

Jeri Scott - FW: RCEC - Responses from PG&E to Follow-up Transmission Questions

From: <Doug.Davy@CH2M.com>
To: <Jscott@energy.state.ca.us>, <glw@eslawfirm.com>
Date: 2/2/2007 10:38 AM
Subject: FW: RCEC - Responses from PG&E to Follow-up Transmission Questions

Jeri,

Here is a copy of a an e-mail that Jim McLucas of Calpine has sent to Ajoy Guha in response to his informal questions regarding transmission system engineering.

Thanks very much,

Doug Davy
 Senior Project Manager
 CH2M HILL
 2485 Natomas Park Drive, Suite 600
 Sacramento, CA 95833
 (916) 286-0278
ddavy@ch2m.com

DOCKET 01-AFC-7	
DATE	FEB 02 2007
RECD.	FEB 05 2007

From: Jim McLucas [mailto:jmclucas@calpine.com]
Sent: February 02, 2007 10:15 AM
To: Ajoy Guha (CEC)
Cc: Michael Hatfield; Davy, Doug/SAC; Gregg Wheatland (glw@eslawfirm.com); Alan Roth
Subject: RCEC - Responses from PG&E to Follow-up Transmission Questions

Ajoy -

Attached are responses from PG&E addressing your follow-up questions to our previous data responses pertaining to transmission. Also attached is a copy of the referenced November 7, 2006 CAISO approval letter. If you have any additional questions, please give me a call.

Thanks!

Jim McLucas

Manager, Water Technology & Chemical Operations

Calpine Corporation

P.O. Box 551

Pittsburg, California 94565

925/431-1304

925/431-1308 (fax)

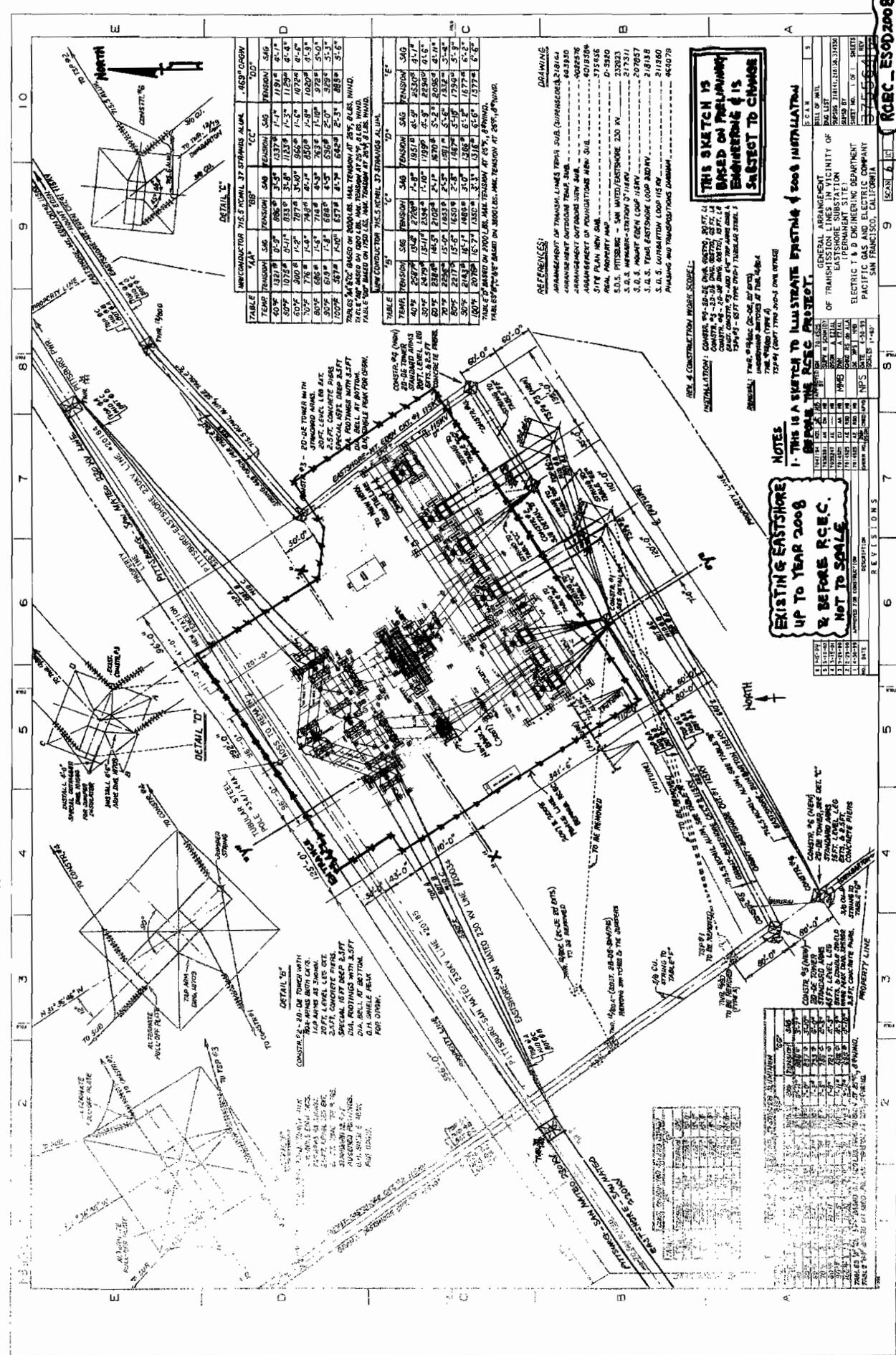


TABLE 1
TENSION SAG TENSION SAG TENSION SAG

TEMP	TENSION	SAG	TENSION	SAG	TENSION	SAG
40°F	1327.9	55.2'	1337.9	55.2'	1347.9	55.2'
50°F	1075.9	61.7'	1085.9	61.7'	1095.9	61.7'
60°F	802.9	70.7'	812.9	70.7'	822.9	70.7'
70°F	588.9	81.7'	598.9	81.7'	608.9	81.7'
80°F	438.9	95.7'	448.9	95.7'	458.9	95.7'
90°F	338.9	111.7'	348.9	111.7'	358.9	111.7'
100°F	288.9	129.7'	298.9	129.7'	308.9	129.7'
110°F	258.9	149.7'	268.9	149.7'	278.9	149.7'
120°F	238.9	171.7'	248.9	171.7'	258.9	171.7'

TABLE 2
TENSION SAG TENSION SAG TENSION SAG

TEMP	TENSION	SAG	TENSION	SAG	TENSION	SAG
40°F	2527.9	135.2'	2537.9	135.2'	2547.9	135.2'
50°F	2075.9	151.7'	2085.9	151.7'	2095.9	151.7'
60°F	1502.9	170.7'	1512.9	170.7'	1522.9	170.7'
70°F	1088.9	191.7'	1098.9	191.7'	1108.9	191.7'
80°F	788.9	215.7'	798.9	215.7'	808.9	215.7'
90°F	558.9	243.7'	568.9	243.7'	578.9	243.7'
100°F	388.9	275.7'	398.9	275.7'	408.9	275.7'
110°F	268.9	311.7'	278.9	311.7'	288.9	311.7'
120°F	188.9	351.7'	198.9	351.7'	208.9	351.7'

TABLE 3
TENSION SAG TENSION SAG TENSION SAG

TEMP	TENSION	SAG	TENSION	SAG	TENSION	SAG
40°F	4027.9	225.2'	4037.9	225.2'	4047.9	225.2'
50°F	3275.9	251.7'	3285.9	251.7'	3295.9	251.7'
60°F	2302.9	280.7'	2312.9	280.7'	2322.9	280.7'
70°F	1588.9	311.7'	1598.9	311.7'	1608.9	311.7'
80°F	1058.9	345.7'	1068.9	345.7'	1078.9	345.7'
90°F	708.9	383.7'	718.9	383.7'	728.9	383.7'
100°F	458.9	425.7'	468.9	425.7'	478.9	425.7'
110°F	288.9	471.7'	298.9	471.7'	308.9	471.7'
120°F	158.9	521.7'	168.9	521.7'	178.9	521.7'

TABLE 4
TENSION SAG TENSION SAG TENSION SAG

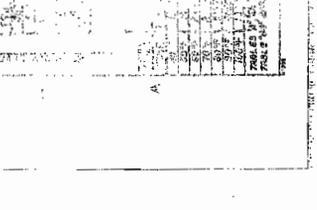
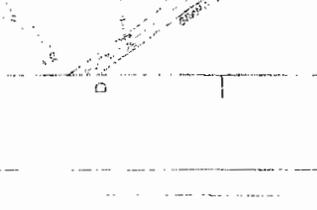
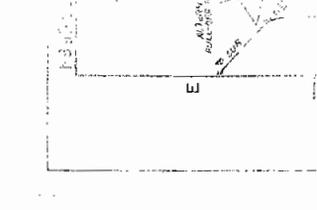
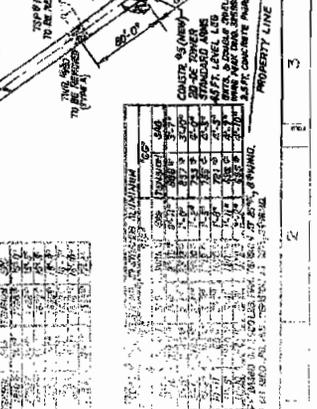
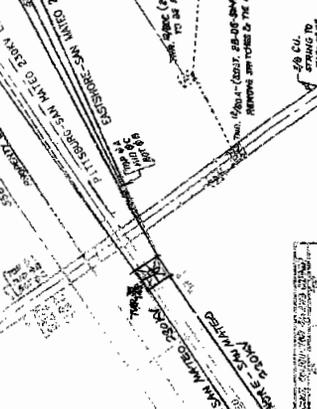
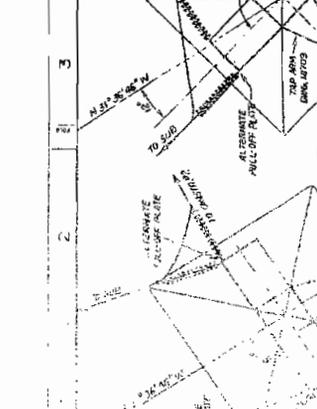
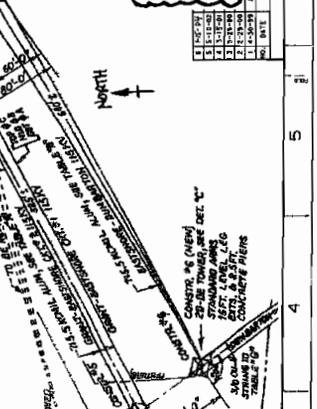
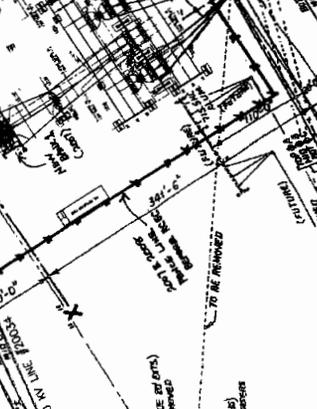
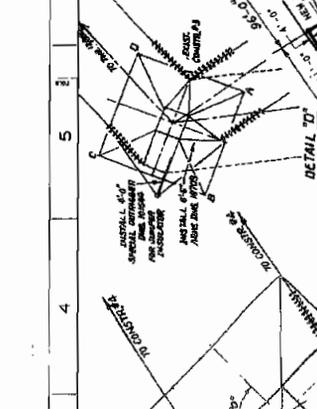
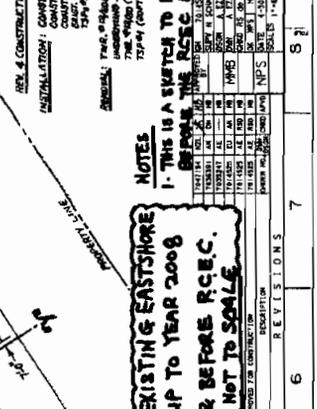
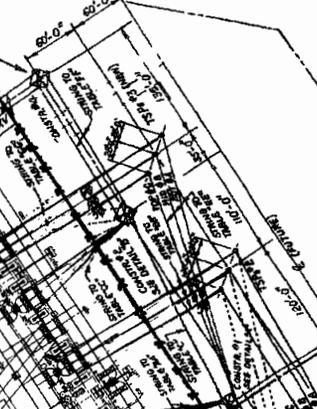
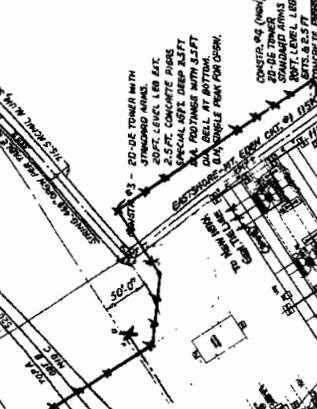
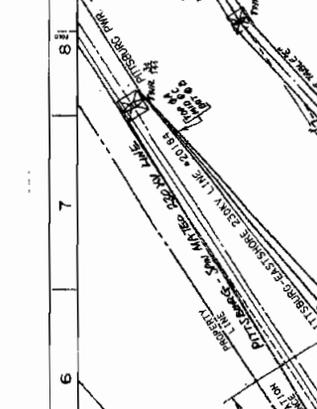
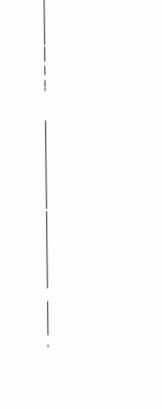
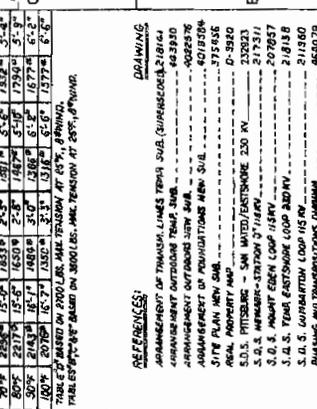
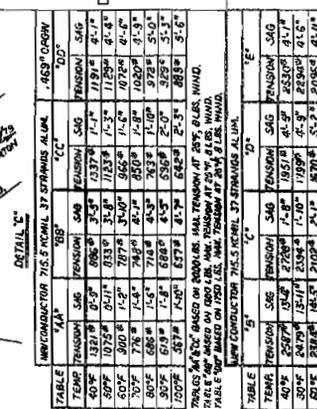
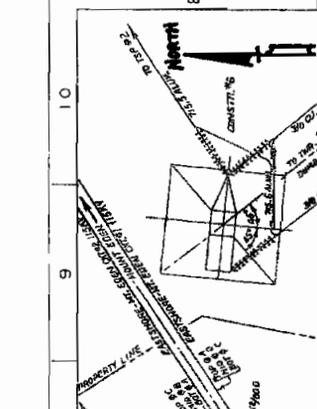
TEMP	TENSION	SAG	TENSION	SAG	TENSION	SAG
40°F	6527.9	345.2'	6537.9	345.2'	6547.9	345.2'
50°F	5275.9	381.7'	5285.9	381.7'	5295.9	381.7'
60°F	3802.9	420.7'	3812.9	420.7'	3822.9	420.7'
70°F	2588.9	461.7'	2598.9	461.7'	2608.9	461.7'
80°F	1658.9	505.7'	1668.9	505.7'	1678.9	505.7'
90°F	1008.9	553.7'	1018.9	553.7'	1028.9	553.7'
100°F	558.9	605.7'	568.9	605.7'	578.9	605.7'
110°F	308.9	661.7'	318.9	661.7'	328.9	661.7'
120°F	158.9	721.7'	168.9	721.7'	178.9	721.7'

TABLE 5
TENSION SAG TENSION SAG TENSION SAG

TEMP	TENSION	SAG	TENSION	SAG	TENSION	SAG
40°F	10527.9	485.2'	10537.9	485.2'	10547.9	485.2'
50°F	8275.9	531.7'	8285.9	531.7'	8295.9	531.7'
60°F	5802.9	580.7'	5812.9	580.7'	5822.9	580.7'
70°F	3988.9	631.7'	3998.9	631.7'	4008.9	631.7'
80°F	2658.9	685.7'	2668.9	685.7'	2678.9	685.7'
90°F	1608.9	743.7'	1618.9	743.7'	1628.9	743.7'
100°F	858.9	805.7'	868.9	805.7'	878.9	805.7'
110°F	458.9	871.7'	468.9	871.7'	478.9	871.7'
120°F	208.9	941.7'	218.9	941.7'	228.9	941.7'

TABLE 6
TENSION SAG TENSION SAG TENSION SAG

TEMP	TENSION	SAG	TENSION	SAG	TENSION	SAG
40°F	15527.9	645.2'	15537.9	645.2'	15547.9	645.2'
50°F	12275.9	701.7'	12285.9	701.7'	12295.9	701.7'
60°F	8802.9	760.7'	8812.9	760.7'	8822.9	760.7'
70°F	5988.9	821.7'	5998.9	821.7'	6008.9	821.7'
80°F	3958.9	885.7'	3968.9	885.7'	3978.9	885.7'
90°F	2508.9	953.7'	2518.9	953.7'	2528.9	953.7'
100°F	1258.9	1025.7'	1268.9	1025.7'	1278.9	1025.7'
110°F	608.9	1101.7'	618.9	1101.7'	628.9	1101.7'
120°F	258.9	1181.7'	268.9	1181.7'	278.9	1181.7'



NOTES: THIS SKETCH IS BASED ON PRELIMINARY ENGINEERING & IS SUBJECT TO CHANGE. EXISTING EASTSHORE UP TO YEAR 2008 & BEFORE RCBC. NOT TO SCALE. REVISIONS: 1. THIS IS A SKETCH TO ILLUSTRATE EXISTING & 2008 INSTALLATION. GENERAL ARRANGEMENT OF TRANSMISSION LINES IN VICINITY OF EASTSHORE SUBSTATION. ELECTRICITY PERMITMENT SITE DEPARTMENT OF PUBLIC UTILITIES AND ENERGY, PACIFIC GAS AND ELECTRIC COMPANY, SAN FRANCISCO, CALIFORNIA. RCBC - ES002008

The following information addresses the CEC staff's additional questions which you conveyed to us.

- Data Requests 45: A one line diagram for Eastshore Substation may be found on page 2 of the November 2, 2006 Interconnection Facilities Study Report (Re-Study). Sketch Eastshore_SL2009, based on preliminary engineering and subject to change, is attached. It shows the electrical single line of Eastshore Substation for and after the RCEC project. The equipment ratings, as currently planned, are as follows:
 - 230 kV bus: 3000 ACC for Main Bus 1 and Bus 2. 2000 ACC for each BAAH (breaker-and-a-half) bay
 - 230 kV circuit breakers: 2000 ACC, 40kA IC
 - 230 kV disconnect switches: 2000 ACC
 - 115kV/230kV transformers: 3-phase, autotransformer, 252/336/420 MVA, ONAN/ONAF/ONAF, HV 230/120kV Ground-Y, TV 13.2kV Grounded-Delta

Sketches RCEC_ESOD2008 and RCEC_ESOD2009, based on preliminary engineering and subject to change, are attached. Sketch RCEC_ESOD2008 shows the existing Eastshore Substation plus the replacement of the 230/115 kV Transformer No. 1 with one three-phase 420 MVA bank, under the PG&E Project No. P.01951, and the installation of one new 115 kV breaker position in 2008 for P0413 generation project. This sketch shows Eastshore Substation before the RCEC project. Sketch RCEC_ESOD2009 conceptually shows Eastshore Substation after the RCEC project. This sketch shows the approximate location of the fence line for the expanded substation. A detailed general arrangement drawing is not available at this time. However, we can confirm that our work to date shows that there is sufficient physical space available for the RCEC equipment. The existing 230 kV portion of the substation, which will be expanded to accommodate the interconnection of RCEC, is on the north side of the substation. The 230 kV portion of the substation will be expanded to the west.

- Data Request 46: We offer the following additional clarifications:
 - There are two 230kV transmission lines from Pittsburg, which come onto the Eastshore property from the east and then leave toward the west to the San Mateo Substation. One of these two lines presently loops into the Eastshore Substation; the other does not. This configuration will not change as a result of the interconnection of RCEC.
 - The existing Eastshore-San Mateo 230 kV transmission line will be reconductored to mitigate the impacts of the RCEC. The RCEC system impacts do not necessitate reconductoring the existing Pittsburg-San Mateo 230 kV transmission line.
 - The last line of the response could be clarified by adding the underlined: "CAISO approved the interconnection of the RCEC Project, Project No. P02186, on 11/7/2006."

- Data Request 49: The project in question is that which may be found in the CAISO's queue position 63 dated 11/27/2006. The CAISO queue indicates that this project was withdrawn from the queue on January 4th, 2007. With this project withdrawn from the queue, the pre-project normal loading on the Contra-Costa-Delta Pumps 230 kV and Tesla-Delta Pumps 230 kV lines will be less and the post-project impacts associated with the RCEC would not be expected to result in an overload of the Contra-Costa-Delta Pumps 230 kV or Tesla-Delta Pumps 230 kV lines. CAISO and PG&E agreed that it is not necessary to perform an SIS re-study to evaluate the impacts to the RCEC project as a result of the 157.5 MW project being removed from the queue.
- Data Response 50: Although the RCEC project shows Category "C" emergency overloads on the Sobrante-Moraga 115 kV and Contra Costa-Brentwood 115 kV lines, no reconductoring proposed to mitigate these overloads as PG&E does not typically re-conductor for Category "C" overloads. Such overloads may be mitigated by a Special Protection Scheme (SPS) or other minor mitigation measures. An SPS may include protection upgrades (new relays, communications, RTU's, SCADA equipment, etc.) to automatically reduce the overloads for specific conditions such as the loss of multiple transmission lines. Other mitigation measures may include operator action, or manual generation curtailment, and may not include an SPS. In any event, the mitigation measures implemented to address these particular overloads will be confined to work within the existing fence lines of PG&E substations. These overloads were not overlooked in the Re-Study. The 1% overload on the Contra Costa-Brentwood 115 kV line was determined to be insignificant (i.e. within the accuracy of the study), whereas the 3% overload on the Sobrante-Moraga 115 kV line is addressed at the bottom of page 9 and top of page 10.
- Data Response 51. The Re-Study no longer includes the SPS identified in 2002. Circumstances have changed (projects dropped from the queue, generation and transmission projects were built, etc.). It would take a lot of time and effort to try to re-create the queue and other factors between 2001 and today. The important thing is that the previously identified SPS was not simply overlooked, but instead is no longer necessary.

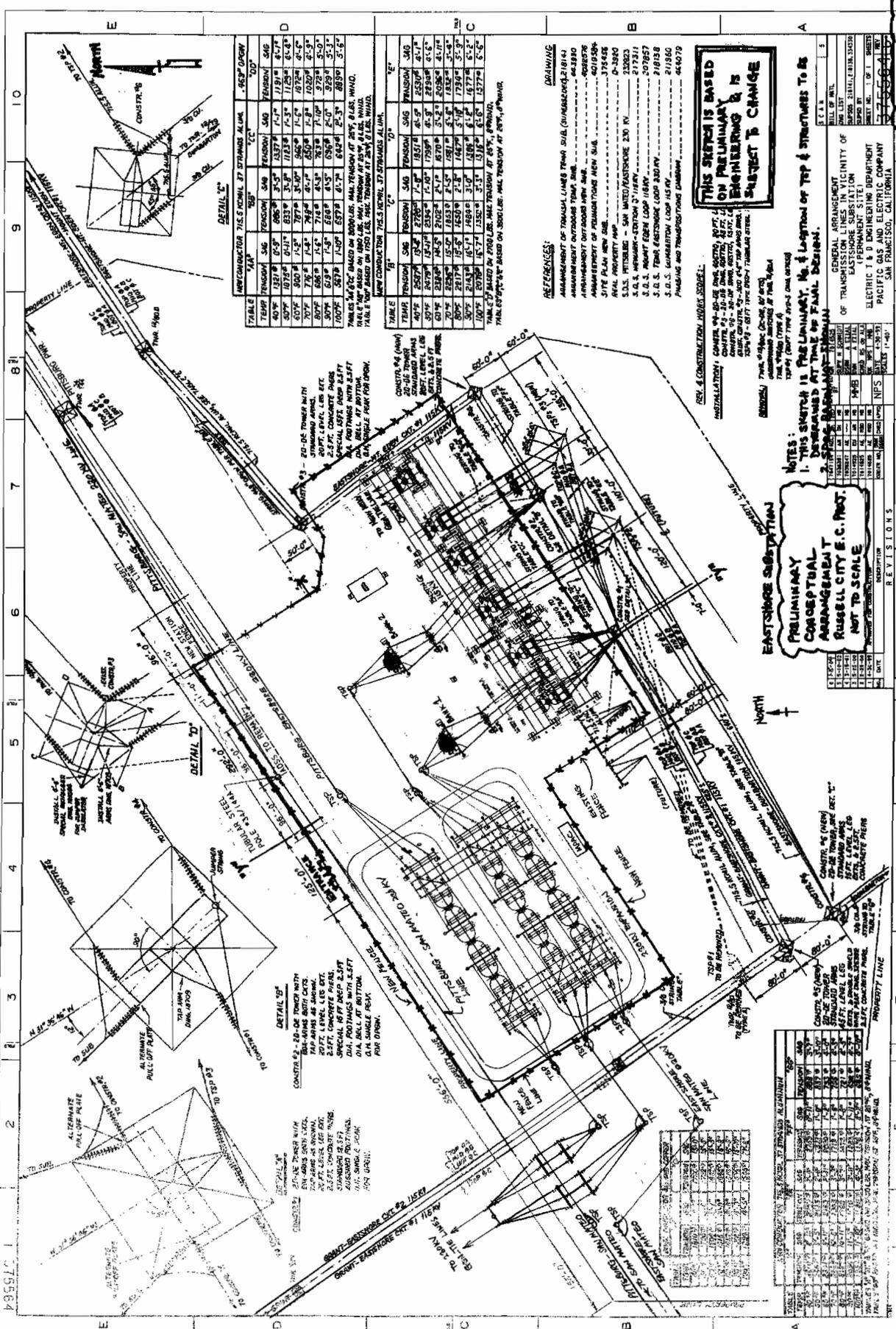


TABLE 1
ANTENNA CONDUCTOR TENSILE STRENGTHS ALONG 4-85°F DRYWIND

TEMP	TENSION SAG	TENSION SAG	TENSION SAG
°F	TONS	FT	TONS
60°F	13.21	0.5"	13.21
70°F	10.75	0.75"	10.75
80°F	9.00	1.0"	9.00
90°F	7.76	1.4"	7.76
100°F	6.98	1.8"	6.98
110°F	6.59	2.3"	6.59
120°F	6.41	2.8"	6.41
130°F	6.37	3.3"	6.37
140°F	6.38	3.8"	6.38
150°F	6.43	4.3"	6.43
160°F	6.52	4.8"	6.52
170°F	6.65	5.3"	6.65
180°F	6.81	5.8"	6.81
190°F	6.99	6.3"	6.99
200°F	7.19	6.8"	7.19
210°F	7.40	7.3"	7.40
220°F	7.62	7.8"	7.62
230°F	7.85	8.3"	7.85
240°F	8.09	8.8"	8.09
250°F	8.34	9.3"	8.34
260°F	8.59	9.8"	8.59
270°F	8.85	10.3"	8.85
280°F	9.11	10.8"	9.11
290°F	9.38	11.3"	9.38
300°F	9.65	11.8"	9.65

TABLE 2
ANTENNA CONDUCTOR TENSILE STRENGTHS ALONG 4-85°F WIND

TEMP	TENSION SAG	TENSION SAG	TENSION SAG
°F	TONS	FT	TONS
60°F	13.21	0.5"	13.21
70°F	10.75	0.75"	10.75
80°F	9.00	1.0"	9.00
90°F	7.76	1.4"	7.76
100°F	6.98	1.8"	6.98
110°F	6.59	2.3"	6.59
120°F	6.41	2.8"	6.41
130°F	6.37	3.3"	6.37
140°F	6.38	3.8"	6.38
150°F	6.43	4.3"	6.43
160°F	6.52	4.8"	6.52
170°F	6.65	5.3"	6.65
180°F	6.81	5.8"	6.81
190°F	6.99	6.3"	6.99
200°F	7.19	6.8"	7.19
210°F	7.40	7.3"	7.40
220°F	7.62	7.8"	7.62
230°F	7.85	8.3"	7.85
240°F	8.09	8.8"	8.09
250°F	8.34	9.3"	8.34
260°F	8.59	9.8"	8.59
270°F	8.85	10.3"	8.85
280°F	9.11	10.8"	9.11
290°F	9.38	11.3"	9.38
300°F	9.65	11.8"	9.65

TABLE 3
ANTENNA CONDUCTOR TENSILE STRENGTHS ALONG 4-85°F WIND

TEMP	TENSION SAG	TENSION SAG	TENSION SAG
°F	TONS	FT	TONS
60°F	13.21	0.5"	13.21
70°F	10.75	0.75"	10.75
80°F	9.00	1.0"	9.00
90°F	7.76	1.4"	7.76
100°F	6.98	1.8"	6.98
110°F	6.59	2.3"	6.59
120°F	6.41	2.8"	6.41
130°F	6.37	3.3"	6.37
140°F	6.38	3.8"	6.38
150°F	6.43	4.3"	6.43
160°F	6.52	4.8"	6.52
170°F	6.65	5.3"	6.65
180°F	6.81	5.8"	6.81
190°F	6.99	6.3"	6.99
200°F	7.19	6.8"	7.19
210°F	7.40	7.3"	7.40
220°F	7.62	7.8"	7.62
230°F	7.85	8.3"	7.85
240°F	8.09	8.8"	8.09
250°F	8.34	9.3"	8.34
260°F	8.59	9.8"	8.59
270°F	8.85	10.3"	8.85
280°F	9.11	10.8"	9.11
290°F	9.38	11.3"	9.38
300°F	9.65	11.8"	9.65

THIS SKETCH IS BASED ON PRELIMINARY ENGINEERING & IS SUBJECT TO CHANGE

REV. 4 CONSTRUCTION NOTES:
INSTALLATION: GENERAL CONTRACTOR TO BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.
GENERAL CONTRACTOR TO BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.
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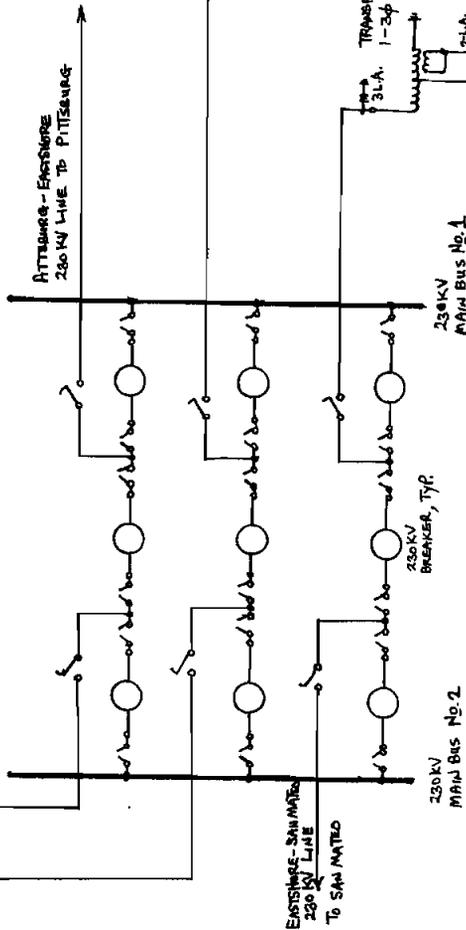
REVISIONS

NO.	DATE	DESCRIPTION
1	11-14-58	PRELIMINARY CONCEPTUAL ARRANGEMENT
2	11-14-58	ARRANGEMENT TYPED
3	11-14-58	ARRANGEMENT TYPED
4	11-14-58	ARRANGEMENT TYPED
5	11-14-58	ARRANGEMENT TYPED
6	11-14-58	ARRANGEMENT TYPED
7	11-14-58	ARRANGEMENT TYPED
8	11-14-58	ARRANGEMENT TYPED
9	11-14-58	ARRANGEMENT TYPED
10	11-14-58	ARRANGEMENT TYPED

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GENERAL CONTRACTOR TO BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES.

250KV GEA-TIE
LINES TO RUSSELL CITY
ENERGY CENTER



**THIS SKETCH IS
BASED ON PRELIMINARY
ENGINEERING AND IS
SUBJECT TO CHANGE**

TRANSFORMER 1
1-3φ, 250/230/120 MVA
HV 250/230KV, Y_n
LV 12.2KV Δ_n
L.T.C. 4/16 STEPS

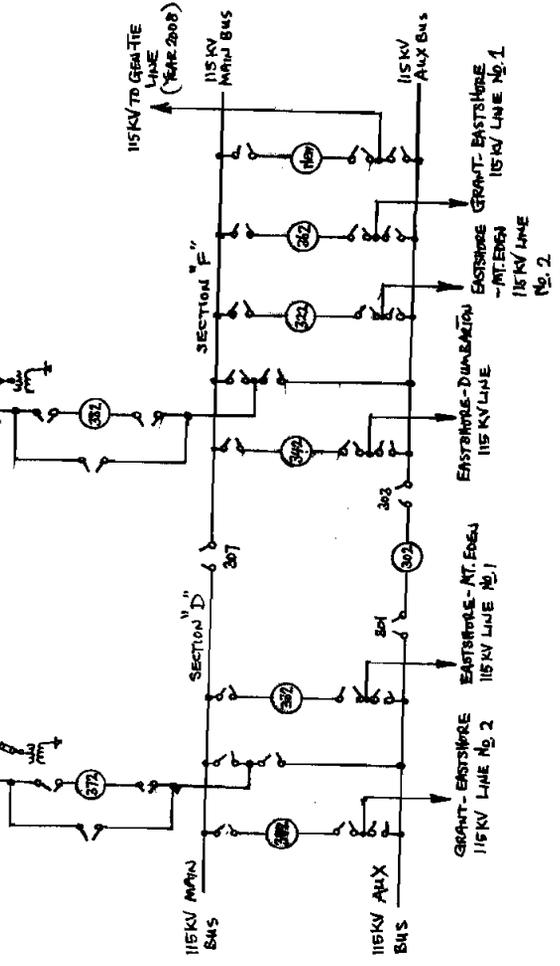
TRANSFORMER 2
1-3φ, 250/230/120 MVA
HV 250/230KV, Y_n
LV 12.2KV Δ_n
L.T.C. 4/16 STEPS

NOTES

1. ALL 230 KV BREAKERS ARE RATED 2000ACC 40KALC
ALL 250 KV AIR SWITCHES ARE RATED 2000ACC
2. LINE TRAPS, SCUTS, ETC., NOT SHOWN FOR
SIMPLICITY
3. SCOPE OF RCEC INCLUDES 230KV AND TRANSFORMER #2.

SKETCH # CYLO13007
SINGLE LINE DIAGRAM (SIMPLIFIED)
EASTSHORE SUBSTATION
RUSSELL CITY ENERGY CENTER PROJECT

REVISED 2-1-07 CYL





California Independent System Operator

Gary DeShazo
Director of Regional Transmission – North
(916) 608-5880

November 7, 2006

Mr. Chris Gillis
Generator Interconnection Services
Pacific Gas and Electric Company
PO Box 770000; Mail Code: N7L
San Francisco, CA 94177-0001

Subject: Russell City Energy Center Project
Final Interconnection Approval

Dear Mr. Gillis:

Calpine Corporation (Calpine) has proposed the Russell City Energy Center Project and the Russell City Energy Center Expansion Project (collectively called the Project), a combined cycle plant consisting of two combustion gas turbines and one steam turbine generator. The nominal net output to the Pacific Gas & Electric Company (PG&E) Transmission grid will be 600 MW. The commercial operational date is June 1, 2010.

Previously, PG&E issued Facilities Study (FS) reports for both projects under Amendment 39 on March 14 and March 16, 2006 that provided work scope and cost estimates for the interconnection of the Project. Following the issuance of the FS reports, and in accordance with Section 5 of FERC's Large Generation Interconnection Procedures (LGIP), the Project transitioned from the Amendment 39 process to the Large Generator Interconnection Procedures (LGIP). On April 4, 2006, Calpine requested PG&E to engineer, procure, construct, own and maintain the generator tie lines for the Project and change the Commercial Operation Date from July 2008 to June 1, 2010. On April 7, 2006, the California Independent System Operator (CAISO) and PG&E agreed that these changes were not Material Modifications pursuant to Section 4.4 of the LGIP and that a re-study was acceptable under the terms of Section 8.5 of the LGIP. Consequently, the Interconnection Facilities Study (IFAS) Plan was issued and agreed upon to determine the work scope and cost estimates for the generation tie line facilities assuming PG&E would engineer, procure, construct, own and maintain these Interconnection Facilities.

Based on the results of this FS Re-Study, the CAISO is granting final interconnection approval to the Russell City Energy Center Project.

Please note that this letter approving the interconnection of the project allows the project to connect to the CAISO Controlled Grid and to be eligible to deliver the project's output using available transmission. However, it does not establish the generation project's level of deliverability for purposes of determining its Net Qualifying Capacity under the CAISO Tariff and in accordance with CPUC-adopted Resource Adequacy Rules. Therefore, this letter makes no representation, and Calpeak cannot rely on any statements herein, regarding the ability, or amount, of the output of the project to be eligible to sell Resource Adequacy Capacity. We encourage you to follow the baseline deliverability studies ongoing at the CAISO. For more information on generation deliverability, please reference the web links provided in the attachment to this letter.

If you have questions about the CAISO review of this study, please contact Larry Tobias at (916) 608-5763 (LTobias@caiso.com) or myself at (916) 608-5880 (GDeShazo@caiso.com).

Sincerely,



Gary DeShazo
Director of Regional Transmission – North

cc: Mike Hatfield (Calpine via e-mail [mailto: mihatfield@calpine.com](mailto:mihatfield@calpine.com))

Mark Esguerra (PG&E via e-mail, [mailto: PME8@pge.com](mailto:PME8@pge.com))
Art McAuley (PG&E via e-mail, [mailto: AKM3@pge.com](mailto:AKM3@pge.com))
Madeleine Aldridge (PG&E via e-mail, [mailto: MEG5@pge.com](mailto:MEG5@pge.com))
Chris Gillis (PG&E via e-mail, [mailto: Cxql@pge.com](mailto:Cxql@pge.com))
Curt Irwin (PG&E via e-mail, [mailto: CPI3@pge.com](mailto:CPI3@pge.com))

Armando Perez (ISO)
Dariush Shirmohammadi (ISO)
Judy Nickel (ISO via e-mail)
Dennis Peters (ISO via e-mail)
Tom French (ISO via e-mail)
Regional Transmission - North (ISO via e-mail)

Attachment

Project Overview:

The Project will consist of two gas turbine generators each rated at 180 MW and one steam turbine generator rated at 254 MW for a total output of 614 MW. The plant auxiliary load is 14 MW. The total net output to the PG&E transmission grid of the combined cycle Russell City Energy Center will be 600 MW. Each generator will have a three-phase 18/230 kV step-up transformer. The Project will be connected to PG&E's 230 kV bus at East Shore Substation in the city of Hayward, California via two 230 kV generator tie lines that will be owned and maintained by PG&E. The Commercial Operation Date is June 1, 2010.

Below is a summary of the Facilities Study (FS) Report

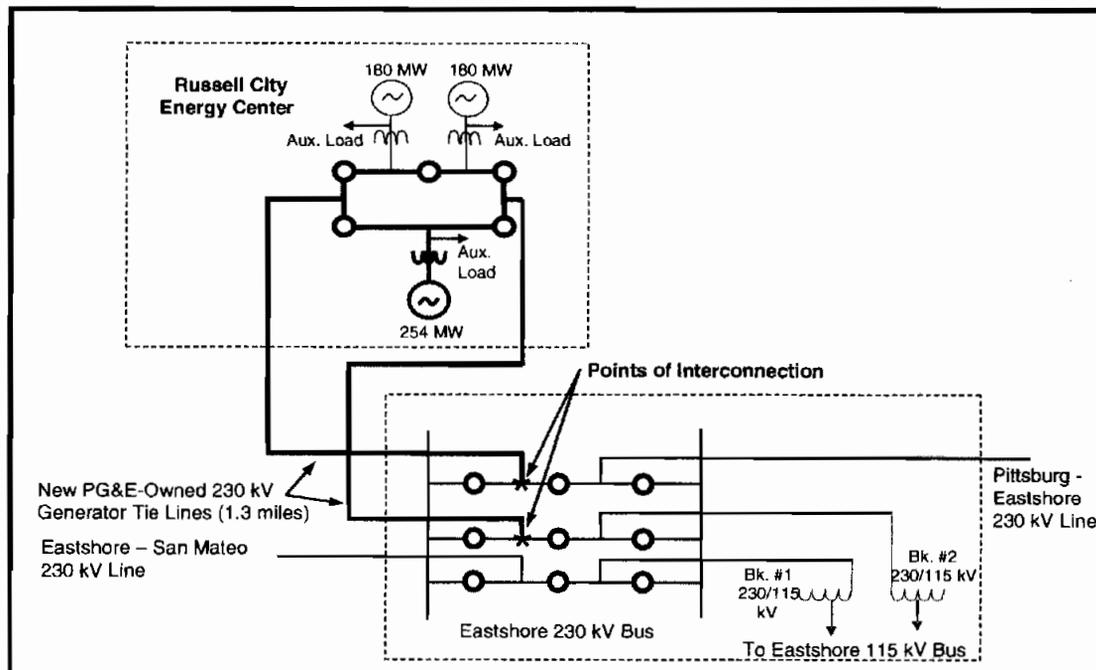
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- Providing transmission interconnection from the Project to the Point of Interconnection which includes a double-circuit 230 kV generator tie line from the RCEC to East Shore Substation.
- Install two line disconnect switches and associated substation construction to the point of interconnection.
- Providing a pre-parallel inspection, testing, SCADA, EMS setup, engineering support, etc.

The Network Upgrade facilities work scope consists of:

- Reconductoring the East Shore-San Mateo 230 kV line
- Reconductoring the East Shore-Dumbarton 115 kV line.
- Reconfigure the East Shore 230 kV bus to a breaker-and-a-half scheme
- Protective relay replacement at San Mateo and Pittsburg Substations.
- Providing a pre-parallel inspection, testing, SCADA, EMS setup, engineering support, etc.

The figure below shows the approximate location of the Project and the transmission facilities in the area. The entire 230 kV generator tie line will be located within PG&E's existing Grant – East Shore 115 kV right-of-way, with the exception of an approximate 500 foot section from the PG&E right-of-way to the Project, where additional right of way must be acquired.



Jeri Scott - FW: RCEC - Responses from PG&E to Follow-up Transmission Questions

From: <Doug.Davy@CH2M.com>
To: <Jscott@energy.state.ca.us>, <glw@eslawfirm.com>
Date: 2/2/2007 10:38 AM
Subject: FW: RCEC - Responses from PG&E to Follow-up Transmission Questions

Jeri,

Here is a copy of a an e-mail that Jim McLucas of Calpine has sent to Ajoy Guha in response to his informal questions regarding transmission system engineering.

Thanks very much,

Doug Davy
Senior Project Manager
CH2M HILL
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833
(916) 286-0278
ddavy@ch2m.com

From: Jim McLucas [<mailto:jmclucas@calpine.com>]
Sent: February 02, 2007 10:15 AM
To: Ajoy Guha (CEC)
Cc: Michael Hatfield; Davy, Doug/SAC; Gregg Wheatland (glw@eslawfirm.com); Alan Roth
Subject: RCEC - Responses from PG&E to Follow-up Transmission Questions

Ajoy -

Attached are responses from PG&E addressing your follow-up questions to our previous data responses pertaining to transmission. Also attached is a copy of the referenced November 7, 2006 CAISO approval letter. If you have any additional questions, please give me a call.

Thanks!

Jim McLucas

Manager, Water Technology & Chemical Operations

Calpine Corporation

P.O. Box 551

Pittsburg, California 94565

925/431-1304

925/431-1308 (fax)

925/570-0835 (mobile)

jmclucas@calpine.com

From: Gillis, Chris (ET) [<mailto:CxGl@pge.com>]
Sent: Wednesday, January 31, 2007 2:32 PM
To: Michael Hatfield
Cc: Lightstone, Michael (ET); Lambert, Jo L (Law)
Subject: FW: RCEC - Draft Transmission Responses for PG&E

Mike,

The attached files are in response to the CEC's recent data request of the Russell City Energy Center project. Our attached response is based on having reviewed and analyzed the CEC concerns with the most recent studies (ISO Approved Facilities Study November 7th, 2006).

It is our understanding that you will, in turn, forward to the CEC.

If you have any questions please call me.

Sincerely,

Christopher Gillis
Pacific Gas & Electric
Generation Interconnection Services
Mail Code N 7 L
245 Market Street
San Francisco, CA. 94105-1702

Office: 415-973-3770
Fax: 415-973-3064
Email: CXGL@pge.com

From: Palomares, Arsenio (ET)
Sent: Wednesday, January 31, 2007 1:51 PM
To: Gillis, Chris (ET)
Cc: Lam, Chung (ET); Bhatia, Mohan (ET); Bonderud, Robert; Esguerra, P Mark (ET); Lambert, Jo L (Law); Lightstone, Michael (ET); Palomares, Arsenio (ET)
Subject: FW: RCEC - Draft Transmission Responses for PG&E

Chris,

Attached is the revised response incorporating the comments from the PG&E team. Also, attached are the sketches.

Thanks,

Arcy

The following information addresses the CEC staff's additional questions which you conveyed to us.

- Data Requests 45: A one line diagram for Eastshore Substation may be found on page 2 of the November 2, 2006 Interconnection Facilities Study Report (Re-Study). Sketch Eastshore_SL2009, based on preliminary engineering and subject to change, is attached. It shows the electrical single line of Eastshore Substation for and after the RCEC project. The equipment ratings, as currently planned, are as follows:
 - 230 kV bus: 3000 ACC for Main Bus 1 and Bus 2. 2000 ACC for each BAAH (breaker-and-a-half) bay
 - 230 kV circuit breakers: 2000 ACC, 40kA IC
 - 230 kV disconnect switches: 2000 ACC
 - 115kV/230kV transformers: 3-phase, autotransformer, 252/336/420 MVA, ONAN/ONAF/ONAF, HV 230/120kV Ground-Y, TV 13.2kV Grounded-Delta

Sketches RCEC_ESOD2008 and RCEC_ESOD2009, based on preliminary engineering and subject to change, are attached. Sketch RCEC_ESOD2008 shows the existing Eastshore Substation plus the replacement of the 230/115 kV Transformer No. 1 with one three-phase 420 MVA bank, under the PG&E Project No. P.01951, and the installation of one new 115 kV breaker position in 2008 for P0413 generation project. This sketch shows Eastshore Substation before the RCEC project. Sketch RCEC_ESOD2009 conceptually shows Eastshore Substation after the RCEC project. This sketch shows the approximate location of the fence line for the expanded substation. A detailed general arrangement drawing is not available at this time. However, we can confirm that our work to date shows that there is sufficient physical space available for the RCEC equipment. The existing 230 kV portion of the substation, which will be expanded to accommodate the interconnection of RCEC, is on the north side of the substation. The 230 kV portion of the substation will be expanded to the west.

- Data Request 46: We offer the following additional clarifications:
 - There are two 230kV transmission lines from Pittsburg, which come onto the Eastshore property from the east and then leave toward the west to the San Mateo Substation. One of these two lines presently loops into the Eastshore Substation; the other does not. This configuration will not change as a result of the interconnection of RCEC.
 - The existing Eastshore-San Mateo 230 kV transmission line will be reconducted to mitigate the impacts of the RCEC. The RCEC system impacts do not necessitate reconducting the existing Pittsburg-San Mateo 230 kV transmission line.
 - The last line of the response could be clarified by adding the underlined: "CAISO approved the interconnection of the RCEC Project, Project No. P02186, on 11/7/2006."

- Data Request 49: The project in question is that which may be found in the CAISO's queue position 63 dated 11/27/2006. The CAISO queue indicates that this project was withdrawn from the queue on January 4th, 2007. With this project withdrawn from the queue, the pre-project normal loading on the Contra-Costa-Delta Pumps 230 kV and Tesla-Delta Pumps 230 kV lines will be less and the post-project impacts associated with the RCEC would not be expected to result in an overload of the Contra-Costa-Delta Pumps 230 kV or Tesla-Delta Pumps 230 kV lines. CAISO and PG&E agreed that it is not necessary to perform an SIS re-study to evaluate the impacts to the RCEC project as a result of the 157.5 MW project being removed from the queue.
- Data Response 50: Although the RCEC project shows Category "C" emergency overloads on the Sobrante-Moraga 115 kV and Contra Costa-Brentwood 115 kV lines, no reconductoring proposed to mitigate these overloads as PG&E does not typically re-conductor for Category "C" overloads. Such overloads may be mitigated by a Special Protection Scheme (SPS) or other minor mitigation measures. An SPS may include protection upgrades (new relays, communications, RTU's, SCADA equipment, etc.) to automatically reduce the overloads for specific conditions such as the loss of multiple transmission lines. Other mitigation measures may include operator action, or manual generation curtailment, and may not include an SPS. In any event, the mitigation measures implemented to address these particular overloads will be confined to work within the existing fence lines of PG&E substations. These overloads were not overlooked in the Re-Study. The 1% overload on the Contra Costa-Brentwood 115 kV line was determined to be insignificant (i.e. within the accuracy of the study), whereas the 3% overload on the Sobrante-Moraga 115 kV line is addressed at the bottom of page 9 and top of page 10.
- Data Response 51. The Re-Study no longer includes the SPS identified in 2002. Circumstances have changed (projects dropped from the queue, generation and transmission projects were built, etc.). It would take a lot of time and effort to try to re-create the queue and other factors between 2001 and today. The important thing is that the previously identified SPS was not simply overlooked, but instead is no longer necessary.

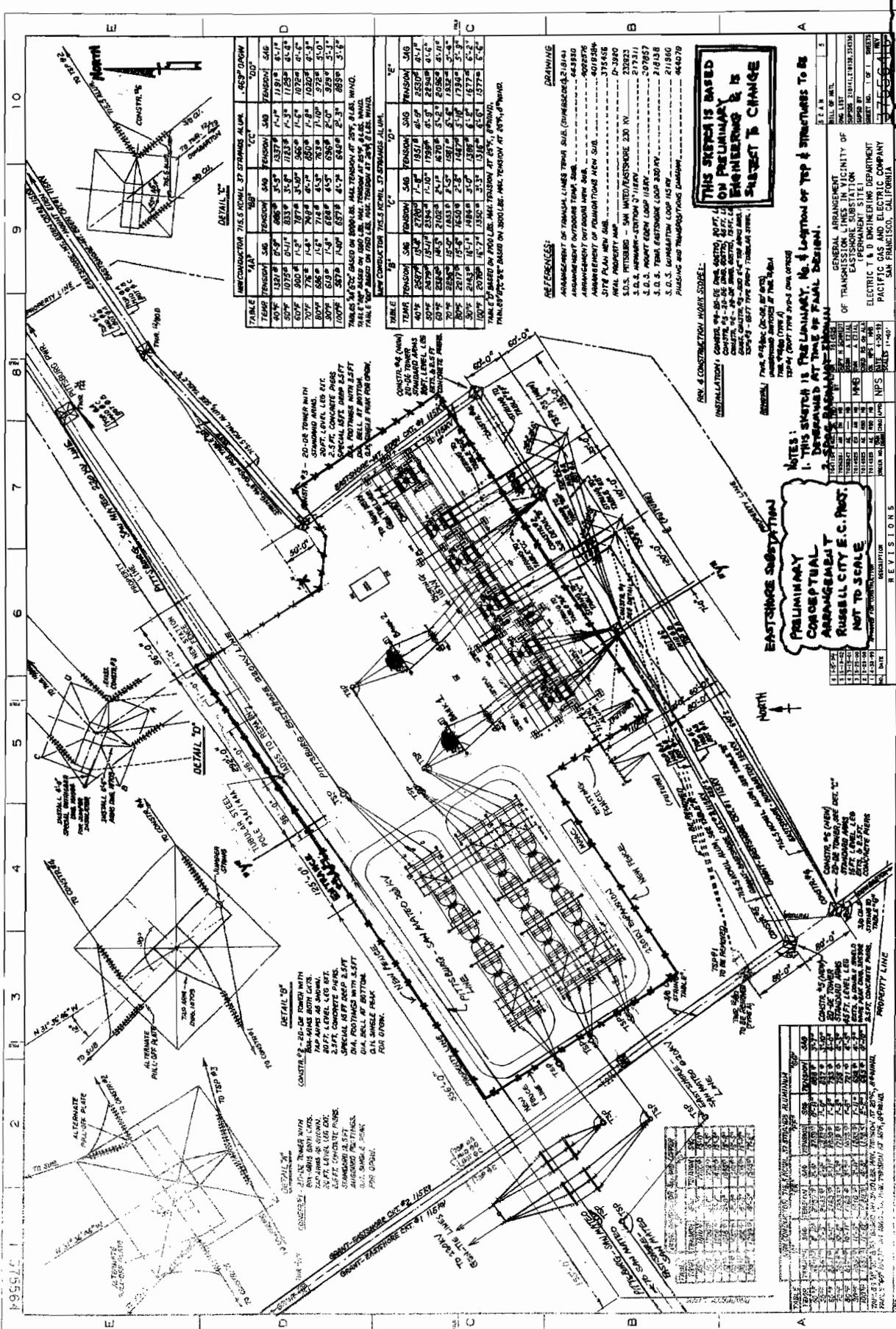


TABLE 1
CONCRETE TENSILE STRENGTH DATA

TEST NO.	DATE	STRENGTH (PSI)	STRENGTH (MPA)
1	10/15/54	4000	27.6
2	10/15/54	4000	27.6
3	10/15/54	4000	27.6
4	10/15/54	4000	27.6
5	10/15/54	4000	27.6
6	10/15/54	4000	27.6
7	10/15/54	4000	27.6
8	10/15/54	4000	27.6
9	10/15/54	4000	27.6
10	10/15/54	4000	27.6
11	10/15/54	4000	27.6
12	10/15/54	4000	27.6
13	10/15/54	4000	27.6
14	10/15/54	4000	27.6
15	10/15/54	4000	27.6
16	10/15/54	4000	27.6
17	10/15/54	4000	27.6
18	10/15/54	4000	27.6
19	10/15/54	4000	27.6
20	10/15/54	4000	27.6

TABLE 2
STEEL TENSILE STRENGTH DATA

TEST NO.	DATE	TENSILE (KSI)	TENSILE (MPA)	ELONGATION (%)
1	10/15/54	50	345	25
2	10/15/54	50	345	25
3	10/15/54	50	345	25
4	10/15/54	50	345	25
5	10/15/54	50	345	25
6	10/15/54	50	345	25
7	10/15/54	50	345	25
8	10/15/54	50	345	25
9	10/15/54	50	345	25
10	10/15/54	50	345	25
11	10/15/54	50	345	25
12	10/15/54	50	345	25
13	10/15/54	50	345	25
14	10/15/54	50	345	25
15	10/15/54	50	345	25
16	10/15/54	50	345	25
17	10/15/54	50	345	25
18	10/15/54	50	345	25
19	10/15/54	50	345	25
20	10/15/54	50	345	25

REFERENCES:
 1. AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC. (AISC) - 1950 SPECIFICATIONS FOR STRUCTURAL STEEL AND BOLTS, BRACKETS AND WELDS.
 2. AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC. (AISC) - 1950 SPECIFICATIONS FOR STRUCTURAL STEEL AND BOLTS, BRACKETS AND WELDS.
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THIS SKETCH IS BASED ON PRELIMINARY ENGINEERING & IS SUBJECT TO CHANGE

NOTES:
 1. THIS SKETCH IS PRELIMINARY AND IS SUBJECT TO CHANGE.
 2. ALL DIMENSIONS ARE IN FEET AND INCHES.
 3. ALL DIMENSIONS ARE IN FEET AND INCHES.
 4. ALL DIMENSIONS ARE IN FEET AND INCHES.
 5. ALL DIMENSIONS ARE IN FEET AND INCHES.

REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

GENERAL ARRANGEMENT OF TRANSMISSION LINE TOWER AT EASTSHORE SUBSTATION (PERMANENT SITE)
 ELECTRIC T & D ENGINEERING DEPARTMENT
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

SCALE: 1" = 20'-0"

DATE: 10/15/54

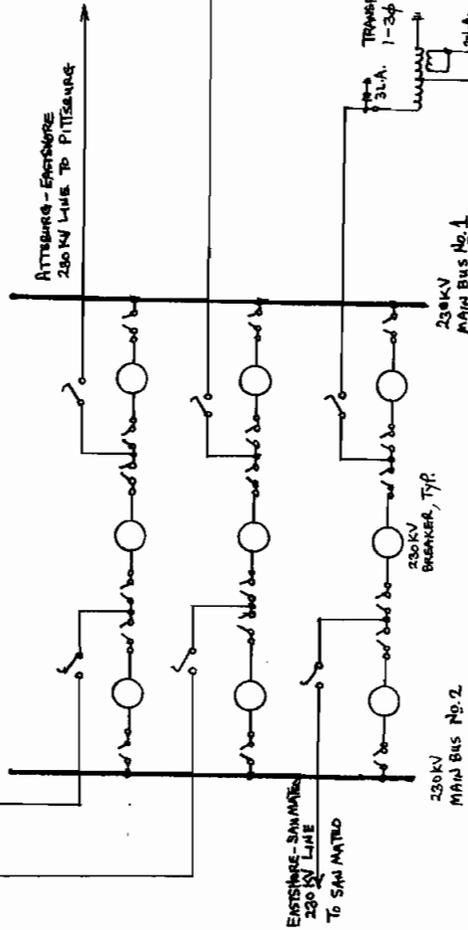
PROJECT NO. 100-1000

BY: [Signature]

REC-ESD 2004

10 9 8 7 6 5 4 3 2 1
 E D C B A

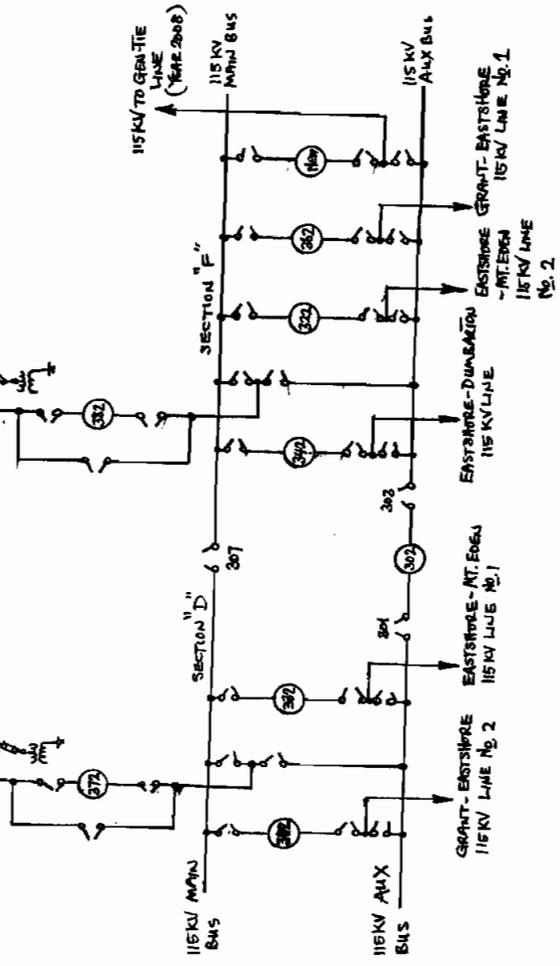
250KV Gea-Tie
LINES TO RUSSELL CITY
ENERGY CENTER



**THIS SKETCH IS
BASED ON PRELIMINARY
ENGINEERING AND IS
SUBJECT TO CHANGE.**

TRANSFORMER 1
1-3φ, 250/250/450 MVA
HV 250/250KV, Yx
LV 15.2KV Δ₄
L.T.C. 4/16 STEPS

TRANSFORMER 2
1-3φ, 250/250/450 MVA
HV 250/250KV, Yx
LV 13.2KV Δ₄
L.T.C. 4/16 STEPS



- NOTES**
1. ALL 250 KV BREAKERS ARE RATED 2000ACC, 40KALC.
ALL 250 KV AIR SWITCHES ARE RATED 2000ACC
 2. LINE TRAPS, COUITS, ETC., NOT SHOWN FOR
SIMPLICITY
 3. SCOPE OF RCEC INCLUDES 250KV AND TRANSFORMER #2.

SKETCH # CYLD13007
SINGLE LINE DIAGRAM (SIMPLIFIED)
EASTSHORE SUBSTATION
RUSSELL CITY ENERGY CENTER PROJECT

REVISED 2-1-07 CYL



California Independent System Operator

Gary DeShazo
Director of Regional Transmission – North
(916) 608-5880

November 7, 2006

Mr. Chris Gillis
Generator Interconnection Services
Pacific Gas and Electric Company
PO Box 770000; Mail Code: N7L
San Francisco, CA 94177-0001

Subject: Russell City Energy Center Project
Final Interconnection Approval

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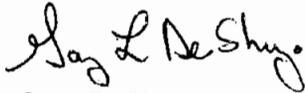
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Sincerely,



Gary DeShazo
Director of Regional Transmission – North

cc: Mike Hatfield (Calpine via e-mail [mailto: mihatfield@calpine.com](mailto:mihatfield@calpine.com))

Mark Esguerra (PG&E via e-mail, [mailto: PME8@pge.com](mailto:PME8@pge.com))
Art McAuley (PG&E via e-mail, [mailto: AKM3@pge.com](mailto:AKM3@pge.com))
Madeleine Aldridge (PG&E via e-mail, [mailto: MEG5@pge.com](mailto:MEG5@pge.com))
Chris Gillis (PG&E via e-mail, [mailto: Cxgl@pge.com](mailto:Cxgl@pge.com))
Curt Irwin (PG&E via e-mail, [mailto: CPI3@pge.com](mailto:CPI3@pge.com))

Armando Perez (ISO)
Dariush Shirmohammadi (ISO)
Judy Nickel (ISO via e-mail)
Dennis Peters (ISO via e-mail)
Tom French (ISO via e-mail)
Regional Transmission - North (ISO via e-mail)

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