APPENDIX 5D

Facilities Study Plan

Facilities Study Plan

Generation Interconnection

Pacific Gas & Electric Company

Humboldt Bay Power Plant Re-powering Project

REVISION 2

Pacific Gas and Electric Company

WE DELIVER ENERGY.

June 16, 2006

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1. Introduction

Humboldt Bay Power Plant Re-power Project (the Project) proposes to interconnect a new 166.38 MW generating facility to replace the existing generation at the Pacific Gas & Electric's (PG&E) Humboldt Bay Power Plant (HBPP) Substation in Humboldt County, California. The Project has proposed a commercial operational date of August 2008. PG&E issued a System Impact Study (SIS) for the Project on January 20, 2006 that provided an analysis of the system impacts.

Per California Independent System Operator Corporation (CAISO) Amendment 39 Process and based on the issued SIS, the Facilities Study (FS) will provide:

1. Work scope and cost estimates for the Direct Assignment[1] facilities necessary to interconnect the Project to PG&E's grid.

2. Work scope and cost estimates for the Network Upgrade[2] facilities necessary to interconnect the Project under various system conditions.

This FS Plan will form the basis for the Facilities Study Agreement (FSA) by defining the scope, content, assumptions, and terms of reference of the FS.

2. Study Fee

PG&E has estimated a study fee of $30,000 for performing the FS. The final cost to complete the FS will be based upon actual cost.

PG&E will provide the Project a record of actual costs for performing the FS approximately two months after the study is completed. PG&E will bill the Project the remaining balance if the actual cost is higher than the estimated $30,000. If the actual cost is less than the estimated study fee, PG&E will refund the balance to the Project.

3. Schedule

Table 3-1 shows the tentative milestones/schedules associated with this FS.

[1] The transmission facilities necessary to physically and electrically interconnect the Project to the ISO Controlled Grid at the point of interconnection.
[2] The transmission facilities, other than Direct Assignement Facilities, beyond the point of interconnection necessary to interconnect the Project safely and reliably to the ISO Controlled Grid.

Task	Milestone Description	Target Date
1	Establish study commencement date based on receipt of study fee with the FSA	April 10, 2006
2	Issue Facilities Study Report	August 11, 2006*

Table 3-1: Study Schedule

* Because of the complexity of this study, the FS will require more than 60 calendar days to complete.

The Project has executed an FSA and paid the $30,000 of estimated study fee.

4. Cost Estimates

All costs provided will be estimates only. Charges for implementing the interconnection of the Project will be made based upon the actual costs incurred.

4.1 Direct Assignment Costs

A cost estimate will be provided based upon a commercial operation date in August 2008. This cost estimate will include any substation and transmission line facilities required to interconnect the Project. The estimate will include facilities from the high side of the generator step-up transformers to points of interconnection.

4.2 Network Upgrade Costs

A cost estimate will also be provided for any substation and transmission line facility additions or upgrades for mitigating any negative impacts on PG&E's existing facilities that are beyond points of Interconnection.

5. Project and Interconnection Information

The Project consists of ten reciprocating engine generators, each rated 16.638 MW. With 3.65 MW auxiliary loads, the maximum net output to the grid is 162.7 MW. Four generators are connected to the 115 kV transmission system, and two three-generator groups are connected to the 60 kV bus at HBPP Substation.

A conceptual one-line diagram of the Project is shown in Figure 5-1.

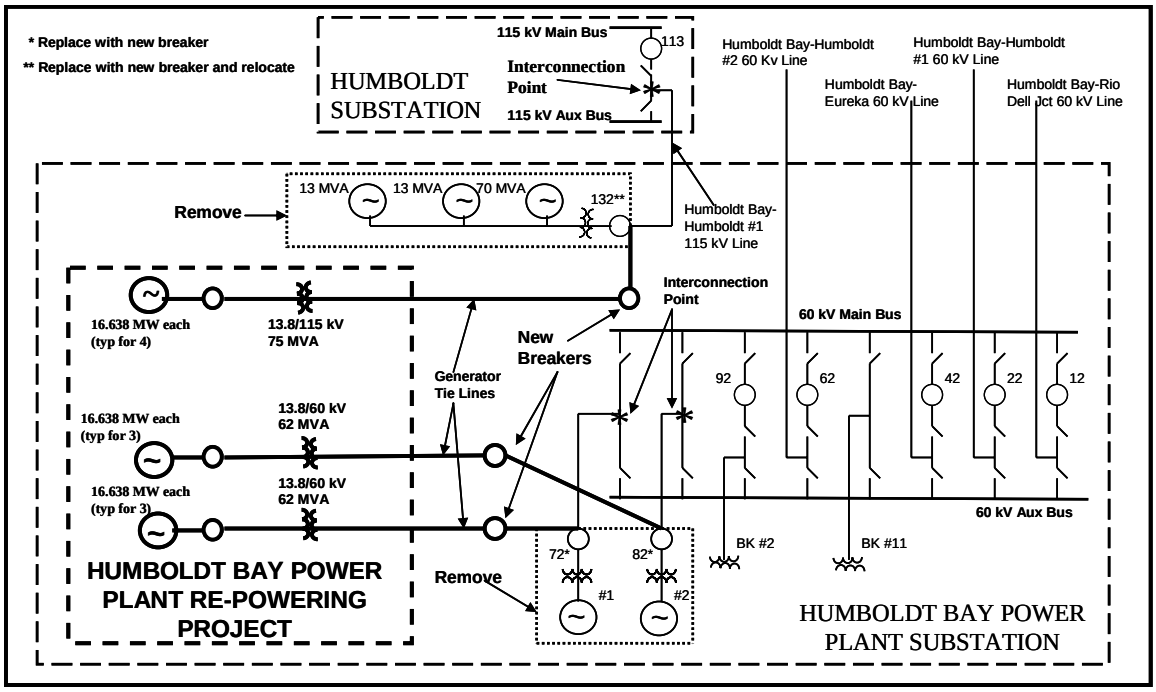

Figure 5-1: Conceptual One-Line Diagram This diagram is incorrect. There are 2 MEPP units rated at 15 MVA. There is not 70 MVA unit. The new Wartsilla transformer ratings need to be corrected and Bank 11 is on the south side of the switchyard

Figure 5-2 provides the map for the Project and the transmission facilities in the vicinity.

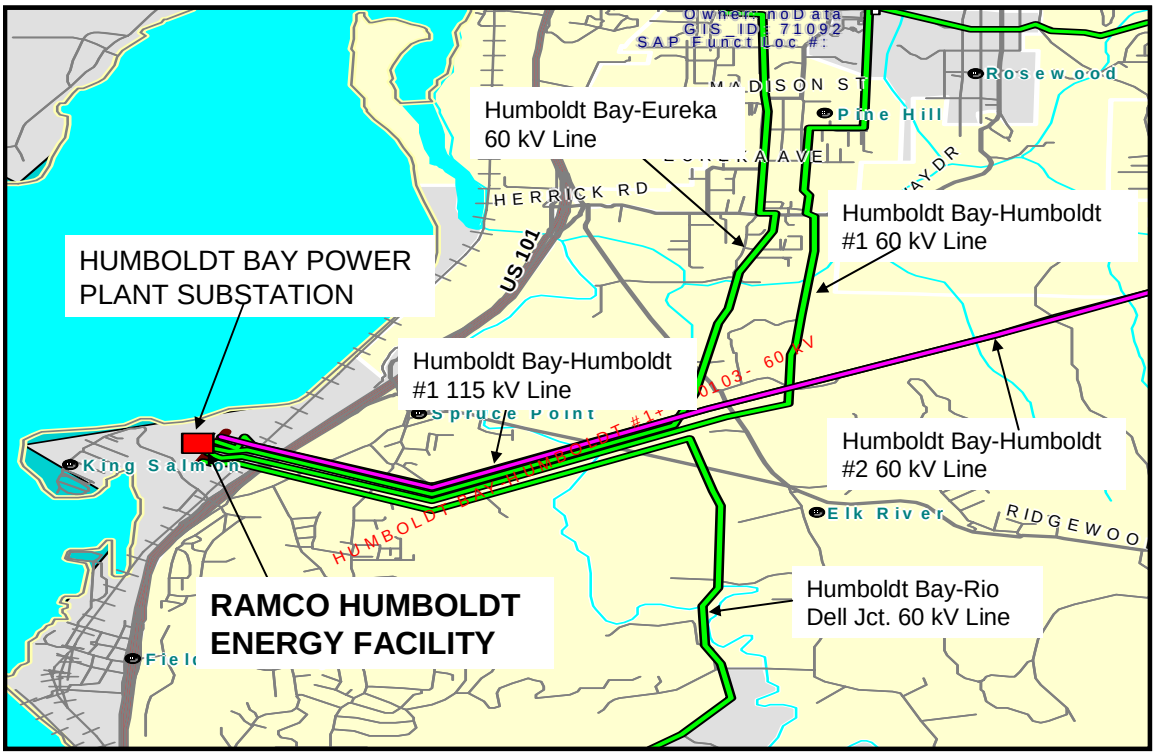

Figure 5-2: Vicinity Map

6. Study Assumptions

PG&E will conduct the FS under the following assumptions:

1) The Project consists of ten reciprocating engine generators, each rated for 16.638 MW. The maximum output to the grid from the facilities is 162.7 MW with ancillary load of 3.65 MW. Four generators are connected to the 115 kV line, and two three-generator groups are connected to the 60 kV bus at HBPP Substation.

2) The expected commercial operation date is August 2008.

3) The Project employs three step-up transformers. Two step-up transformers are three phase, 13.8/60 kV delta/wye grounded transformers rated for 36/48/62 MVA @ 55 degree C rise, or 40/55/67 MVA @ 65 degree C rise with impedance of 8% @ 36 MVA base. The third step-up transformer is a three phase, 13.8/115 kV delta/wye grounded transformer rated for 45/60/75 MVA @ 55 degree C rise, or 50/67/84 MVA @ 65 degree C rise with an impedance of 8.5% @ 45 MVA base.

4) The Project will engineer, procure, and construct facilities up to the high side of step-up transformers.

5) PG&E will engineer, procure, and construct the generator tie lines (from high side of generator step-up transformers through CB-72, CB-82, and CB-132 onto 60 kV bus and 115 kV transmission system). Two 60 kV generator tie lines are less than 500 ft in length with 715.5 kcmil Al conductor or equivalent. One 115 kV generator tie line is less than 700 ft in length with 715.5 kcmil Al conductor or equivalent.

7. System Impact Study Results

The SIS issued on January 20, 2006 concluded that the Project would:

1) Cause no Category “A” normal overloads on PG&E transmission lines

2) Cause one (1) new Category “B” and one (1) new Category “C” emergency overloads both on the same PG&E transmission facility during summer off peak condition:

   - Humboldt-Trinity 115 kV Line

3) Exacerbate five (5) pre-project Category “C” emergency overloads to the following four facilities:

   - Humboldt Bay-Eureka 60 kV Line (summer and winter peak)

- Bridgeville 115/60 kV Bank # 1 (winter peak)
- Humboldt 115/60 kV Bank # 1 (winter peak)
- Humboldt 115/60 kV Bank # 2 (winter peak)

4) Cause no overstressed breakers.

5) Cause several 60 kV bus voltage drops of 5% or more from the pre-project levels, and cause PG&E's system to fail to meet the applicable voltage criteria.

6) Potentially cause sustained low frequency violations for faults on the Humboldt Bay-Humboldt #1 and Humboldt Bay-Eureka 60 kV Lines, and sustained low voltage violations for a Humboldt 115 kV bus fault. Specific mitigation measures will be developed during the FS.

7) Require a non-pilot protection scheme on the Humboldt Bay-Humboldt 115kV line and modification of the Humboldt Bay 60 kV bus differential protection scheme.

8. Facilities Study Scope

The FS will provide work scope and cost estimates for: (1) Direct Assignment Facilities required interconnecting the Project to the PG&E grid and (2) Network Upgrades to PG&E transmission facilities required to interconnect the Project and mitigate system impacts and. The specific studies conducted by the FS are:

8.1 Transmission Line Evaluation

8.1.1 Direct Assignment

PG&E will construct two 60 kV generator tie lines from the high side of the 60 kV step-up transformers to the 60 kV bus Via breakers CB-72 and CB-82 and one 115 kV generator tie line from the high side of the 115 kV step-up transformer to the existing Humboldt Bay-Humboldt #1 115 kV line via breaker CB-132 at HBPP Substation. Work scope and cost estimates will be provided for constructing these generator tie lines.

8.1.2 Network Upgrades

The Transmission Line Evaluation will provide the work scope and cost estimates for any required substation work that is beyond points of Interconnection.

Section 7 Item 2) identified emergency overloads of the Humboldt – Trinity 115 kV line. Mitigation would be by means of running only three of the four generators, as proposed, on the 115 kV System.

The Project plans to provide a special protection scheme to reduce one generator unit when the contingency occurs. Therefore, there will be no transmission Network Upgrades for the Project.

8.2 Substation Evaluation

8.2.1 Direct Assignment

The Project will construct its own substation/switchyard; therefore, no work scope or cost estimates will be provided in the FS. The new substation/switchyard shall incorporate the required relaying as specified in the PG&E's Transmission Interconnection Handbook per Section G2.1. Note that there is a redundancy requirement for the application of multifunction relays.

The Substation Evaluation will provide the work scope and cost estimates for any required substation work from the Project facility up to points of interconnection. This includes but is not limited to:

- Remove the existing breaker CB-132 and Install a new 115 kV circuit breaker. Reconnect the existing two mobile generators through this new breaker onto the existing Humboldt Bay-Humboldt #1 115 kV line.
- Install two new 60 kV breakers near the existing 60 kV bus. Remove CB-72 and CB-82 and provide associated substation work
- Installation of protection relays and upgrading of the existing equipment into the existing relay room
- Conducting pre-parallel inspection, testing, SCADA, EMS setup, and engineering support, etc.

Removal of wiring, relays, and panels associated with breakers CB-72, CB-82, and CB-132 are not covered in this FS.

8.2.2 Network Upgrades

The Substation Evaluation will provide the work scope and cost estimates for any required substation work that is beyond points of interconnection. This includes but is not limited to:

- Installing a non-pilot protection scheme on the Humboldt Bay-Humboldt 115kV line
- Modifying the Humboldt Bay 60 kV bus differential protection scheme
- Implementing protection upgrades to achieve faster fault clearing times on the Humboldt Bay-Humboldt #1 and

Humboldt Bay-Eureka 60 kV lines, and faster fault clearing times on the Humboldt 115 kV bus

- Installing Special Protection Scheme (SPS) to mitigate emergency overloads caused by the Project, or to otherwise accommodate the Project, as determined during the FS
- Upgrading system protection equipment to maintain protective relay coordination as a result of the Project
- Provide SCADA

8.3 Land Evaluation

8.3.1 Direct Assignment

The Land Evaluation will provide the work scope and cost estimates for any required substation work from the Project facility up to points of interconnection. This includes but is not limited to:

PG&E's Corporate Real Estate Department will determine the new land rights required for the Project, and if any new land rights and/or easements are needed to install new facilities that might be required for the interconnection of the Project. The work scope and cost estimates will be provided for new land rights and permit requirements.

8.3.2 Network Upgrades

The Land Evaluation will provide the work scope and cost estimates for any required substation work that is beyond points of Interconnection. This includes but is not limited to:

PG&E's Corporate Real Estate Department will determine if any new land rights and/or easements are needed to upgrade existing PG&E facilities that are negatively impacted by the Project. The work scope and cost estimates will be provided for new land rights and permit requirements.

9. Environmental Evaluation/ Permitting

9.1 CPUC General Order 131-D

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 its 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 its 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

9.2 CPUC Section 851

Because PG&E is subject to the jurisdiction of the CPUC, it must also comply with Public Utilities Code Section 851. Among other things, this code provision 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.

10. Study Updates

This FS will be 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 reevaluate the Project's impact on PG&E's transmission grid. The Project would be responsible for paying for any such updating study. Some of the changes that might prompt an update study are:

- Change in Queue position
- Modifications to a higher Queue project
- Change in the SIS or FS assumptions

11. Stand-by Power

This study does not address any requirements for standby power that the Project may require. The Project should contact their Generation Interconnection Services representative regarding this service.

Note: The Project 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.

Facilities Study Agreement

Applicant has reviewed the Facilities Study Plan for the interconnection of Applicant's Humboldt Energy Facility Project __ with PG&E's system in Humboldt County, State of California, and agrees with the proposed study plan.

Applicant agrees to pay the proposed study fee.

Dated this _____ day of _____, 2006

APPLICANT:

BY: _____
(Signature)

_____
(Type or Print Name)

TITLE: _____

MAILING ADDRESS:

_____

_____

_____