Feasibility/Updating Facilities Study II

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Generation Interconnection

City and County of San Francisco

San Francisco Electric Reliability Power Project

Pacific Gas and Electric Company

WE DELIVER ENERGY.

June 8, 2005

Table of Contents

1. Executive Summary 1
2. Project Information and Interconnection Plan 1
3. Cost Summary & Schedule 3
   - 3.1 Direct Assignment Facilities 4
   - 3.2 Network Upgrades Costs 4
   - 3.3 Tentative Construction Schedule 5
4. Study Assumptions 5
5. Substation Evaluation 5
   - 5.1 Direct Assignment Work 5
   - 5.2 Network Upgrades 6
6. Transmission Line Evaluation 6
7. Land Evaluation / Environmental Evaluation/ Permitting 6
   - 7.1 CPUC General Order 131-D 7
8. Study Updates 8
9. Stand-by Power 8

Appendices

A. **Workscope**

1. Executive Summary

The City and County of San Francisco (CCSF) proposes to interconnect a new gas turbine generating facility to Pacific Gas & Electric's (PG&E's) Potrero 115 kV Switchyard. The project is called the San Francisco Electric Reliability Power Project (SFERPP). The proposed project will consist of three LM6000 units rated 50.5 MW each. The net output of the proposed project will be 145.1 MW. The on-line date of the proposed project is June 2007. A Facilities Study Report for the SFERPP was issued March 19, 2004. CCSF has proposed a new site and interconnection plan for the SFERPP. The new site is approximately 0.3 miles away from the original site and the proposed new interconnection to Pacific Gas & Electric Company's (PG&E's) transmission grid will be via two new 115 kV underground generation tie lines. Each of the two new 115 kV underground lines is capable of transmitting the full 145.1 MW of SFERPP to the PG&E's transmission grid. The original proposed generation tie lines were overhead. Both California Independent System Operator (CAISO) and PG&E agreed that a Feasibility Study was needed to determine if routing two redundant underground 115 kV circuits into Potrero Substation from the new SFERPP site would be feasible. If the underground transmission was determined to be feasible, an updating Facilities Study II would be required.

This Feasibility/Updating Facility Study II (F/UFS) determined that

- routing the two underground 115 kV circuits into Potrero Substation from the new SFERPP site is feasible[1],

and provides

- cost estimates and work scope for the facilities necessary to interconnect the SFERPP to PG&E's grid.

The cost of the direct assignment facilities to interconnect the project would be approximately **$3.1 million**, exclusive of ITCC[2].

The cost for the network upgrades to interconnect the project would be approximately **$1.4 million**, exclusive of ITCC.

2. Project Information and Interconnection Plan

Table 2-1 provides general information about the San Francisco Electric Reliability Power Project.

Project Location	Illinois and 25th, San Francisco (see Figure 2-1)
PG&E Planning Area	Area 7 (San Francisco)
Number and Type of Generators	3 - LM6000 Gas Turbines

[1] SFERPP needs to show separation of its cable facilities from PG&E's cable facilities so that PG&E's cable facilities would not be derated.
[2] Income Tax Component of Contribution

Maximum Generator Output	151.5 MW
Generator Auxiliary Load	6.4 MW
Maximum Net Output to Grid	145.1 MW
Power Factor	85% (Lag) – 95% (Lead)
Description Of Interconnection Configuration	All units connect to PG&E's Potrero 115 kV Switchyard
Connection Voltage	115 kV

Table 2-1: Project General Information

The proposed project consists of three (3) LM6000 gas turbines. Each LM6000 gas turbine is rated at 50.5 MW, 85% (lag) – 95% (lead) power factor. Each generator will have a 13.8/115 kV step-up transformer. All three LM6000 units connect to PG&E's Potrero 115 kV Substation from the SFERPP site as shown in Figure 2-1.

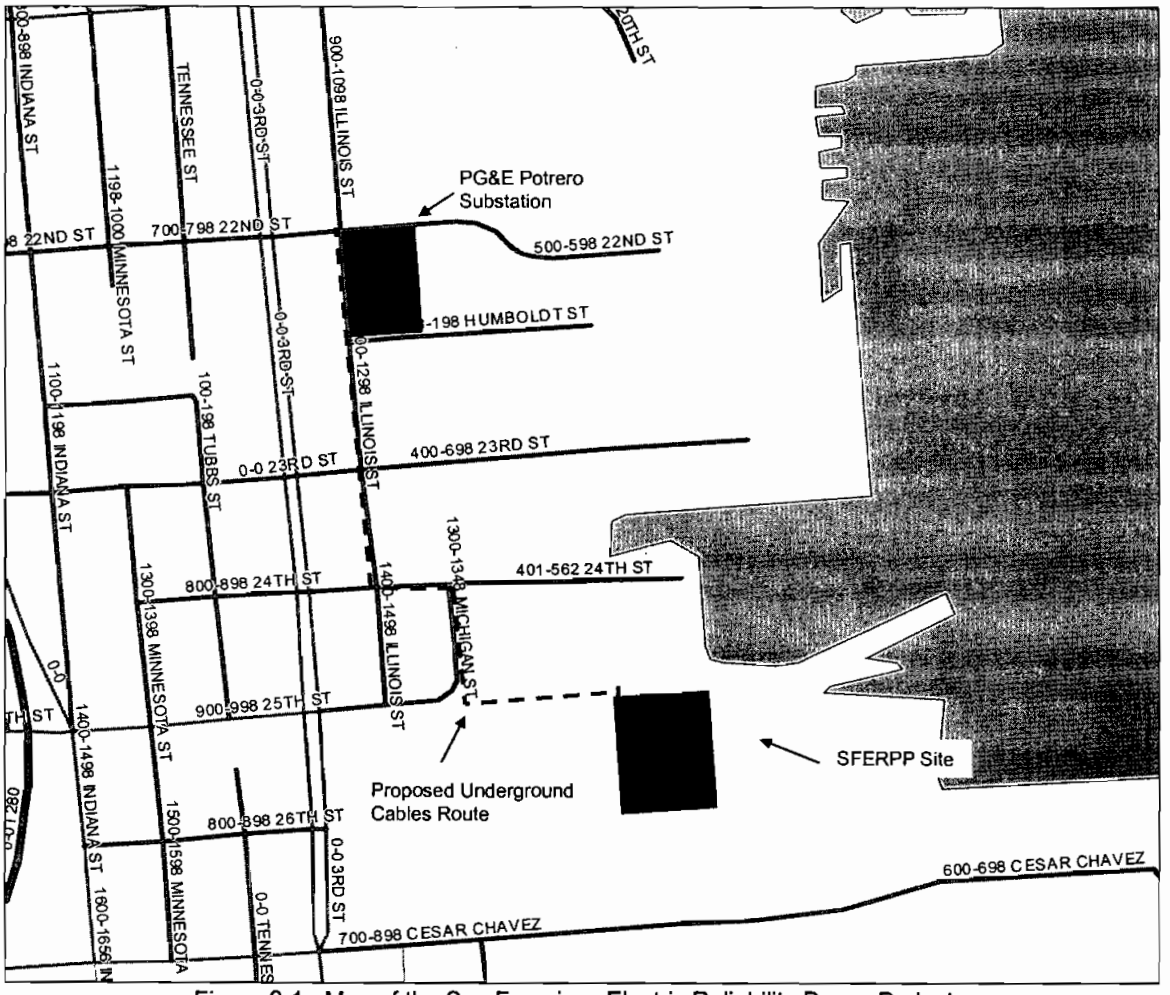

Figure 2-1: Map of the San Francisco Electric Reliability Power Project

A conceptual one-line diagram of the project is provided in Figure 2-2.

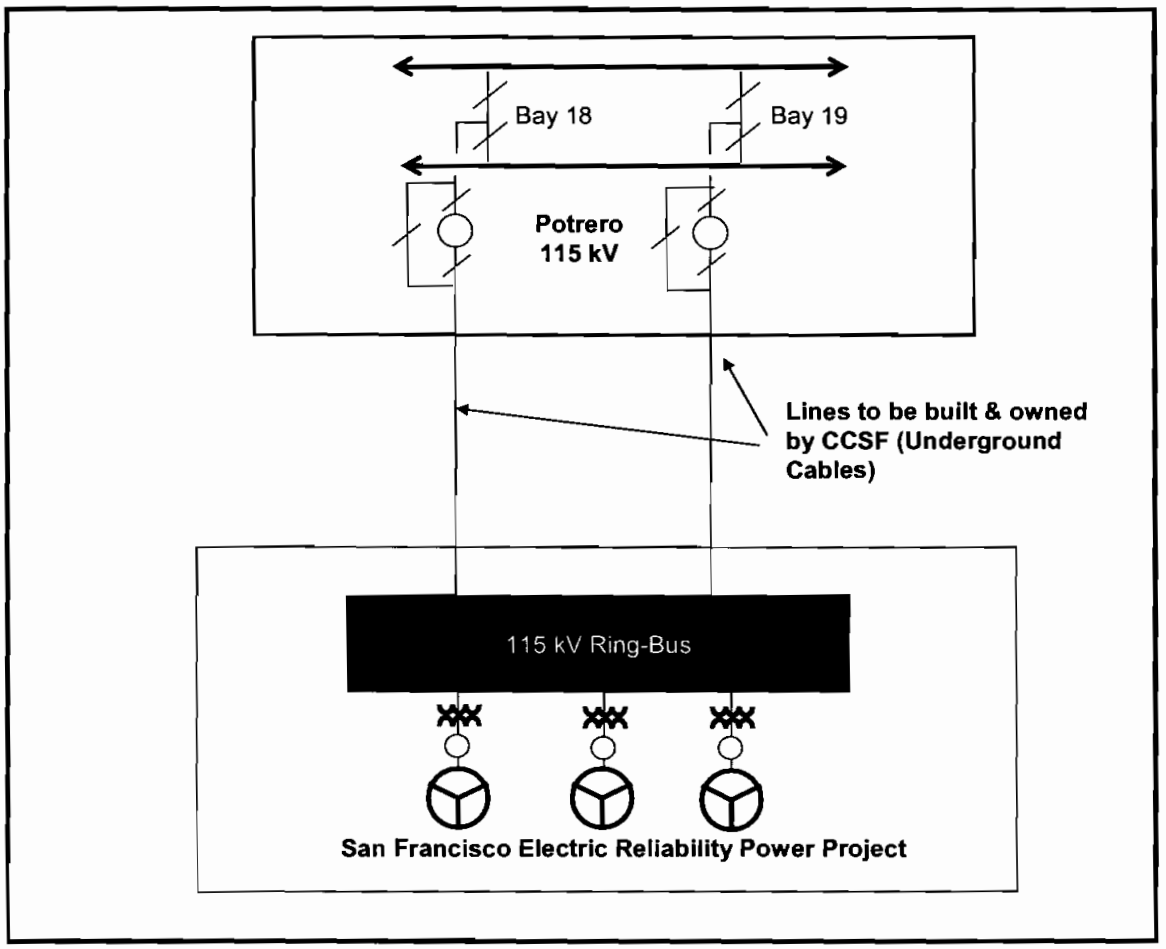

Figure 2-2: Conceptual One-Line Diagram of the San Francisco Electric Reliability Power Project

3. Cost Summary & Schedule

A cost summary is provided below with more detailed direct assignment costs provided in Subsection 3.1. Subsection 3.2 provides more detailed costs for the network upgrades required to interconnect the project. The costs are not final and will need to be reconciled with actual costs upon completion of the project. Appendix A and Section 5 provide the scope of the required work.

Total Direct Assignment Cost	$3,077,000
ITCC Tax @ 34 %	$1,046,180
Total Direct Assignment Cost with ITCC	**$4,123,180**
Network Upgrade Costs	$1,374,000
ITCC Tax @ 34 %	$467,160
Total Network Upgrade Cost with ITCC	**$1,841,160**
Total Costs	**$5,964,340**

3.1 Direct Assignment Facilities

Table 3-1 provides a summary of the cost estimates3 for the facilities required to interconnect the SFERPP with PG&E's transmission system. These are the facilities necessary to physically and electrically interconnect a New Facility Operator to the ISO Controlled Grid at the point of interconnection. These costs are not final and will need to be reconciled with actual costs upon completion of the project.

Substation Work at SFERPP Switchyard: Testing (SCADA/EMS and pre-parallel inspection)	$250,000
Substation Work at Potrero Switchyard: Add two (2) new 115 kV breakers with by-pass switches, associated protection, and telecommunications equipment for interconnection of generation tie lines	$2,747,000
Substation Work at SFERPP Switchyard: Install fiber termination equipment and testing	$70,000
PG&E Corporate Real Estate - 851 filing with CPUC	$10,000
Subtotal	$3,077,000
ITCC Tax (34%)	$1,046,180
Total	$4,123,180

Table 3-1: Direct Assignment Costs

3.2 Network Upgrades Costs

Network upgrades are those facilities beyond SFERPP's point of interconnection with PG&E's transmission grid that are required to interconnect the project or mitigate system impacts caused solely by the project. Table 3-2 provides a summary of the cost estimates for upgrades to the system that would be required to interconnect the project.

Substation Work at Potrero Switchyard: Install new control building with a battery room, battery, and charger. Install bus selector switches and insulators for the two generation tie line breakers	$924,000
Various PG&E Locations: Install telecommunications equipment to upgrade SF RAS	$400,000
PG&E TOC and Switching Center: SCADA/EMS, programming, testing, and screening	$50,000
Subtotal	$1,374,000
ITCC Tax (34%)	$467,160
Total	$1,841,160

Table 3-2: Network Upgrade Costs

[3] PG&E interconnection engineering cost estimates are developed with a theoretical confidence level of 25 percent. Billing will be based on an actual cost basis.

3.3 Tentative Construction Schedule

The tentative schedule to engineer and construct the facilities based on the work scope outlined in this F/UFS is approximately 18 months from the signing of the Generator Special Facilities Agreement. This is based upon the assumption that the environmental permitting obtained by CCSF is adequate for permitting all PG&E activities.

Note that if CPUC requires PG&E to obtain a Permit to Construct (PTC) for the generation tie line or any other work associated with the project, an additional $1 million to $2 million would be added to the project costs and the project could require an additional one to two years to complete.

4. Study Assumptions

PG&E conducted the F/UFS using the following assumptions:

1. The maximum total output from the San Francisco Electric Reliability Power Project is 151.5 MW from 3 LM6000 gas turbines. The expected total plant load is 6.4 MW. The maximum net output to the grid is 145.1 MW.

2. The expected on-line date is June 2007.

3. Each generator will have a step-up transformer. Each transformer is a three phase transformer, 13.8/115 kV grounded wye, rated 40/45/60 MVA @ 55/65 degree C temperature rise. The impedance is 10 - 12 % @ 40 MVA base.

4. CCSF will engineer, procure, construct, own, and maintain its project facility and the 115 kV generator tie lines.

5. Substation Evaluation

5.1 Direct Assignment Work

The substation evaluation determined a work scope for the Direct Assignment facilities required for interconnecting the proposed project. The major work is listed here and a more detailed work scope is provided in Appendix A.

- At Potrero Switchyard Bus Section E, use two spare bay positions Bay 18 and Bay 19 to create two 115 kV line breaker positions.

- Install two new 115 kV dead-end structures for the two in-coming underground cables by CCSF.

- Install 115 kV underground cable riser support structures for UG potheads. Install surge arrestors on same structures.

- Install new underground conduits and fiber optic cable between the new Potrero Switchyard control building and SFERPP control building.
- Install new meters, protective relays, instrumentation and controls, and SCADA.

5.2 Network Upgrades

The substation evaluation determined a work scope for the Network Upgrades required for interconnecting the project. A more detailed work scope is provided in Appendix A and the major work is:

- Install a new control building with a battery room, batteries, and charger.
- Install four (4) 115 kV bus selector air switches on existing structures.
- Modify the existing SFRAS to accommodate the new project.
- Install telecom equipment for EMS telemetry and SCADA.

6. Transmission Line Evaluation

The transmission line evaluation determined there would not be additional direct assignment transmission line work needed to interconnect the SFERPP, other than those included in the Substation Evaluation Section above.

7. Land Evaluation / Environmental Evaluation/ Permitting

PG&E's Corporate Real Estate department has estimated land services costs for the proposed SFERPP. A cost estimate has been provided in Section 3 to reflect the time and consideration needed for preparation of the filing that may be required by Public Utilities Code Section 851.

Because PG&E is subject to CPUC jurisdiction, it must comply with Public Utilities Code Section 851. Among other requirements, this code requires PG&E to obtain CPUC approval of leases and licenses to use PG&E property, including rights-of-way granted to third parties for interconnection facilities. Obtaining CPUC approval for a Section 851 application can take several months, and requires compliance with the California Environmental Quality Act (CEQA). PG&E recommends that Section 851 issues be identified as early as possible so that the necessary application can be prepared and processed. The G.O. 131-D approval process is not within PG&E's scheduling control and is dependent upon intervener interest. Approval schedules can be extended significantly.

7.1 CPUC General Order 131-D

Pacific Gas and Electric Company (PG&E) is subject to the jurisdiction of the California Public Utilities Commission (CPUC); and must comply with CPUC General Order 131-D (Order) on the construction, modification, alteration, or addition of all electric transmission facilities (i.e., lines, substations, switchyards, etc.). This includes facilities to be constructed by others and deeded to PG&E. In most cases where PG&E's electric facilities are under 200 kV and are part of a larger project (i.e., electric generation plant), the Order exempts PG&E from obtaining an approval from the CPUC provided it's planned facilities have been included in the larger project's California Environmental Quality Act (CEQA) review, the review has included circulation with the State Clearinghouse, and the project's lead agency (i.e., California Energy Commission) finds no significant unavoidable environmental impacts. PG&E or the project developer may proceed with construction once PG&E has filed notice with the CPUC and the public on the project's exempt status, and the public has had a chance to protest PG&E's claim of exemption. If PG&E facilities are not included in the larger project's CEQA review, or if the project does not qualify for the exemption, PG&E may need to seek approval from the CPUC (i.e., Certificate of Public Convenience and Necessity or Permit to Construct) taking as much as 18 months or more since the CPUC would need to conduct it's own environmental evaluation (i.e., Negative Declaration or Environmental Impact Report).

PG&E recommends that the project proponent include PG&E facility work in its project description and application to the lead agency performing CEQA review on the project. The lead agency must consider the environmental impacts of the interconnection electric facility, whether built by the developer with the intent to transfer ownership to PG&E or to be built and owned by PG&E directly, and make a finding of no significant unavoidable environmental impacts from construction of those facilities. Once the project has completed the review process and the environmental document (i.e., Negative Declaration or Environmental Impact Report) finds no significant unavoidable environmental impacts from PG&E's work, PG&E would file an Advice Letter with the CPUC and publish public notice of the proposed construction of the facilities. The noticing process takes about 90 days if no protests are filed, but should be done as early as possible so that a protest does not delay construction. PG&E has no control over the time it takes the CPUC to respond when issues arise. If the protest is granted, PG&E may then need to apply for a formal permit to construct the project (i.e., Certificate of Public Convenience and Necessity or Permit to Construct). Facilities built under this procedure must also be designed to include consideration of electric and magnetic field (EMF) mitigation measures pursuant to PG&E "EMF Design Guidelines of New Electrical Facilities: Transmission, Substation and Distribution".

Please see Section III, in General Order 131-D. This document can be found in the CPUC's web page at:

http://www.cpuc.ca.gov/PUBLISHED/GENERAL_ORDER/589.htm

8. Study Updates

This F/UFS is performed according to the assumptions shown in the section titled "Study Assumptions". In the event that these assumptions are changed, an updating study may be required to re-evaluate SFERPP's impact on PG&E's transmission grid. CCSF would be responsible for paying for any such updating study. Examples of changes that might prompt such a study are:

- Change in interconnection date.
- Change in Interconnection Queue position.
- Change in project's MW size.
- Change in interconnection plan.

9. Stand-by Power

This study does not address any requirements for stand-by power that the project may require. CCSF should contact their Generation Interconnection Services representative regarding this service.

Note: CCSF is urged to contact their Generation Interconnection Services representative promptly regarding stand-by service in order to ensure its availability for the project's start-up date.