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July 19, 2007
338307

DOCKET	
06-AFC-4	
DATE	JUL 19 2007
RECD.	JUL 19 2007

Dr. James Reede
1516 Ninth Street
Sacramento, CA 95814-5512

RE: Informal Data Response, Set 1C
Vernon Power Project (06-AFC-4)

On behalf of the City of Vernon, please find attached 12 copies and one original of the Informal Data Response, Set 1C. We are also filing copies of this data response electronically.

Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

c: Project File
CEC (w/ attachments)
Proof of Service List (w/o attachments)

**VERNON POWER PLANT
(06-AFC-4)**

**INFORMAL DATA RESPONSE,
SET 1C**
(TSE-1, 610 MW Facility Study)

Submitted by
City of Vernon

July 19, 2007



2485 Natomas Park Drive, Suite 600
Sacramento, California 95833-2937

**VERNON POWER PLANT
(06-AFC-4)
INFORMAL DATA RESPONSES, SET 1C**

Technical Area: Transmission System Engineering

CEC Author: Ajoy Guha, P.E.

TSE-1 The AFC is for 914 MW net generation output from the proposed Vernon Power Plant (VPP) with a target on-line date of third quarter of 2009. Two System Impact Studies (SIS), one for 610 MW output and the other for 890 MW output (stated as incomplete study), were submitted to the Commission and the studies were conducted under 2008 system conditions instead of 2009 system conditions. Appendix B(b)(2)(C).

In order to demonstrate conformance or non-conformance with the NERC/WSCC, California Independent System Operator (Cal-ISO) and/or Utility planning standards and reliability criteria, please submit a new System Impact study for the nominal 914 MW Vernon Power Plant (VPP) under 2009 summer peak and spring system conditions.

Response: The City of Vernon has received the following document from Cal-ISO:

- 610 MW Interconnection Facilities Study Report, dated May 31, 2007. (Attachment TSE-1C).

Interconnection Facilities Study Report - Final

Generation Interconnection

City of Vernon

Vernon Power Project – 610 MW



California ISO
Your Link to Power

May 31, 2007

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I. Executive Summary

The City of Vernon applied to the California Independent System Operator (CAISO) for the interconnection of 610MW of generation from their Vernon Power Project (VPP or “Project”) to the CAISO Controlled Grid.

The original application for 890MW was revised to 639MW with a plant auxiliary load of 29MW resulting in a net generation output of 610MW.

VPP will be connected to the Laguna Bell Substation via two 4 mile radial Laguna Bell – VPP No.1 & No.2 220kV Generation Tie and Transmission Lines defined as follows:

- Laguna Bell – VPP No.1 & No.2 220kV Generation Tie Lines are the segments of lines from the VPP Generating Station up to and including the last structure outside the Laguna Bell Substation Perimeter Fence.
- Laguna Bell – VPP No.1 & No.2 220kV Transmission Lines are the segments of lines inside the Laguna Bell Substation Perimeter Fence.

This Facilities Study Report addresses exclusively the Laguna Bell – VPP No.1 & No.2 220kV Transmission Lines.

The 220kV Generation Tie Lines and any associated work will be addressed in a future document.

NOTE:

During the preparation of the Facilities Study it was concluded that the installation of the 220kV Lines inside the Laguna Bell Substation perimeter fence would require the undergrounding of eight 500 Ft. sections of existing overhead 66kV Lines presently running parallel to the west station fence.

In addition, pending additional evaluation of the sixteen 66kV circuit breakers at the line positions terminating these eight lines, it is assumed at this time that such breakers would need to be replaced with new equipment adequate to withstand the underground cable charging currents.

The City of Vernon requested an interconnection date of March 31, 2009.

A System Impact Study (SIS) was prepared to address the impact of the new generation to the CAISO Controlled Grid.

SEE EXHIBIT A: SYSTEM IMPACT STUDY - EXECUTIVE SUMMARY.

II. System Impact Study Results

The SIS considered a total of 114 potential projects, presently ahead of VPP in the Interconnection Application Queue, as already interconnected to the SCE System.

SEE EXHIBIT B: SCE PROJECT QUEUE.

The SIS concluded that the present CAISO Controlled Grid is not adequate to support the proposed generation.

The SIS determined that the new generation would not cause any Base Case or Single Contingency overloads but it would aggravate one pre-existing double contingency overload on the Lighthipe – Mesa 220kV T/L under the simultaneous outage of the Laguna Bell – Rio Hondo and the Mesa – Redondo 220kV T/L's from 2424A (101%) to 2671A (111%).

Proposed Solution: Replace 2400A Wave Trap at Mesa Substation with new 3000A Rated to increase N – 2 line rating to 3210A

In addition the SIS identified a total of ten 220kV locations where the new generation causes the Three-Phase Short Circuit Duties to go up by 0.1kA or more and also three 500kV and twenty nine 220kV locations where the new generation causes the Single Phase to Ground Short Circuit Duties to go up by 0.1kA or more and requested that all circuit breakers at these locations be investigated.

The three 500kV and twenty nine 220kV locations identified on the SIS are:

500kV:

Rancho Vista Serrano Vincent

220kV:

Arcogen	Barre	Center	Del Amo	Devers	El Nido
El Segundo	Ellis	Eiwanda	Hinson	Hunt. Bch.	La Fresa
Laguna Bell	Lewis	Lighthipe	Long Bch.	Mesa	Mira Loma
Olinda	Pardee	Pisgah	Rancho Vista	Redondo	Rio Hondo
Serrano	Sylmar	Villa Park	Vincent	Walnut	

The SIS did not analyze the SCE Sub-Transmission System but requested that this evaluation be performed during the Facilities Study.

The SIS concluded that the system remained stable and no transient or post-transient stability problems were identified.

The SIS concluded that a Facilities Study would be required to determine the scope of work and cost estimates for all elements required to provide the 220kV Transmission Interconnection and any required System Upgrades.

III. Facilities Study Assumptions

- A. The Laguna Bell – VPP No.1 & No.2 220kV Generation Tie Lines from the Generating Facility to the last structure outside the SCE Laguna Bell Substation perimeter fence will be addressed in a future document and are not included in the Facilities Study.
- B. The Laguna Bell – VPP No.1 & No.2 220kV Generation Tie Lines will be equipped with Optical Ground Wire (OPGW) to provide one of the two telecommunication paths required for the line protection scheme. The cost of the OPGW will be included in the estimate of the lines and is not included in the Facilities Study.
- C. The Laguna Bell – VPP No.1 & No.2 220kV Transmission Lines, inside the Laguna Bell Substation perimeter fence and the spans of conductors to the last transmission structure outside the substation fence will be installed by SCE and they are included in the Facilities Study.

- D. As requested by VPP, both Laguna Bell – VPP No.1 & No.2 220kV Generation Tie Lines will enter the Laguna Bell Substation from its North / West corner.
- This alignment requires the relocation of the existing Goodrich 220kV T/L from its existing Position 11 to Position 7 and the detachment of the Mesa – Redondo and Lighthipe – Mesa 220kV T/L's presently running through the station at Positions 13 and 7.
- All the required relocations of existing 220kV Transmission Lines plus the required undergrounding of existing 66kV Lines inside the Laguna Bell Substation perimeter fence will be performed by SCE and they are included in the Facilities Study.
- E. All required ISO metering equipment at the Generating Facility will be provided by VPP and is not included in the Facilities Study.
- F. The following line protection equipment, to be installed by VPP at the Generating Facility termination point of the 220kV Generation Tie Lines will be specified by SCE and provided by VPP and is not included in the Facilities Study.
- Two G.E. L90 Current Differential Relays with dedicated digital communication channels to Laguna Bell Substation.
 - Two SEL 311L Current Differential Relays with separate digital communication channels to Laguna Bell Substation.
- G. The required RTU to be installed at the Generating Facility will be installed by SCE and it is included in the Facilities Study.

IV. Facilities Study Scope and Cost Estimate

IV – A Facilities Study Scope

Pursuant to FERC's orders 2006-A (Small Generators) and 2003-A (Large Generators) all Facilities Studies are required to provide the customer with its "maximum possible funding exposure", which shall include the costs of upgrades that are reasonably allocable to the Interconnection Customer at the time the estimate is made, and the costs of any upgrades not yet constructed that were assumed in the interconnection studies for the Interconnection Customer but are, at the time of the estimate, an obligation of an entity other than the Interconnection Customer.

To comply with the FERC orders, the Scope of Work and Cost Estimate for all elements required for the interconnection are presented for the following two cases:

CASE A: All facilities required exclusively by the Project

And

CASE B: All additional facilities that may be required by the Project

The facilities included on Case B are those additional facilities required to remedy situations caused by earlier Projects, placed ahead of the Project in the Application Queue, and are expected to be implemented by them.

However, in the event that any of these earlier Projects withdraws their Application, the Project may become responsible for any or all of these additional facilities.

CASE A:

- Laguna Bell Sub. – 220kV Reconfigure the 220kV Switchyard and install two new 220kV Line Positions to terminate the VPP No.1 & No.2 220kV T/L's.
- Laguna Bell Substation: Replace two 220kV CB's
- Mesa Substation: Upgrade four 220kV CB's
- VPP No.1 & No.2 220kV T/L's Install segments of new lines from the first structure outside Laguna Bell Sub. to the station Switchyard.
- Goodrich – Lag. Bell 220kV T/L Relocate termination at Laguna Bell Substation.
- Mesa – Redondo 220kV T/L Raise support structure at Laguna Bell Switchyard.
- Lighthipe – Mesa 220kV T/L Raise support structure at Laguna Bell Switchyard.
- Various 66kV Lines Underground eight sections of overhead 66kV Lines inside the Laguna Bell Substation perimeter fence.
- Telecommunications Install new circuits as required to support new line protection schemes and RTU.
- Power System Control Install new RTU at the Generating Facility and Expand existing RTU at Laguna Bell Substation.

CASE B:

- Mesa Sub. Replace Wave Trap on the Lighthipe Line Position.
- Etiwanda Gen. Station: Replace twenty four 220kV CB's and upgrade the 220kV Switchyard to 80kA Rating
- La Fresa Substation: Upgrade four 220kV CB's
- Laguna Bell Substation: Upgrade fourteen 220kV CB's
- Lugo Substation: Replace three and upgrade two 220kV CB's
- Mira Loma Substation: Replace twelve 220kV CB's and upgrade 220kV Switchyard to 80kA Rating
- Pardee Substation: Upgrade seven 220kV CB's
- Redondo Gen. Station: Upgrade twelve 220kV CB's
- Vincent Substation: Upgrade one 220kV CB

Circuit Breakers Evaluation:

The Facilities Study evaluated the Circuit Breakers short circuit capability at all locations where the Three-Phase and/or Single Phase to Ground SCD's were increased by 0.1kA or more as a result of the Project.

The evaluation included a total of twenty three 500kV CB's at two locations, four hundred and ninety four 220kV CB's at thirty six locations and one hundred and four 115kV CB's at eleven locations.

The replacements of 220kV Circuit Breakers at Etiwanda G.S and Mira Loma Substation are needed due to the Short Circuit Duty at each location increasing above the present 63kA Standard. This requires that both Switchyards be upgraded to a new 80kA Standard.

All 66kV Circuit Breakers are adequate and no replacements or upgrades are required.

FOR ADDITIONAL DETAIL REFER TO THE FOLLOWING EXHIBITS:

SEE EXHIBIT C: LAGUNA BELL SUBSTATION AND TRANSMISSION LINES.

SEE EXHIBIT D: FACILITIES STUDY – SCOPE DETAILS.

SEE EXHIBIT E: MAJOR EQUIPMENT AND RELAYS.

IV – B Facilities Study Cost Estimate

CASE A Identifies the cost of all facilities that are required exclusively by the Project.

CASE B Identifies the cost of all upgrades required that were triggered by earlier Applicants placed ahead of the Project in the Application Queue.

In the event that any Applicant, presently placed ahead of the Project in the Application Queue, withdraws its Application, the system would need to be re-evaluated. The new evaluation may conclude that the Project would now trigger any of these upgrades and would then become responsible for some or all of the upgrades identified on Case B.

The total estimated cost of all elements of the interconnection as identified above in the Facilities Study Scope is as follows:

CASE A:	\$16,163,000
CASE B (<u>May</u> be added to Case A):	<u>\$67,040,000</u>
POSSIBLE MAXIMUM COST EXPOSURE:	\$83,203,000

SEE EXHIBIT G: COST SUMMARY.

V. Conclusions

A. The estimated cost for the Interconnection is approximately \$16,163,000 for Case A with the potential additional cost of \$67,040,000 for Case B for a total Maximum Exposure of \$83,203,000.

B. The time required to complete all elements described in Case A of the proposed project will be 18 months after receiving project authorization and funding. This time includes engineering, material procurement and construction. This timeframe is subject to final verification by SCE of available resources at the time of the Project.

SEE EXHIBIT F: PROJECT SCHEDULE.

C. The time required to complete any elements described in Case B will be determined at the time when the need for such elements is determined.

D. An Amended Interconnection Study, pursuant to Section 12.2.4 of the Large Generator Interconnection Procedures, will be required to determine if any of the facilities specified on Case B would also be required to be placed in service prior to the interconnection of the Project.

E. The costs indicated in the attached tables are shown 2008 Dollars and are not firm. These are only preliminary estimates based on conceptual engineering and system unit costs, and are subject to change based on the final design and actual material costs. This Facilities Study and cost estimates as presented are valid for a period of 90 days.

- F. The estimated Project Cost will be reconciled to actual costs upon closure of the subject work orders. The necessary billing adjustments will be made at that time.

EXHIBIT A

SYSTEM IMPACT STUDY EXECUTIVE SUMMARY

**CITY OF VERNON
VERNON POWER PLANT (610 MW)**

SYSTEM IMPACT STUDY

June 23, 2006



**Prepared by
Jeffery L. Ellis, P.E.
(Consultant)**

Southern California Edison Company

Patricia L. Arons
Approved by: Patricia L. Arons
for

EXECUTIVE SUMMARY

Southern California Edison Company ("SCE") performed under direction of the California Independent System Operator ("CAISO"), an Interconnection System Impact Study ("SIS") as requested by the City of Vernon for a proposed Vernon Power Plant ("VPP") pursuant to the Interconnection System Impact Study Agreement entered into by SCE and Vernon on October 13, 2005. The initial VPP project was studied with a net plant output of 890 MW. However, the gross plant output was recently revised to 639 MW, plant auxiliary load of 29 MW and a net project output of 610 MW. The Project will interconnect to the SCE owned Laguna Bell 230 kV Substation. The project is scheduled to be in service by March of 2008.

The results of the System Impact Study will be used as the basis to determine project cost allocation for facility upgrades in the Facilities Study. *The study accuracy and the results for the assessment of the system adequacy are contingent on the accuracy of the technical data provided by Vernon.* Any changes from the attached data could void the study results.

The study was performed for two system conditions: a 2008 heavy summer one-in-ten load forecast and a 2008 light spring load forecast (65% of the heavy summer load).

The report provides detailed study assumptions and conditions of the system in which the study was conducted. Furthermore power flow contingencies for the SCE 230 kV system, post-transient governor power flow for 500 kV line contingencies, transient stability for significant 230 kV and 500 kV contingencies, and short-circuit duty assessments were completed for this study and are summarized below.

The objective of the System Impact Study is to determine whether SCE's transmission system can accommodate the proposed project. The study result indicated that the SCE system could not accommodate the proposed Vernon Power Plant Project without system modifications.

Power Flow Analysis

Studies identified that with addition of the VPP Project, the Lighthipe-Mesa 230 kV No.1 line was overloaded from 2424Amps/101% to 2671Amps/111% under the outages of Laguna Bell-Rio Hondo 230 kV No.1 line and Mesa-Redondo 230 kV No.1 line.

Post-Transient Power Flow Analysis

There were no post-transient power flow impacts identified with addition of the VPP Project.

Transient Stability Analysis

The transmission system remained in operating equilibrium throughout all transmission contingencies with inclusion of the Project. Also the VPP Project met the Low Voltage Ride-

Through criterion. None of the VPP generators tripped due to the adverse contingencies that were simulated. Phase-to-ground faults were not simulated in this SIS since previously studied projects that had a larger output did not reveal any problems.

Short-Circuit Analysis

In three-phase-to-ground SCD circuit breaker evaluation, the Vernon Power Plant triggered two circuit breakers on the Laguna Bell 230 kV bus with fault duties that increased by 0.1 kA from the pre-project case and exceeded its minimum breaker fault duty of 60%. Preliminary analysis indicated that the VPP Project contributed short circuit duties on several SCE owned circuit breakers, but did not trigger any upgrades or replacement. However, studies indicated that prior projects in the queue triggered upgrade and replacement of 62 SCE owned circuit breakers. Single-Line-to-Ground (SLG) circuit breaker evaluation will be performed in the Facilities Study.

Cost Responsibility

The *Nonbinding* Cost Estimate for the interconnection facilities and network upgrades triggered by the VPP Project is \$30 million. The *Nonbinding* Cost Estimate for VPP's maximum exposure for network upgrades triggered by prior projects is an additional \$17,123,000.

EXHIBIT B
SCE PROJECT QUEUE

SCE PROJECT QUE

Following is a list of the SCE project queue that is ahead of the City of Vernon Project. All projects listed were modeled in base cases used for the City of Vernon SIS analysis.

SCE Project Queue.

Project Name	Queue Position Date	Project Type
TOT005	06/10/97	Gen
WDT011	03/23/98	Gen
TOT022	09/30/98	Gen
TOT015	04/20/99	Gen
TOT004	05/17/99	Gen
TOT010	06/22/99	Gen
TOT018	07/21/99	Gen
WDT044	08/10/99	Gen
WDT014	09/09/99	Gen
WDT038	09/22/99	Gen
WDT040	10/06/99	Gen
WDT041	12/01/99	Gen
WDT042	01/07/00	Gen
TOT019	01/25/00	Gen
TOT021	01/25/00	Gen
TOT051	01/25/00	Gen
TOT032	06/14/00	Gen
TOT040	08/30/00	Gen
WDT069	09/12/00	Load
TOT041	10/06/00	Gen
WDT054	01/08/01	Gen
Viejo Substation	01/11/01	Trans
TOT048	02/16/01	Gen
TOT056	02/27/01	Gen
WDT073	03/01/01	Gen
WDT075	03/09/01	Gen
Sunset	04/03/01	Gen
WDT082	04/20/01	Gen
WDT080	04/24/01	Gen
TOT005	05/01/01	Gen
WDT086	05/08/01	Gen
TOT081	05/11/01	Trans
SCE Path 49 Series Cap Upgrade -	05/24/01	Trans
WDT053	06/14/01	Gen
TOT067	06/14/01	Gen
WDT092	07/03/01	Gen
7068	10/18/01	Gen
RMR	01/08/02	Trans
WDT098	01/14/02	Gen
TOT089	01/17/02	Trans
EAK049	04/29/02	Gen
TOT017	05/02/02	Gen

SCE PROJECT QUE

(continued) SCE Project Queue.

Project Name	Queue Position Date	Project Type
Valley 4th AA Bank (TRC)	05/13/02	Trans
WDT118	07/15/02	Gen
TOT094	07/26/02	Trans
WDT112	08/15/02	Gen
WDT018	08/26/02	Load
WDT019	08/26/02	Gen
WDT122	09/25/02	Load
TOT100	10/23/02	Gen
WDT133	12/12/02	Gen
TOT096	01/17/03	Gen
WDT124	02/11/03	Gen
TOT004	02/26/03	Gen
WDT082	02/28/03	Gen
WDT128	03/04/03	Load
TOT101	04/03/03	Trans
Reconductor Pastorja - Pardee (TRC)	04/03/03	Trans
TOT099	04/15/03	Gen
TOT079	04/22/03	Gen
TOT102	04/29/03	Gen
TOT106	05/06/03	Trans
TOT104	05/07/03	Trans
TOT108	09/04/03	Gen
Reconductor Mira Loma - Etiwanda (RMR)	09/19/03	Trans
WDT147	12/31/03	Gen
TOT109	01/06/04	Gen
WDT156	03/08/04	Gen
WDT157	03/08/04	Gen
TOT111	03/12/04	Gen
TOT112	03/12/04	Gen
WDT131	04/01/04	Gen
Split Devers - Mirage (ISO)	04/19/04	Trans
Upgrade Antelope A Bank No. 2 (ISO)	04/19/04	Trans
TOT113	05/11/04	Gen
Loop In Big Creek 3 - Springville & SVC at Rector (ISO Board)	06/18/04	Trans
TOT117	07/19/04	Gen
TOT116	07/20/04	Gen
WDT162	08/06/04	Load
Loop In Lugo - Serrano & SPS (ISO)	09/02/04	Trans

SCE PROJECT QUE

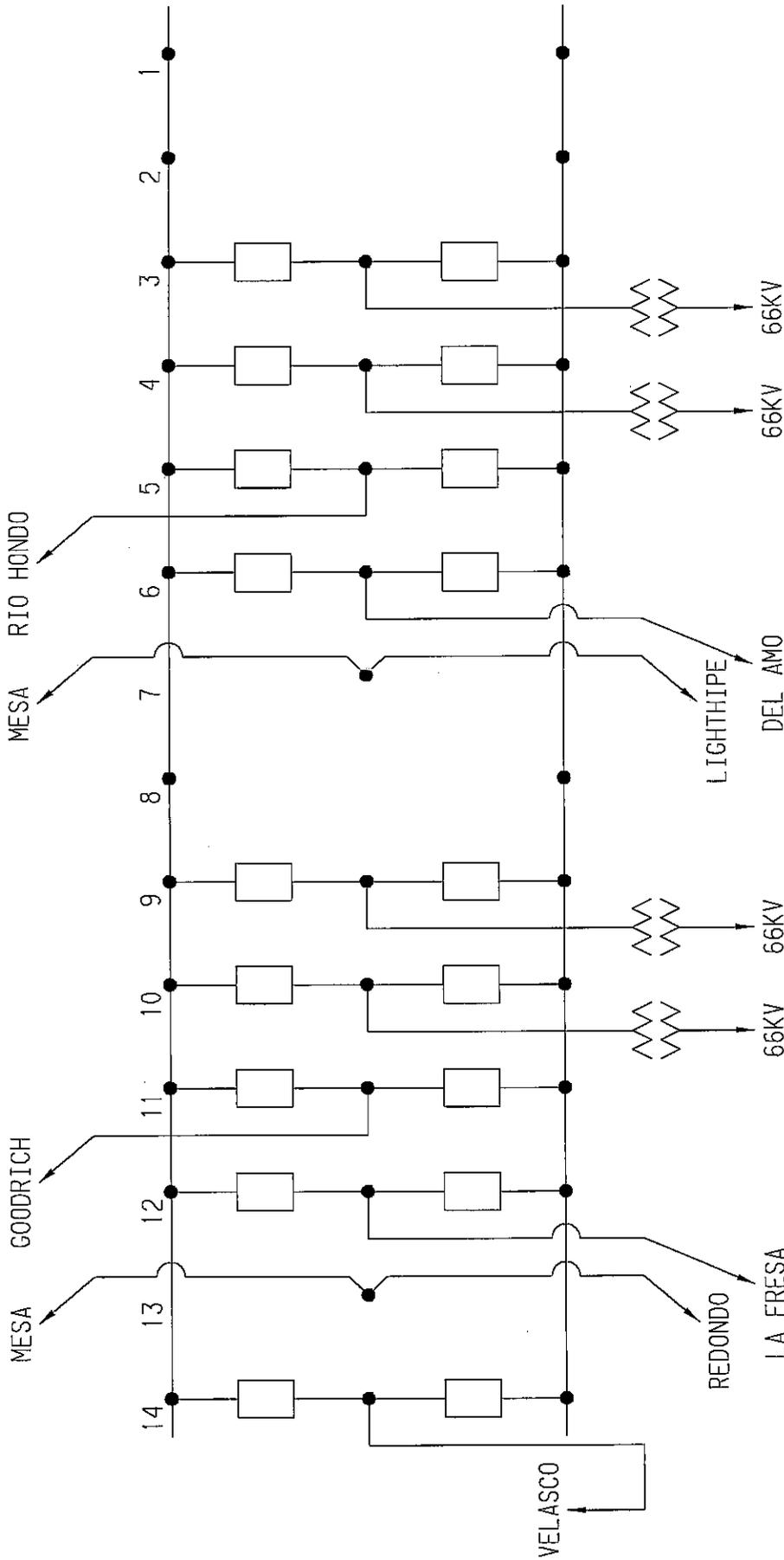
(continued) SCE Project Queue.

Project Name	Queue Position Date	Project Type
WDT164	10/21/04	Gen
New Rancho Vista Substation (ISO)	11/01/04	Trans
TOT119	11/18/04	Gen
WDT165	11/23/04	Gen
TOT120	12/14/04	Gen
ERC	01/06/05	Gen
TOT121	01/31/05	Gen
WDT169	02/08/05	Gen
WDT170	02/08/05	Gen
WDT176	02/10/05	Gen
TOT037	02/14/05	Gen
TOT127	02/22/05	Gen
TOT107	02/24/05	Trans
WDT179	03/18/05	Gen
WDT180	04/11/05	Load
TOT130	04/12/05	Gen
TOT128	04/15/05	Gen
WDT181	05/04/05	Gen
TOT138	05/06/05	Gen
TOT135	05/06/05	Gen
WDT182	05/06/05	Gen
TOT137	05/06/05	Gen
WDT188	05/13/05	Gen
TOT131	05/27/05	Gen
TOT139	06/07/05	Gen
TOT143	06/09/05	Gen
TOT142	06/15/05	Gen
TOT132	06/16/05	Gen
WDT187	06/17/05	Gen
WDT190	06/17/05	Gen
WDT192	06/17/05	Gen
TOT148	06/27/05	Gen
TOT072	07/13/05	Gen
Oak Valley 230/115 kV Substation	07/19/05	Trans
WDT206	08/22/05	Gen

EXHIBIT C

LAGUNA BELL SUBSTATION and TRANSMISSION LINES

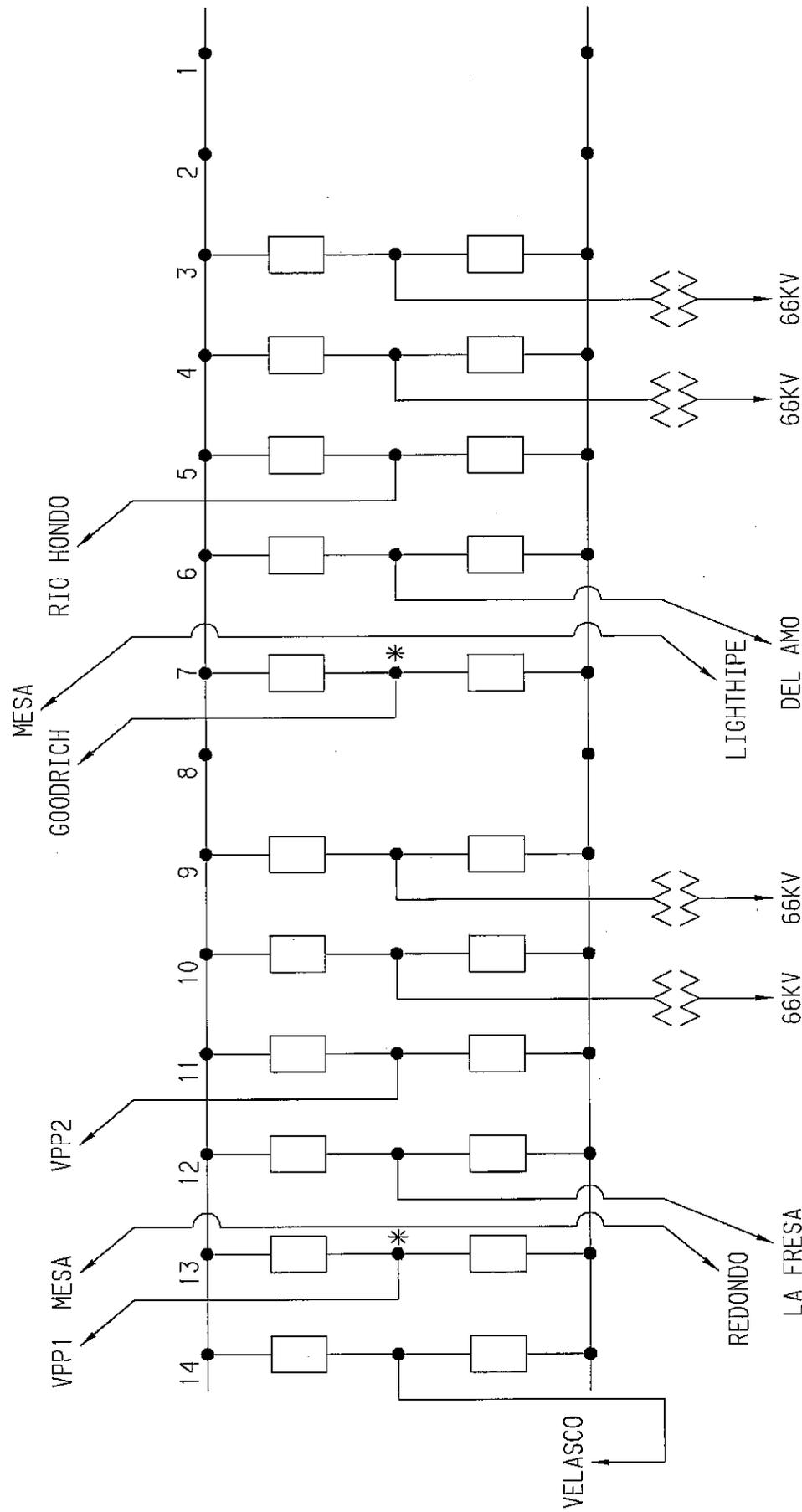
* REVISE ON AUTOCAD SYSTEM ONLY *



LAGUNA BELL SUBSTATION
 LAGUNA BELL 220KV
 PRESENT CONFIGURATION
 LAGUNA BELL 220 PRESENT.dwg



* REVISE ON AUTOCAD SYSTEM ONLY *



* DETACH AND RAISE
MESA TO LIGHTHIPE

* DETACH AND RAISE
MESA TO REDONDO

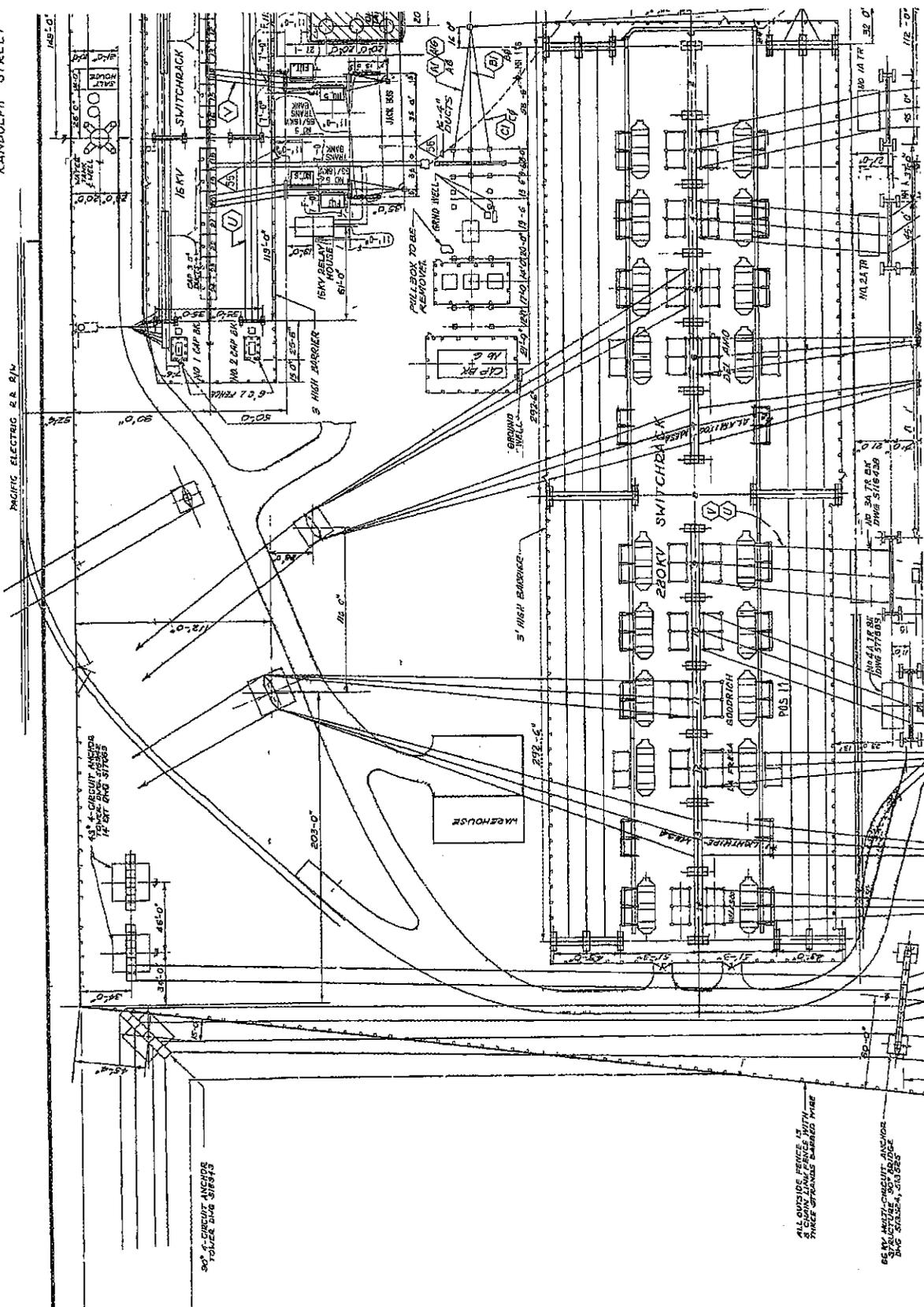
LAGUNA BELL SUBSTATION
 LAGUNA BELL 220KV
 PROPOSED CONFIGURATION
 FOR VPP FACILITIES STUDY
 LAGUNA BELL 220 PROPOSED.dwg



1 2 3 4 5 6 7 8 9 10 11 12

RANDOLPH STREET

PACIFIC ELECTRIC R.R. R/W



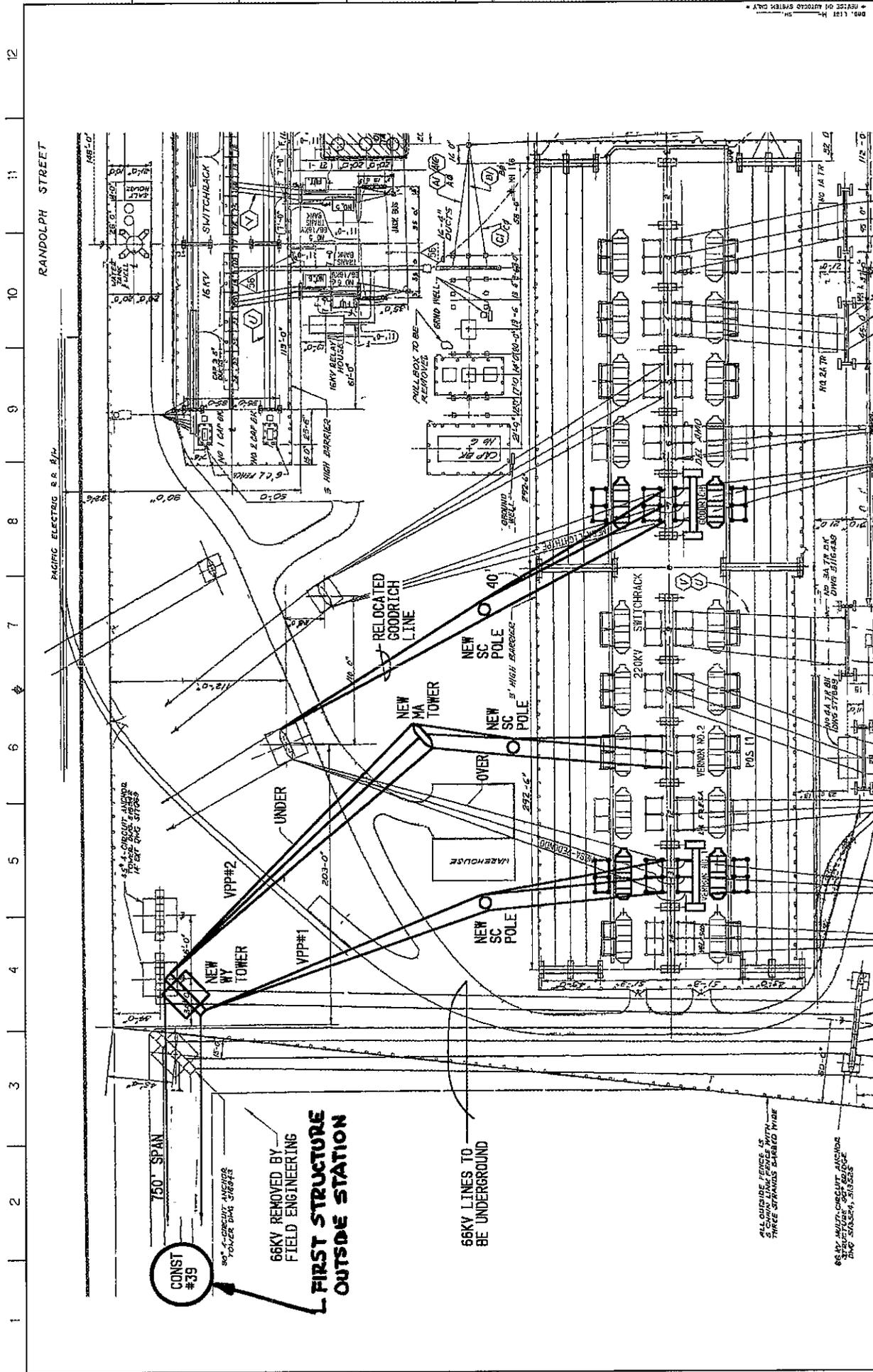
ALL OUTSIDE SERVICE IN 2' CROWN ALUM. PIPES WITH THREE SPINDLES BARRING THEM

66 KV ANTI-CIRCUIT ANCHORS STRUCTURE, 30' SQUARE 2" DIA. SPINDLES, 10' DIA. BBS

EDISON ELECTRIC COMPANY
 220KV SWITCHYARD
 PRESENT CONFIGURATION
 SHEET NO. 11-82-37
 SCALE: 1"=50'-0"

LAGUNA BELL T/L

DES. LIST "A" - REVISIONS ONLY



CONST #39

66KV REMOVED BY
FIELD ENGINEERING
FIRST STRUCTURE
OUTSIDE STATION

66KV LINES TO
BE UNDERGROUND

ALL CIRCULAR PIPES, IS
5" CIRCUMFERENCE, SHALL BE
THREE STRANDS EMBEDDED WIDE

66KV MULTI-CIRCUIT ANCHOR
STRUCTURES, SET OFF
DING STRUCTURE, SHOULD

A B C D E F G H

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RANDOLPH STREET

PACIFIC ELECTRIC R.R.

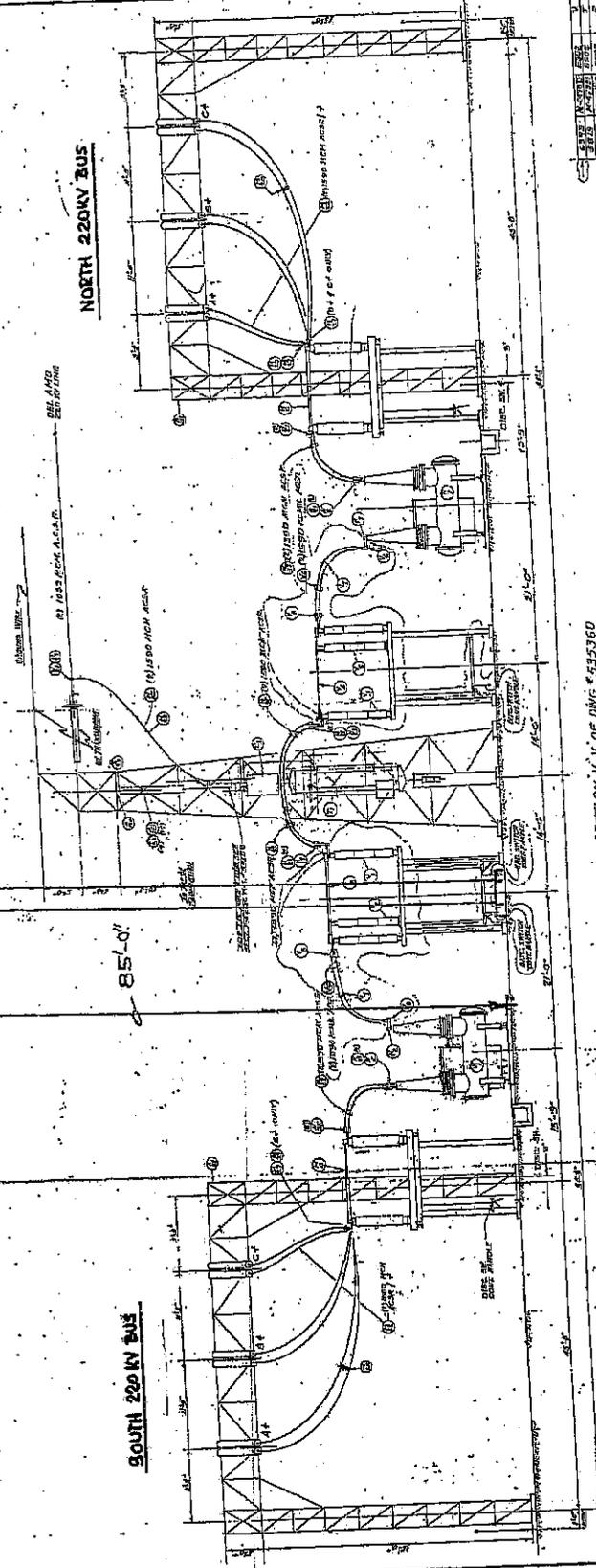
LOCATION: LAGUNA BELL SUBSTATION	SHEET NO.:
220KV SWITCHYARD PROPOSED CONFIGURATION	SCALE: 1"=40'-0"
EDISON	DATE: 11-15-57
BY: [Signature]	DATE: 11-15-57

LAGUNA BELL T/11

REVISIONS:
NO. 1: 11-15-57
NO. 2: 11-15-57
NO. 3: 11-15-57

ADDITIONAL LINE DEAD-END STRUCTURE TO BE INSTALLED AT POS. 13 & 7

NEW STRUCTURE 45'-0" WIDE x 85'-0" HIGH WITH 5'-0" OHSWM EXTENSION



SECTION VIEW OF ONE #535360 POS 76-220XLLIKE

NO.	DESCRIPTION	QTY	UNIT	PRICE	TOTAL
1
2
3
4
5
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Notes:
1. See Drawing # 535360 for General
2. See General Notes on Drawing # 535360.

541840.9

17-24

**VERNON POWER PROJECT – 610MW
FACILITIES STUDY – SCOPE DETAILS
CASE A**

A. Substations:

1. Laguna Bell Substation – 220kV Switchyard.

Reconfigure the 220kV switchyard as follows to install two additional 220kV line positions to terminate the proposed city of Vernon No.1 & No.2 220kV T/L's:

- Equip the existing vacant 220kV Position 13 to terminate the new Laguna Bell – VPP No.1 220kV T/L.
- Equip the existing vacant 220kV Position 7 and relocate the Goodrich 220kV T/L from Position 11 to Position 7
- Use existing equipment at Position 11 to terminate the new Laguna Bell – VPP No.2 220kV T/L.
- Install additional Dead – End Structures at existing Positions 13 and 7 to raise the existing Mesa – Redondo and the Lighthipe – Mesa 220kV T/L's so they may run through the station above the new lines terminating at these positions.

The following work is required on the 220kV Switchyard:

Position 7:

Install the following elements to equip the vacant 220kV Position 7 as a Double Breaker Position to terminate the relocated Goodrich 220kV T/L and elevate the existing Lighthipe – Mesa 220kV T/L presently attached to the existing 50 Ft. Dead End Structure at this location:

- One additional 85 Ft. High by 45 Ft. wide Dead End Structure – See attached sketch
- Two 220kV 3000A 63kA Circuit Breakers and corresponding foundation pad
- Four Group Operated Horizontally Mounted 220kV Disconnect Switches with support structures and foundations. One of them equipped with Line Grounding Attachment.
- Three 220kV Coupling Capacitor Voltage Transformers (CCVT's)
- One 220kV Wave Trap and Line Tuner
- Three 2-1590KCMIL 50 Ft. Line Drops with tie down structures and corresponding foundations. To be installed on existing 50 ft. Dead-End Structure.
- 2-1590KCMIL ACSR Conductors throughout the position

Position 13:

Install the following elements to equip the vacant 220kV Position 13 as a Double Breaker Position to terminate the new Vernon No.1 220kV Gen tie Line and elevate the existing Mesa – Redondo 220V T/L presently attached to the existing 50 Ft. Dead End Structure at this location:

- Same scope as Position 7 except without Wave Trap and Line Tuner

Position 11:

Remove the existing Wave Trap and Line Tuner and use all existing equipment to terminate the new Vernon No.2 220kV Gen Tie Line.

This will require the replacement of the west side tie down (the one with the wave trap) with a new one equipped with 2-1590KCMIL ACSR Conductors.

Existing Control Room:

220kV Bus Differential:

Install two new PVD21D Relays

Goodrich 220kV T/L:

The following Goodrich 220kV T/L Line Protection Relays must be disconnected to the Current and Potential circuits associated with equipment presently at Position 11 and re-connected to the new equipment being installed at Position 7.

- One CEY 51 & one CEY 52 Relays
- One JBCG 99 Relay

Also install two additional GE-C60 Breaker Management Relays for Breaker Failure

VPP No.1 & No.2 220kV T/L's:

Install the following relays at each one of the two lines:

- Two GE-C60 Breaker Management Relay (Breaker Failure)
- One GE-L90 Line Current Differential (Digital Channel)
- One SEL-311L Line Current Differential (Digital Channel)
- Provide Ethernet connection (IP Address) to both C60s, L90 and SEL-311L (connection provided thru SEL-2030)
- Four new 19" relay racks are required for the new 220kV Gen Tie Lines.

2. Laguna Bell Substation – Circuit Breakers.

Replace two 40kA 220kV CB's with new 50kA CB's.

3. Mesa Substation – Circuit Breakers.

Install six sets of Transient Recovery Voltage (TRV) Line to Ground Capacitors (Total of eighteen units) to upgrade four 50kA 220kV CB's to 63kA Rating.

B. Transmission Lines (220kV):

1. Laguna Bell – VPP No.1 & No.2 220kV Transmission Lines.

Install the segments of lines from the first structure outside the Laguna Bell Substation Perimeter Fence to the 220kV Switchyard Line Positions 13 and 11 (See Exhibit C).

This work requires the installation of two 2,000 Circuit Ft. segments of line with 2-1033KCMIL ACSR Conductors and the following four new structures:

- One double circuit dead-end lattice tower
- One single circuit dead-end lattice tower
- Two single circuit suspension tubular steel poles

This work also requires relocating the existing terminations of the Mesa – Redondo 220kV T/L from their existing Dead-End Structure at Position 13 to a new higher structure to be placed immediately south of the existing one.

2. Goodrich – Laguna Bell 220kV Transmission Line.

Relocate the existing line termination from the present Position 11 to Position 7.

This work requires the installation one single circuit suspension tubular steel pole.

This work also requires relocating the existing terminations of the Lighthipe – Mesa 220kV T/L from their existing Dead-End Structure at Position 7 to a new higher structure to be placed immediately south of the existing one.

C. Sub - Transmission Lines (66kV):

Underground the following eight segments of 66kV Lines inside the Laguna Bell Substation to clear the path for the installation of the new Laguna Bell – VPP No.1 & No.2 220kV T/L's.

1. Mesa – Laguna Bell – Narrows 66kV Line.

2. Laguna Bell – Newmark – Vail 66kV Line.

Remove approximately 400 Circuit Ft. of 653KCMIL ACSR and 400 Circuit Ft. of 954 SAC overhead conductors, three wood poles and one steel tower and install approximately 400 Double Circuit Ft. of duct and 66kV underground cable between the Laguna Bell Substation north property line and pole number 1269162E. This installation also requires one tubular steel riser pole and one vault.

3. Laguna Bell – Leonis No.1 66kV Line.

Remove approximately 500 Circuit Ft. of 653KCMIL ACSR overhead conductors and one wood pole and install approximately 500 Circuit Ft. of duct and 66kV underground cable between the Laguna Bell Substation north property line and Mile 0 – Bridge Tower 3. This installation also requires one tubular steel riser pole and one vault.

4. Laguna Bell – Federalgen – Fruitland 66kV Line.

Remove approximately 500 Circuit Ft. of 653KCMIL ACSR overhead conductors and one wood pole and install approximately 500 Circuit Ft. of duct and 66kV underground cable between the Laguna Bell Substation north property line and Mile 0 – Bridge Tower 3. This installation also requires one tubular steel riser pole and one vault.

5. Laguna Bell – Leonis No.2 66kV Line.

6. Laguna Bell – Ybarra 66kV Line.

Remove approximately 500 Double Circuit Ft. of 653KCMIL ACSR overhead conductors and install approximately 500 Double Circuit Ft. of duct and 66kV underground cable between the Laguna Bell Substation north property line and Mile 0 – Bridge Tower 3. This installation also requires one tubular steel riser pole and one vault.

7. Laguna Bell – Randolph No.1 66kV Line.

8. Laguna Bell – Fruitland – Randolph 66kV Line.

Remove approximately 500 Double Circuit Ft. of 653KCMIL ACSR overhead conductors and one Bridge Tower and install approximately 500 Double Circuit Ft. of duct and 66kV underground cable between the Laguna Bell Substation north property line and Mile 0 – Bridge Tower 3. This installation also requires one tubular steel riser pole and one vault.

D. Telecommunications:

1. Elements related to Line Protection.

Install approximately 7,000 Ft. of new fiber optic cable from a tap point to an existing SCE circuit to the VPP Generating Facility to provide one of the two telecommunication channels required for the two sets of Line Differential Relays. (The second fiber optic cable will be provided by installing an Optical Ground Wire on the double circuit structures of the Laguna Bell – VPP No.1 & No.2 220kV Generation Tie Lines.)

Also install data network equipment at Laguna Bell Sub. and two redundant SONET OC-1 optical multiplex systems, each consisting of two nodes (Four nodes total).

2. Elements related to Remote Terminal Unit (RTU).

Install one digital channel bank at the VPP Generating Facility and make incremental additions to the existing channel equipment at Lighthipe Substation Regional Control Center (RCC) equipment.

E. Power System Controls:

1. Main RTU at the VPP Generating Facility.

Install a new full size real-time Remote Terminal Unit (RTU) at the Generating Facility to monitor the following elements:

- Net MW, MVAR and Voltage on each 220kV Generation Tie Line
- All Units Circuit Breakers Status, Alarms and Controls
- All corresponding Relays Status and Alarms

2. Upgrade of existing RTU at Laguna Bell Substation.

Install additional points to the existing RTU to monitor the new VPP No.1 & No.2 220kV T/L's circuit breaker status / control and also MW, MVAR and AMPS on each line.

EXHIBIT D

FACILITIES STUDY SCOPE DETAILS

EXHIBIT E

MAJOR EQUIPMENT and RELAYS

**VERNON POWER PROJECT – 610MW
MAJOR EQUIPMENT AND RELAYS - CASE A**

SUBSTATIONS:

LAGUNA BELL SUB.

2	85 Ft. High x 45 Ft. Wide Line Dead-End Structures
4	220kV 3000A 50kA Circuit Breakers
8	220kV Group Operated - Horizontally Mounted Disconnect Switches
2	220kV Grounding Attachments for Line Grounding
6	220kV Voltage Transformers
2	G.E. L90 Line Current Differential Relay
2	SEL-311L Line Current Differential Relay
4	GE C60 Breaker Management Relays

REPLACEMENTS & UPGRADES OF 220kV and 66kV CIRCUIT BREAKERS:

LAGUNA BELL SUB.

MESA SUB.

Total number of elements for both locations:

2	220kV 3000A 50kA Circuit Breakers
18	220kV TRV Line to Ground Capacitors with individual steel pedestals

TRANSMISSION:

LAGUNA BELL – VPP No.1 & No.2 220kV T/L's

GOODRICH – LAGUNA BELL 220kV T/L

1	Dead End Lattice Double Circuit Structure
1	Dead End Lattice Single Circuit Structure
3	Single Circuit Tubular Steel Poles
57	Dead End Hardware / Insulators Assemblies
24000	Ft. of 1033KCMIL ACSR Conductor
3500	Ft. of ½-In Steel Overhead Ground Wire

SUB-TRANSMISSION:

3,500	Circuit Ft. of Duct Banks and 66kV U.G. Cable
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TELECOMMUNICATIONS:

7,000	Ft. of fiber optic cable
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POWER SYSTEM CONTROL:

1	Remote Terminal Unit
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**VERNON POWER PROJECT – 610MW
ADDITIONAL MAJOR EQUIPMENT FOR CASE B**

SUBSTATIONS:

REPLACEMENTS OF 220kV TERMINAL EQUIPMENT

MESA SUB.

1 220kV 3000A Wave Trap

REPLACEMENTS & UPGRADES OF 220kV CIRCUIT BREAKERS:

ETIWANDA GEN. STA.

LA FRESA SUB.

LAGUNA BELL SUB.

LUGO SUB.

MIRA LOMA SUB.

PARDEE SUB.

REDONDO GEN. STA.

VINCENT SUB.

Total number of elements for all eight locations:

36 220kV 3000A 80kA Circuit Breakers

3 220kV 3000A 63kA Circuit Breakers

108 220kV TRV Line to Ground Capacitors with individual steel pedestals

NOTE:

The materials required to upgrade the Etiwanda and Mira Loma 220kV Switchyards to 80kA Rating can not be accurately estimated at this time

E. A. ROMERO

05/21/07

EXHIBIT F
PROJECT SCHEDULE

**VERNON POWER PROJECT - 610MW
PROJECT SCHEDULE**

CASE A

ELEMENT	START	END	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16	Month 17	Month 18	
PROJECT APPROVAL	Initiate Work Orders																				
LAGUNA BELL SUB	220KV Switchyard and 69KV CB's																				
Engineering & Design	Start of Mo. 2	Start of Mo. 8																			
Major Equipment Procure & Deliver	Start of Mo. 4	Start of Mo. 12																			
Construction	Start of Mo. 11	Start of Mo. 18																			
Testing	Start of Mo. 17	End of Mo. 18																			

NOTE 1

The work at Laguna Bell Substation is the controlling element of the Project Schedule. All other Project Elements are not shown. The time required for the remaining elements would fall within the same 18-Month time frame shown for the work at the station.

NOTE 2

The Project Schedule for all upgrades required for Case B will be prepared after the Operational Study defines exactly which upgrades are required.

EXHIBIT G
COST SUMMARY

Vernon Power Project - 610MW - Elements for Case A

Cost Estimate Summary (2008 Dollars)

Scope:

Interconnect 610MW of Net Generation to the SCE Laguna Bell 220kV Bus
 The interconnection requires the reconfiguration of the Laguna Bell Sub. 220kV Switchyard to install two 220kV line Positions and two segments of new 220kV T/L's inside the station plus the relocation of one 220kV T/L rack span and the under-grounding of eight segments of 68kV Lines.
 The interconnection also requires the installation of new Telecommunication Circuits, one new RTU at the Generating Facility and the upgrade of the existing RTU at Laguna Bell Sub. and plus the replacement of two and the upgrade of four 220kV CB's at two locations.

ELEMENT	INTERCONNECTION FACILITIES		RELIABILITY UPGRADES		DISTRIBUTION SYSTEM UPGRADES		INCOME TAX COMPONENT	
	Subject to O&M	ITCC Tax	Not Subject to O&M	Subject to ITCC Tax	Subject to ITCC Tax	Subject to ITCC Tax	Income Tax Component of Contribution *	ONE TIME PAYMENT
Substations:								
Laguna Bell Sub. - Reconfigure 220kV Switchyard & Install two 220kV Line Positions	\$ 500,000		\$ 3,435,000	\$ -	\$ -	\$ 175,000	\$ -	4,110,000
Laguna Bell Sub. - Replace two 220kV CB's			\$ 1,052,000	\$ -	\$ -	\$ -	\$ -	1,052,000
Mesa Sub. - Upgrade four 220kV CB's			\$ 918,000	\$ -	\$ -	\$ -	\$ -	918,000
Transmission Lines:								
Laguna Bell - VPP No.1 & No.2 220kV T/L's - Install inside Laguna Bell Sub.	\$ 2,035,000		\$ -	\$ -	\$ -	\$ 712,000	\$ -	2,747,000
Goodrich - Laguna Bell 220kV T/L - Relocate within Laguna Bell Sub.			\$ 836,000	\$ -	\$ -	\$ -	\$ -	836,000
Sub-Transmission Lines								
Underground eight Segments inside Laguna Bell Sub.	\$ -		\$ -	\$ 4,283,000	\$ -	\$ 1,489,000	\$ -	5,782,000
Telecommunications								
I.T. Channels for Line Protection	\$ 427,000		\$ -	\$ -	\$ -	\$ 149,000	\$ -	576,000
I.T. Channels for RTU	\$ 41,000		\$ -	\$ -	\$ -	\$ 14,000	\$ -	55,000
Power System Control								
RTU at VPP Gen. Facility - New Installation	\$ 51,000		\$ -	\$ -	\$ -	\$ 18,000	\$ -	69,000
RTU at Laguna Bell Sub. - Upgrade			\$ 18,000	\$ -	\$ -	\$ -	\$ -	18,000
TOTAL	\$ 3,054,000	\$ -	\$ 6,259,000	\$ 4,283,000	\$ -	\$ 2,567,000	\$ -	\$ 16,163,000

Additional Elements for Case B

Scope:

Additional potential requirements include the replacement of thirty nine and upgrade of forty 220kV CB's at eight locations.
 NOTE: The replacement of 220kV CB's at Etiwanda and Mira Loma also require the upgrade of the 220kV Switchyards to 80kA Rating.

ELEMENT	INTERCONNECTION FACILITIES		RELIABILITY UPGRADES		DISTRIBUTION SYSTEM UPGRADES		INCOME TAX COMPONENT	
	Subject to O&M	ITCC Tax	Not Subject to O&M	Subject to ITCC Tax	Subject to ITCC Tax	Subject to ITCC Tax	Income Tax Component of Contribution *	ONE TIME PAYMENT
Substations:								
Mesa - Upgrade one 220kV Line Position			\$ 77,000	\$ -	\$ -	\$ -	\$ -	77,000
Etiwanda Gen. Sta. - Replace twenty four 220kV CB's			\$ 15,768,000	\$ -	\$ -	\$ -	\$ -	15,768,000
La Fresa Sub. - Upgrade four 220kV CB's			\$ 612,000	\$ -	\$ -	\$ -	\$ -	612,000
Laguna Bell Sub. - Upgrade fourteen 220kV CB's			\$ 1,377,000	\$ -	\$ -	\$ -	\$ -	1,377,000
Lugo Sub. - Replace three & Upgrade two 220kV CB's			\$ 2,190,000	\$ -	\$ -	\$ -	\$ -	2,190,000
Mira Loma Sub. - Replace twelve 220kV CB's			\$ 7,884,000	\$ -	\$ -	\$ -	\$ -	7,884,000
Pardee Sub. - Upgrade seven 220kV CB's			\$ 1,377,000	\$ -	\$ -	\$ -	\$ -	1,377,000
Redondo Gen. Sta. - Upgrade twelve 220kV CB's			\$ 1,224,000	\$ -	\$ -	\$ -	\$ -	1,224,000
Vincent Sub. - Upgrade one 220kV CB			\$ 306,000	\$ -	\$ -	\$ -	\$ -	306,000
Etiwanda Gen. Sta. - Upgrade 220kV Switchyard to 80kA Rating **			\$ 20,700,000	\$ -	\$ -	\$ -	\$ -	20,700,000
Mira Loma Sub. - Upgrade 220kV Switchyard to 80kA Rating **			\$ 15,525,000	\$ -	\$ -	\$ -	\$ -	15,525,000
TOTAL	\$ -	\$ -	\$ 67,040,000	\$ -	\$ -	\$ -	\$ -	\$ 67,040,000

This document includes confidential trade secrets and proprietary information of Southern California Edison, to be used only by The City of Vernon in connection with its evaluation of this Facility Study Proposal. Southern California Edison retains all rights to maintain the confidentiality of this information and requests that the City of Vernon preserve its confidentiality.

* ITCC tax (calculated at 35%) is collected via Letter of Credit.
 * Pursuant to FERC Order 2003A, there will be no ITCC collected on Reliability Upgrades.
 ** The cost of upgrading the Etiwanda and Mira Loma 220kV Switchyards to 80kA Rating is only an approximate value based on an existing estimate prepared for a similar facility.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE
STATE OF CALIFORNIA

APPLICATION FOR CERTIFICATION
FOR THE VERNON POWER PLANT PROJECT
BY THE CITY OF VERNON

DOCKET NO. 06-AFC-4
PROOF OF SERVICE LIST
(REVISED 5/1/2007)

INSTRUCTIONS: All parties shall (1) file a printed, original signed document plus 12 copies OR file one original signed document and e-mail the document to the Docket address below, **AND** (2) all parties shall also send a printed OR electronic copy of the document, plus a proof of service declaration, to each of the entities and individuals on the proof of service list:

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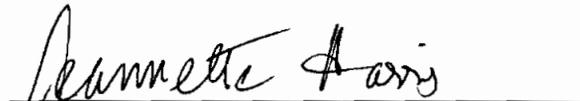
DECLARATION OF SERVICE

I, Jeannette Harris, declare that on July 19, 2007, I deposited the required copies of the attached Informal data Response, Set 1C, in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above. I declare under penalty of perjury that the foregoing is true and correct.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.



Jeannette Harris/CH2M HILL