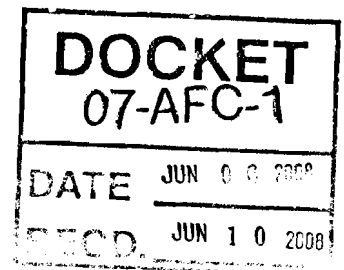

Interconnection Facilities Study Report

Generation Interconnection

Inland Energy

Victorville 2

Final



California ISO
Your Link to Power

May 6, 2008

This study has been completed in coordination with Southern California Edison per the Large Generator Interconnection Procedures.

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I. Executive Summary

Inland Energy Inc. applied to the California Independent System Operator (CAISO) for the interconnection of 563MW of generation from their Victorville 2 (VV2) Project to the CAISO Controlled Grid at the existing Southern California Edison (SCE) Victor Substation 220kV Bus. The Project's interconnection request is in accordance with FERC's Large Generator Interconnection Procedure (LGIP) Tariff

The project consists of two 154MW combustion turbines and one 269MW steam turbine with a combined auxiliary load of 14MW for a total net generation of 563MW.

The Project will be connected to the Victor Substation 220kV Bus via a new 10.4-Mile Inland Energy 220kV Generation Tie Line to be installed, owned, operated and maintained by SCE.

The first 4.4 miles of the Inland Energy 220kV Generation Tie Line will be constructed using 1590KCMIL ACSR Conductors on single circuit structures from the Generating Facility 220kV Switchyard to one of the existing Caldwell – Victor 220kV Generation Tie Line double circuit structures. The remaining 6.0 miles will be installed on the vacant side of the double circuit Caldwell – Victor 220kV Tie Line, plus six additional single circuit structures, using 1590KCMIL ACSR Conductors terminating the line at the Victor 220KV Switchyard Position 1-N.

Inland Energy requested an interconnection date of July 2009. However, at this time, based on the system upgrades required for the interconnection, the Interconnection Facilities Study (IFAS or Study) will assume an interconnection date of July 1, 2012.

This interconnection date is based on a four year time frame required to obtain permits and licensing plus engineering, design, purchase of materials and construction of the Lugo – Victor No.3 220kV T/L and the Inland Energy – Victor 220kV Generation Tie Line.

The four - year time frame will start on the date when all agreements between SCE and Inland Energy are executed and, for the purpose of this Study, this date has been estimated to be approximately July 1, 2008.

Once the LGIA has been executed by the parties and all environmental and regulatory permits are in place, the interconnection could be completed for less than four years contingent upon available resources.

An Interconnection System Impact Study (SIS) dated October 16, 2006, was prepared to address the impact of the Project to the SCE Transmission System.

The SIS was reviewed by CAISO and was granted Preliminary Interconnection Approval on October 26, 2006.

FOR ADDITIONAL DETAIL REFER TO THE FOLLOWING EXHIBITS:

- **EXHIBIT A: SIS – EXECUTIVE SUMMARY**
- **EXHIBIT B: CAISO LETTER TO SCE (ROBERT LUGO) DATED 10/26/06.**

II. System Impact Study Results

The SIS concluded that the present SCE System is not adequate to support the Project without modifications.

The Project would cause Base Case, N – 1 and N – 2 overloads on both existing Lugo – Victor No.1 and No.2 220kV T/L's and requires the installation of a new Lugo – Victor No.3 220kV T/L.

The Project would also aggravate pre-existing overloads on both existing Lugo Substation 500/220kV No.1A and No.2A Transformer Banks and would require the installation of a new 500/220kV No.3A Tr. Bk. if the earlier interconnection which triggers the initial requirement for the additional bank withdraws from the Application Queue.

The SIS and CAISO concurred that the Lugo – Victor No.3 220kV T/L and the 500/220kV No.3A Tr. Bk. at Lugo Substation must be in service before the Project comes on line.

The SIS analyzed the System assuming that the following twelve interconnections on the “North of Lugo” area plus the new Lugo – Victor No.3 220kV T/L are on line and also considered that all the related System Upgrades associated with these earlier interconnections are already in place:

Project I.D.	Area of Interconnection	MW
1. TOT 005	Victor Sub. 220kV Bus	830
2. WDAT 112	Casa Diablo Sub. 12kV Bus	17
3. TOT 100	Mountain Pass Sub. 115kV Bus	63
4. TOT 116	Control Sub. 115kV Bus	10
5. WDAT 164	Victor Sub. 115kV Bus	80
6. TOT 121	Eldorado Sub. 220kV Bus	599
7. TOT 127	Control Sub. 115kV Bus	65
8. TOT 131	Pisgah Sub. 220kV Bus	850
9. WDAT 205	Black Mountain Sub. 115kV Bus	99
10. TOT 150	Pisgah Sub. 220kV Bus	60
11. TOT 160	Victor Sub. 220kV Bus	570

NOTE: Regarding Withdrawals from the Application Queue:

On April and May 2007, the Projects TOT 121 and TOT 138 (TOT 138 is not shown above because the Point of Interconnection was outside the “North of Lugo” Area) withdrew their Applications.

SCE re-evaluated the VV2 Interconnection and concluded that such withdrawals would not have an effect on the Load Flows but would only impact the Short Circuit Duties.

For this reason, an SIS Re-Study was not required but only a re-evaluation of the Short Circuit Duties was conducted.

The SIS and the CAISO review concurred that the following System Upgrades are required:

**1. New Lugo – Victor No.3 220kV Transmission Line.
Triggered by the Project.**

The new line is required to eliminate Base Case overloads on the existing Lugo – Victor No.1 and No.2 T/L's – Rated 1240A and loaded to 1911A (154%).

2. New Lugo 500/220kV No.3 Transformer Bank.

Triggered by earlier interconnections placed ahead of the Project in the Application Queue and aggravated by the Project.

If the Higher Queued Interconnections, triggering the need for the additional Lugo Substation 1120MVA 500/220kV No.3A Tr.Bk. withdraw from the Queue, the Project would become responsible for this element.

3. Existing High Desert Power Project (HDPP) SPS expansion. Triggered by the Project.

Expand the existing High Desert SPS to include the tripping of the VV2 Project under the following single (N – 1) and double (N – 2) contingencies:

- a. Single outage of new Lugo – Victor No.3 220kV T/L
- b. Simultaneous outages of existing Lugo – Victor No.1 and new No.3 220kV T/L's
- c. Simultaneous outages of existing Lugo – Victor No.2 and new No.3 220kV T/L's

4. Existing Kramer SPS expansion.

Triggered by the Project – Only if the proposed Kramer – Lugo No.3 220kV T/L is not in place.

A new Kramer – Lugo No.3 220kV T/L is required by an earlier interconnection placed ahead of the Project in the Application Queue.

However If the Higher Queued Interconnection, triggering the need for the Kramer – Lugo No.3 220kV T/L withdraws from the Queue, the Project would become responsible for the expansion of the existing Kramer SPS to include the tripping of the VV2 Project under the double (N – 2) contingency created by the simultaneous outages of the Kramer – Lugo No.1 and No.2 220kV T/L's.

This is required because, without the Kramer – Lugo No.3 220kV T/L in service, the Project would cause post transient voltage violations and also transient instability throughout the North of Lugo System under the N – 2 condition described above.

NOTE: Regarding HDPP and Kramer SPS's Described on Items 3 and 4 above: Modification of the existing Kramer SPS is not required.

The HDPP SPS was originally designed to trip the HDPP Generation for the N – 2 outage of the Kramer – Lugo No.1 and No.2 220kV T/L's. However, after engineering and construction was completed, Transmission & Interconnection Planning concluded that tripping of the HDPP Generation for this N – 2 contingency was not required.

Consequently, all the equipment necessary to monitor the Kramer – Lugo No.1 and No.2 220kV T/L's has already been installed and is presently available for use by the HDPP SPS with only minor modifications. Therefore, the modified HDPP SPS will support all three of the N – 2 contingencies required for the VV2 project.

In addition to the overloads described above, the SIS identified the following five 500kV, sixteen 220kV, and three 115kV locations where the Project causes the Three Phase and / or the Single Phase to Ground Short Circuit Duties to go up by 0.1k A or more and requested that all circuit breakers at those locations be evaluated.

500kV:				
Eldorado	Lugo	Mira Loma	Serrano	Vincent

220kV:

Chino	Eldorado	Etiwanda	Wildlife (Jurupa)	Kramer
Lugo	Mesa	Mira Loma	Pardee	Pisgah
Rancho Vista Vista	Serrano	Sylmar	Victor	Villa Park

115kV:

Kramer	Soport	Victor
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The SIS concluded that a Facilities Study would be required to determine the scope of work and cost estimates for all elements required for Project Interconnection and System Upgrades.

III. Facilities Study Assumptions

- A. All required ISO metering equipment at the Generating Facility will be provided by Inland Energy and is not included in the Facilities Study.
- B. The following line protection relays, to be installed at the Generating Facility 220kV Switchyard termination point of the Inland Energy 220kV Generation Tie Line, will be specified by SCE and provided by Inland Energy and are not included in the Facilities Study.
 - One G.E. L90 Current Differential Relay with a dedicated digital communication channel to Victor Substation.
 - One SEL 311L Current Differential Relay with a dedicated digital communication channel to Victor Substation.
- C. The following SPS related relays, to be installed at the Generating Facility to trip generation will be specified by SCE and provided by Inland Energy and are not included in the Facilities Study.
 - Two SEL-351 Relays for generator tripping.
- D. The required RTU to be installed at the Generating Facility will be installed by SCE and it is included in the Facilities Study.
- E. Any land acquisition costs that may be required for the new Lugo – Victor No.3 220kV Transmission Line, the new Inland Energy 220kV Generation Tie Line and the Lugo Substation expansion for the additional No.3A 500/220kV Transformer Bank, are included in the Facilities Study.
- F. The costs for the preparation of the Environmental Impact Statement and the Environmental Impact Report and all other regulatory filings required for the new Lugo – Victor No.3 220kV Transmission Line and the new Inland Energy 220kV Generation Tie Line are not included in the Facilities Study.
- G. There is an existing SCE Project that will start in the year 2009 and will require substantial changes in the configuration of Victor Substation and will include modifications to the 220kV Switchyard.

This Facilities Study assumes all proposed changes to the Victor Substation 220kV Switchyard have been completed before the Project and addresses exclusively the additional changes that will be required due to the new Inland Energy Interconnection.

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:

1. Inland Energy – Victor 220kV Generation Tie Line Install approximately 4.4 Circuit Miles of new 1590KCMIL ACSR Conductors and Optical Ground Wire on new single circuit tubular steel poles and 6 Circuit Miles of 1590KCMIL ACSR Conductors on the vacant side of the existing Caldwell – Victor 220kV Generation Tie Line double circuit structures.
2. Lugo – Victor No.3 220kV T/L Install approximately 10.8 Circuit Miles of 2-1590KCMIL ACSR Conductors and Optical Ground Wire on a combination of new single and double circuit lattice structures.
This installation requires the modification of a ½-Mile segment of the existing Lugo – Pisgah No.1 220kV T/L from single circuit to double circuit construction and the temporary relocation of a 9-Mile segment of the existing Victor – Aqueduct – Phelan 115kV Line.
3. Lugo – Victor No.1 220kV T/L Relocate the Rack Span at Victor Substation from Pos. 3-S to Pos. 2-S to allow the termination of the new Lugo – Victor No.3 220kV T/L at Pos. 3-S.
4. Lugo – Victor No.2 220kV T/L Relocate the Rack Span at Victor Substation from Pos. 1-N to Pos. 1-S to allow the termination of the new Inland Energy – Victor 220kV Gen Tie Line at Pos. 1-N.
5. Victor – Aqueduct – Phelan 115kV Line Dismantle approximately nine miles of existing line and relocate temporarily on the west side of the existing Right of Way. These conductors will be re-placed on the vacant side of the Lugo – Victor No.3 220kV T/L double circuit structures after its completion.
6. Victor Substation: Install equipment as required at two existing 220kV

Positions to terminate the new Inland Energy 220kV Generation Tie Line at Pos. 1-N and the new Lugo No.3 220kV T/L at Pos. 3-S.

This work requires the relocation of the No.1 Lugo 220kV T/L from Pos. 3-S to Pos. 2-S and the No.2 Lugo 220kV T/L from Pos. 1-N to Pos. 1-S.

Also install SPS Relays.

7. Lugo Substation: Install one 220kV Line Position to terminate the new Victor No.3 220kV T/L at Pos. 7-W.
Also install SPS Relays.
Also upgrade three 50kA 500kV CB's to 63kA Rating.
8. Telecommunications Install new channels and associated terminal equipment to support the line protection relays for the new Inland Energy – Victor 220kV Generation Tie Line and the new Lugo – Victor No.3 220kV T/L, the SPS relays and the connection of the RTU to be installed at the Generating Facility.
9. Power System Control Install new RTU at the Generating Facility and expand the existing RTU's at Lugo and Victor Substations to provide status and control for the new CB's required for the Inland Energy – Victor 220kV Generation Tie Line and the Lugo – Victor No.3 220kV T/L.
10. Corporate Real Estate Perform all required functions to obtain permits and acquire land for the new Inland Energy – Victor 220kV Generation Tie Line and the new Lugo – Victor No.3 220kV T/L.

CASE B:

1. Lugo Substation Install a new 500/220kV 1120M VA No.3A Transformer Bank with associated 500kV and 220kV Bank Positions and two 220kV Bus Sectionalizing CB's.
This installation requires an extension of a relatively small section of the station to the South to provide an additional area of 400Ft. by 200Ft.
2. Antelope Substation: Replace eight 40kA 220kV CB's with 50kA Rated units and upgrade four 40kA 220kV CB's to 50kA.
3. Chino Substation: Upgrade one 50kA 220kV CB to 63kA.
4. Devers Substation: Replace seven 40kA 220kV CB's with 50kA Rated units and upgrade two 40kA 220kV CB's to 50kA.
5. Etiwanda Gen. Sta. Replace twenty four 220kV CB's of different ratings with 80kA Rated units and upgrade 220kV Switchyard to 80kA Rating.
6. Laguna Bell Substation: Upgrade fourteen 35.2kA 220kV CB's to 47.3kA.
7. Lugo Substation: Replace three 50kA 220kV CB's with 63kA Rated

- units and upgrade two 50kA 220kV CB's to 63kA.
8. Mira Loma Substation: Upgrade six 40kA 500kV CB's to 63kA.
Also replace twelve 63kA 220kV CB's with 80kA Rated units and upgrade the 220kV Switchyard to 80kA Rating.
9. Victor Substation: Replace two 20kA 115kV CB's with 40kA Rated units.
10. Corporate Real Estate Perform all required functions to obtain permits and acquire land for the expansion of Lugo Substation.

NOTE: Regarding Circuit Breaker Evaluations:

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 fifty-three 500kV CB's at five locations, two hundred and fifty-four 220kV CB's at seventeen locations and forty-one 115kV CB's at three locations.

The evaluation concluded that the Project triggers the upgrade of three 500kV CB's at Lugo Substation and contributes to pre-project requirements to replace fifty-four 220kV and two 115kV CB's and upgrade six 500kV and twenty-three 220kV CB's at nine locations.

The replacements of 220kV Circuit Breakers at the Etiwanda Gen. Station and Mira Loma Substation also require that both Switchyards be upgraded to 80kA Rating.

FOR ADDITIONAL DETAIL REFER TO THE FOLLOWING EXHIBITS:

- EXHIBIT C: VICTOR and LUGO SUBSTATIONS
- EXHIBIT D: TELECOMMUNICATIONS CHANNELS
- EXHIBIT E: FACILITIES STUDY SCOPE – DETAILS

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:	\$ 67,877,000
CASE B (<u>May</u> be added to Case A):	<u>\$140,145,000</u>
POSSIBLE MAXIMUM COST EXPOSURE:	\$208,022,000

SEE EXHIBIT F: COST SUMMARY.

V. Conclusions

- A. The estimated cost for the Interconnection is approximately \$67,877,000 for Case A with the potential additional cost of \$140,145,000 for Case B for a total Maximum Cost Exposure of \$208,022,000.
- B. The time required to complete the proposed project will be approximately two years after receiving project authorization and funding.
This time includes only the engineering, design, purchase of materials and construction of the Lugo – Victor No.3 220kV T/L and the Inland Energy - Victor 220kV Generation Tie Line.
All other elements of the project would fall within the same time frame.
This two-year time frame does not include the time required for all necessary permitting and licensing required for the installation of the new Inland Empire 220kV Generation Tie Line and the Lugo – Victor No.3 220kV Transmission Line.
A detailed Project Schedule will be provided during the Engineering and Design Phase of the Project.
- C. The costs indicated in the attached tables are shown 2012 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 150 days.
- D. 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.