level of 140 MW, provided GLD & JKG 9/10/2004 -12- Pittsburg Units 5 and 6 and Contra Costa Unit 7 are run concurrently to meet Mirant's overall Bay Area NOx limit requirement. With Mirant running the Pittsburg and Contra Costa units that have combined emissions less than allowed by the 2005 standard, "room" within the NOx Bubble is created to operate Potrero Unit 3 at a reduced level. This level of generation is projected to be sufficient to meet San Francisco Peninsula Area reliability requirements in 2005, provided Hunters Point Units 1 and 4 remain available through 2005 or until all the identified transmission projects are placed in-service.

Release of Potrero Units 4, 5, and 6 from the RMR Agreement

The ISO has determined that generation located in the City will remain critical to the long-term ability to provide the capacity and energy needed to serve load in the San Francisco Peninsula Area. Therefore, following the retirement of Hunters Point, the retirement of any existing Potrero generation requires an equivalent offset of new transmission and/or generation infrastructure. The only new generation currently being proposed is by the City through their San Francisco Electric Reliability Project (SFERP) and the San Francisco Airport Electric Reliability Plant (SFAERP). The SFERP proposes to install three new 48 MW combustion turbines at the existing Potrero Power Plant site and the SFAERP proposes to install one 48 MW combustion turbine at the San Francisco International Airport. The City proposes to have these two projects (collectively the "CT Project") in-service by the end of 2006. The ISO has determined that the CT Project will provide the needed capacity and energy required to replace the older Potrero combustion turbine units and to continue the forward

movement needed to ultimately release Potrero Unit 3 from its RMR Agreements. Therefore, once the CT Project is placed in-service, the ISO will release Potrero Units 4, 5, and 6 from their RMR Agreement.

Release of Potrero Unit 3 From the RMR Agreement

At the present time, the ISO assumes that the City's electric reliability projects will replace the existing Potrero combustion turbine Units 4, 5, and 6. Unfortunately, the load serving capability that the City's generation projects provide to the San Francisco Peninsula Area is approximately 40 MW greater than the 150 MW of existing combustion turbine generation it replaces, falling short of the Area's projected electric growth that is expected to occur during this time frame if Potrero Unit 3 were also retired.² As such, additional transmission facilities beyond those already identified for retiring Hunters Point are needed to not only make up this shortfall, but also provide additional load serving capacity many years into the future.

ISO Staff supports transmission system reinforcements to allow for reliable electric system operation with the Potrero Unit 3 released from its RMR contract. This involves reinforcement of the existing transmission system through mitigating certain transmission line overloads that are projected to occur under contingency conditions and adding the necessary voltage support to account for the impacts of increased imported power into San Francisco. The transmission overloads that need to be addressed before Potrero Unit 3 can be retired are listed in Attachment 1. ISO Staff has discussed these transmission overloads with PG&E and requested them to assess and determine the appropriate transmission projects for relieving them. Until PG&E has had an opportunity to conduct an in-depth review, these transmission needs and their corresponding transmission projects, identifiable in-service dates cannot be accurately determined; however, PG&E indicates that they are likely to be scheduled for 2007. PG&E has agreed to include all of these upgrades in their 2005 transmission expansion assessment. 2 San Francisco reached a new peak on September 7, 2004 of 931 MW. This number represents the peak forecast for 2006 (936 MW) and it is already being reached in 2004. GLD & JKG 9/10/2004 -13- Notwithstanding PG&E's final review of these transmission requirements, the ISO hopes that the necessary transmission upgrades could be in place as soon as possible to allow for the retirement of Potrero Unit 3 at the earliest possible time. To this end, the ISO remains committed to a continued and positive working relationship with PG&E towards the timely completion of these necessary transmission upgrades.

² San Francisco reached a new peak on September 7, 2004 of 931 MW. This number represents the peak forecast for 2006 (936 MW) and it is already being reached in 2004.

Attachment 5

What is RMR, and Why are Hunters Point and Potrero Units Under RMR Contracts

Over the years, many generation and transmission expansion projects were built to serve the increasing consumer load growth. These projects were integrated with the facilities that preceded them. In many cases, certain generation-related components, in whole or in part, complement transmission-related components. For example, generation-related components complement the transmission grid in several ways; providing voltage support, reducing heavy power flows on certain transmission lines, and minimizing the oscillatory nature of the electric system, among others. In these situations, generation and transmission facilities are interdependent in maintaining grid reliability such that changes in either could have a detrimental impact on the acceptable performance and operation of the interconnected transmission grid.

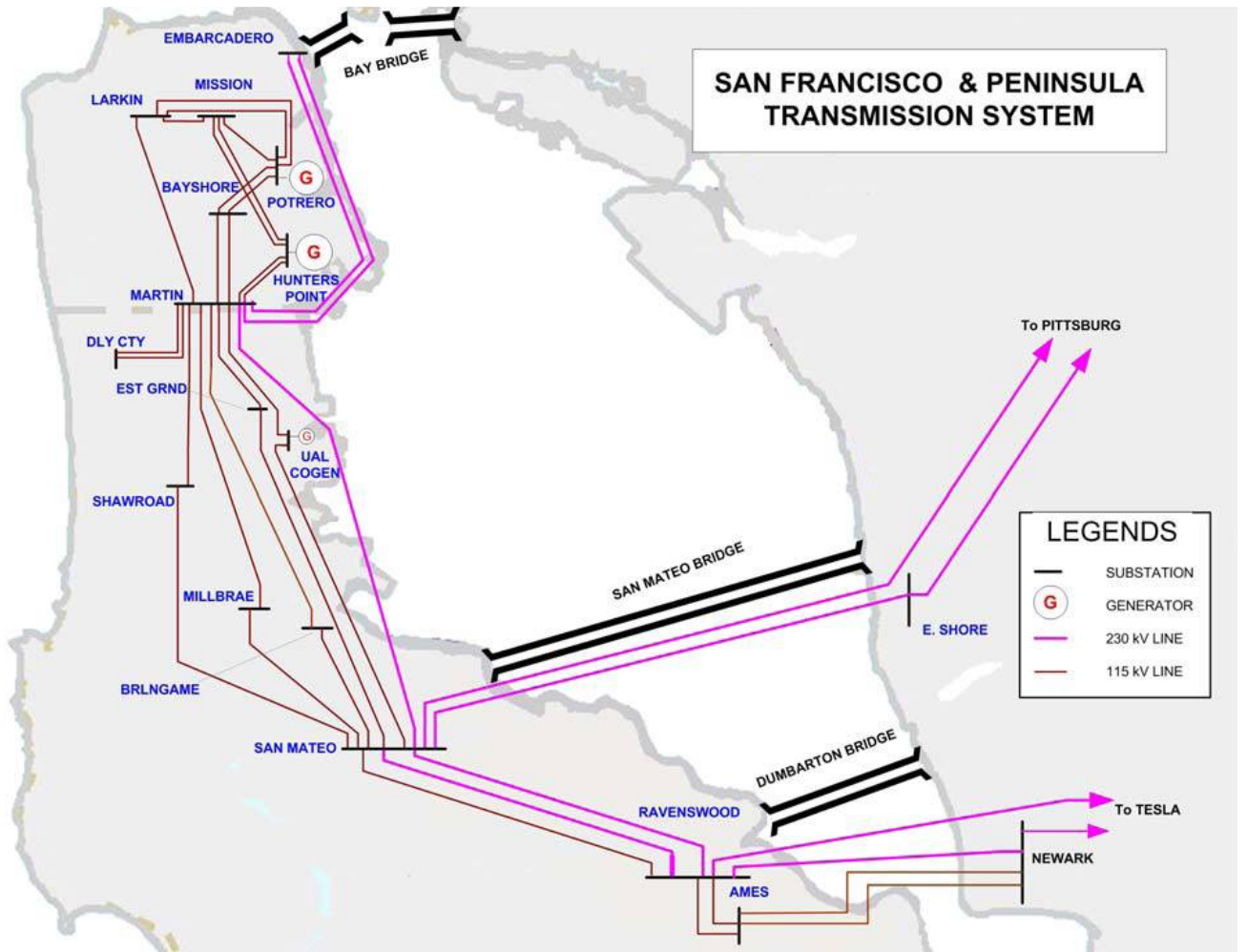
Prior to the restructuring of the electricity market in California, generation was owned and operated by the investor owned utilities and was operated as an integral part of the utilities interconnected transmission grid in a manner to reliably serve their load. Because some generation is located in critical local areas, its dispatch was required, sometimes uneconomically, to meet the system's reliability needs. California's restructured electric market allowed for the majority of the generation owned by investor owned utilities to be sold to third parties. With this change in ownership, generator owners were not obligated to run their generator units in this manner and the CAISO did not have the ability to achieve this must-run requirement without a contracted requirement. As a result of this change, Reliability Must Run ("RMR") was established where generation can be dispatched by the CAISO to primarily assure local area reliability needs are met and local area load can be reliably served³ and secondly to mitigate the local market power that owners can exercise. In short, an RMR designation of any generation facility is to simply say that a set of power system conditions can exist in a particular geographic area that can only be remedied by localized support from a specific generator.

The San Francisco Peninsula Area is a local area Reliability Must-Run sub-area that is considered in the ISO's annual RMR assessment. This is a sub-area within the Greater Bay Area local RMR area. The San Francisco Peninsula Area is generally represented by PG&E's service territory running north from Ravenswood substation (in the vicinity of the City of Palo Alto) and including the City and County of San Francisco ("San Francisco"). The ability to serve electric load in this area is impacted by not only generation and transmission facilities within this area, but also transmission facilities connecting from the Greater Bay Area.

Two key generation facilities for serving load within the San Francisco Peninsula, Hunters Point and Potrero, are located within the city of San Francisco. They are currently under RMR contract for 2004 and are being re-designated for an RMR contract for 2005. For 2004, RMR generation at Hunters Point and Potrero is mainly determined by an outage of the Tesla – Metcalf 500kV line and the Delta Energy Center. The system limitation that determines the amount of RMR generation is the resulting loading on the Tesla – Newark #2 230kV line. As a result of the 2004 RMR designation, PG&E proposed to upgrade the Tesla – Newark #2 230kV line to mitigate this overload and to assist in addressing the need to RMR generation at Hunters Point. The ISO accepted PG&E's proposal and PG&E included the project in their 2004 Transmission Expansion Plan as a transmission RMR project for completion by May 1, 2005.

The 2005 RMR process has been completed and ISO staff will again recommend the re-designation of all generator units at Hunters Point and Potrero Power Plants except Hunters Point Units #2 & #3. Units #2 & #3 have been operating as synchronous condensers for the last three years where they have only been supplying needed voltage support. They will be replaced by a Static Var Compensator currently under construction at Potrero Substation and scheduled for operation in December 2004. For 2005, the amount of required RMR generation for San Francisco is determined by an outage of the Newark – Ravenswood 230kV line and Potrero Unit 3. The system limitation that determines the amount of required RMR generation is the loading on the Newark – Ames 115kV lines. These lines are part of the 230 and 115 kV lines over which power is imported into the San Francisco Peninsula area.

³ **Reliability Must-Run Generation** - Generation that the ISO determines is required to be on line to meet Applicable Reliability Criteria requirements. This includes i) Generation constrained on line to meet NERC and WECC reliability criteria for interconnected systems operation; ii) Generation needed to meet Load demand in constrained areas; and iii) Generation needed to be operated to provide voltage or security support of the ISO or a local area.



Appendix 2



To: ISO Board of Governors
From: Marcie Edwards, Interim CEO
CC: ISO Officers; Board Assistant
Date: November 5, 2004

Re: Board Endorsement of Revised Action Plan for San Francisco
This memorandum requires Board action.

EXECUTIVE SUMMARY

The purpose of this memo is to seek Board endorsement of the Revised Action Plan for San Francisco ("Revised Action Plan") to release existing generation located within the City of San Francisco from Reliability Must Run ("RMR") Agreements with the ISO.

Management recommends that the Board adopt the following motion:

MOVED,

That the ISO Governing Board approves the Revised Action Plan attached to the memorandum dated November 5, 2004. Furthermore, the ISO Governing Board directs Management to forward said Revised Action Plan to the parties ultimately responsible for implementing the projects identified in the Revised Action plan, indicating that the ISO Governing Board fully endorses the Revised Action Plan.

BACKGROUND

Original Action Plan – The reliability of the San Francisco power supply relies on old power plants that are coming to the end of their useful life. Over the course of several years the City and County of San Francisco ("City"), Pacific Gas & Electric ("PG&E") and the ISO have worked closely to identify new transmission and generation projects that can be used both to replace the existing generation and maintain the reliability of the San Francisco power supply. On September 10, 2004 you were provided an Action Plan that listed a combination of 14 transmission projects and 4 peaking power plants that allow the sequential shutdown of the existing generation.

On September 14, 2004 the ISO received a letter from the City seeking clarification of the need for the retrofit of Potrero 3 power plant and inquiring about the feasibility of changing the sequence of the shutdown of the Potrero power plants. The City also spoke to the same matters during the September 15, 2004 Board meeting.

Revised Action Plan – On October 27, 2004 the ISO informed the City that Potrero 3 could be released from its RMR contract before Potrero 4, 5, and 6. This Revised Action Plan remains conditioned on the completion of the 14 PG&E transmission projects and the 4 City peaking power plants, as well as continued compliance with national and state reliability criteria. **Attachment 1** sets forth the list of transmission and generation projects that comprise the Revised Action Plan. Other than switching the order in which Potrero units are planned to be released from RMR, (and that adjustment was made at the request of the City of San Francisco) the action plan otherwise remains unchanged from the one that was provided to the Board at the September 15, 2006 Board meeting. **Attachment 2** contains a letter responding to questions raised by the City of San

Francisco and information regarding forecasted capability of the local electric infrastructure, as well as zones of risk associated with maintaining electric system reliability.

Members of the community as well as representatives from Citizens for a Better Environment (CBE) seek the Board's endorsement of the Revised Action Plan as assurance that the ISO will make a good faith commitment to the plan. Management considers this an important gesture of the ISO 's intent and is therefore supportive of that commitment.

Management also takes this opportunity to commend the City and PG&E for the steps each have taken to identify and advance these and future infrastructure projects and looks forward to their continued efforts in these areas.

MANAGEMENT RECOMMENDATION

Management recommends that the Board approve the Revised Action Plan and direct Management to forward such approved action plan to the parties responsible for developing the projects identified in the plan. Management commits to regularly update the Board on the parties' progress in implementing the Revised Action Plan.

MOVED,

That the ISO Governing Board approves the Revised Action Plan attached to the memorandum dated November 5, 2004. Furthermore, the ISO Governing Board directs Management to forward said Revised Action Plan to the parties ultimately responsible for implementing the projects identified in the Revised Action Plan, indicating that the ISO Governing Board fully endorses the Revised Action Plan.

The motion as stated below was revised and approved by the CAISO Board of Governors.

The ISO Board of Governors has reviewed and adopts the following Action Plan for San Francisco and directs Management to undertake the ISO's responsibilities under the plan in a manner that will allow for implementation of this Action Plan on the earliest practicable schedule. Management is further directed, subject to any change in the circumstances under which the plan has been developed, to release each generating unit from its RMR contract obligations at the earliest date that Management finds that the conditions under the plan for such release have been met, or alternative projects with equal or greater reliability benefits satisfying applicable criteria have been released for operation.

Attachment 1:
CAISO Revised Action Plan for San Francisco
 PG&E Transmission Projects and City Peaking Power Plants Necessary
 To Meet NERC/WECC/CAISO Planning Requirements as of January 2007

Project	Estimated Completion Date/Status	Issue	Resolution of Issue
Release Hunters Point Units 2 & 3 From Their RMR Agreements			
1	Potrero Static VAR Compensator Completed	NERC/WECC/CAISO Planning Standards	This project allowed meeting planning requirements with Hunters Point Power Plant Units 2 and 3 released from their RMR Agreement
Release Hunters Point Units 1 & 4 From Their RMR Agreements			
2	San Mateo-Martin No. 4 Line Voltage Conversion Completed	NERC/WECC/CAISO Planning Standards	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
3	Ravenswood 2 nd 230/115 kV Transformer Project Completed	NERC/WECC/CAISO Planning Standards	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
4	San Francisco Internal Cable Higher Emergency Ratings Completed	NERC/WECC/CAISO Planning Standards	These ratings are an interim solution that in combination with the other listed projects allows PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreements. In early 2009, a third Martin-Hunters Point 115 kV cable will significantly reduce reliance on using the emergency ratings.
5	Tesla-Newark No. 2 230 kV Line Reconductoring Completed	RMR Criteria	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
6	Ravenswood-Ames 115 kV Lines Reinforcement Completed	RMR Criteria	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
7	San Mateo 230 kV Bus Insulator Replacement Completed	Requirement During San Mateo Bus Wash	Eliminate bus wash at San Mateo 230 kV bus will reduce the 400 MW generation operational requirement down to less than 200 MW
8	Potrero-Hunters Point (AP-1) 115 kV Cable Completed	NERC/WECC/CAISO Planning Standards	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement. Scheduled for Dec. 2005 operation.

9	Jefferson-Martin 230 kV Line	Completed	NERC/WECC/CAISO Planning Standards	This project in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreement
10	Potrero 3 SCR retrofit	Completed	NERC/WECC/CAISO Planning Standards	This project ensures the availability of Potrero 3 at full capacity thereby reducing overall Greater Bay Area RMR requirements. This project or the reduced capacity available without the retrofit in combination with the other listed projects allows ISO/PG&E to meet planning requirements with Hunters Point Power Plant Units 1 and 4 released from their RMR Agreements
Release Potrero Unit 3 From Its RMR Agreement				
11	San Francisco Electric Reliability Project and San Francisco Airport Electric Reliability Plant	Have been approved by the CEC & are expected on-line in early 2009	NERC/WECC/CAISO Planning Standards	These projects will allow ISO/PG&E to meet planning requirements with Potrero 3 released from its RMR Agreement.
Release Potrero Units 4, 5, & 6 From Their RMR Agreements (assumes CCSF CT's on-line)				
12	Upgrade the Newark-Dumbarton 115 kV line	Completed	NERC/WECC/CAISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement
13	Upgrade the Bair-Belmont 115 kV Line	May 2007	NERC/WECC/CAISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement
14	Upgrade the Metcalf-Hicks & Metcalf-Vasona 230 kV lines	December 2007	NERC/WECC/CAISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement
15	Add voltage support at Ravenswood substation	December 2007	NERC/WECC/CAISO Planning Standards	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet planning requirements with Potrero Units 4, 5, and 6 released from their RMR Agreement

Appendix 3

San Francisco Load Serving Capability Discussion

I. Current System

Attachment 1 is a single-line diagram of the San Francisco internal transmission system as planned by 2010. Power flow studies show that the Load Serving Capability (LSC) of the current San Francisco Internal Transmission System is 990 MW. Based on the latest load forecast for San Francisco (see Table 3), the current transmission system would be able to reliably serve the projected load in San Francisco up to year 2011 (see Table 1). It is important to note that this ability to serve load does not take into account completion of the CAISO Revised Action Plan for San Francisco and therefore reducing available generation in San Francisco from 357 MW to 192 MW (includes the CCSF proposed CT near the SF Airport). This also does not take into account the continuing issues with reliability of the existing Potrero generator units. They continue to demonstrate a propensity for a simultaneous outage of two units. With this assumption, projects such as the new CT's proposed by CCSF and the Trans Bay HVDC Cable Project (TBC) are needed as presently scheduled by 2009 and 2010 respectively (see Section II below).

Facility	Status	L-1/G-1		N-1-1	
		LSC	SF-Gen	LSC	SF-Gen
Potrero PP	Not Retired	990 MW	150 MW	1025 MW	357 MW
3 rd Martin-Hunters Cable	Not Installed				
Emer. Ratings	Implemented				
TBC	Not Installed				

Table 1 – SF LSC for Current System Configuration

II. Potrero Retirement and TBC Project Consideration

Power flow studies were also performed to determine the effects of Potrero PP retirement with the CCSF peakers installed, the 3rd Martin-Hunters Point Cable Project, and the proposed TBC Project on the SF LSC. In summary, Table 2 shows that, with Potrero PP retired and the CCSF peakers installed, the current system LSC would reduce to 768 MW (Row # 2). This is well below the current 2009 forecasted load for San Francisco of 969 MW. With Potrero PP retired, the 3rd Martin – Hunters Point Cable Project would be needed in 2009 to support the San Francisco system load until TBC is operational in 2010 (Row #1). Without the TBC operational as scheduled in 2010, there will be insufficient LSC to support the load projected for 2011. It is important to note that adhering exactly to the numbers in the table allows no margin for unexpected issues that could materialize in real-time operation, therefore, continued reliable operation is predicated on present scheduled operation dates. Table 2 also shows that with TBC operational and the 3rd Martin-Hunters Point Cable Project, the LSC increases beyond 2016 loads, based on N-1-1 criteria, as well as increasing the LSC based on L-1/G-1 criteria, with or without the use of the emergency ratings.

Row #	TBC	Potrero PP	3rd Martin - Htrs.Pt Cable	115 kV SF cable Emer. Ratings	L-1/G-1		L-1-1	
					LSC (MW)	SF-Gen (MW)	LSC (MW)	SF-Gen (MW)
1	No	Retired	Installed	Yes	1063	96	983	144
1A	No	Retired	Installed	Yes	967	0	839	0
2	No	Retired	No	Yes	904	96	768	144
3	Yes;L-1	Retired	No	Yes	1291	96	981	144
4	Yes;L-1	Retired	Installed	Yes	1383	96	1163	144
5	Yes;L-1	Retired	Installed	No	1226	96	1040	144

Table 2 – SF LSC with TBC and Potrero Retirement Considered

III. San Francisco Load Forecast

Year	Peak Demand Forecast - MW (Based in 1-in-10 High Temperature)
2006	937
2007	954
2008	960
2009	967
2010	976
2011	988
2012	997
2013	1007
2014	1015
2015	1024
2016	1032

Table 3 – SF Load Forecast

Proposed Trans Bay HVDC Cable Project

Attachment 1:
Single Line Diagram
Proposed San Francisco 115kV Underground Cable System in 2010

