

[Redacted]

WDT1079

Facilities Re-Study

December 6, 2013



SOUTHERN CALIFORNIA
EDISON

An *EDISON INTERNATIONAL*SM Company

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Added Facilities/Interconnection Facilities

[Redacted]

Southern California Edison

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I. Executive Summary

[REDACTED] applied to Southern California Edison Company (SCE) for its proposed [REDACTED] (Project) under the terms of SCE's Wholesale Distribution Access Tariff (WDAT)¹. The Project is [REDACTED] a net output of 16.5 MW to the requested Point of Interconnection (POI) at the SCE Garnet Substation 115kV² bus with an ultimate POI to the California Independent System Operator (CAISO) grid at the Devers substation 220kV bus, which is under the Devers SCE controlled sub-transmission system.

The [REDACTED] will be located in Palm Springs, California within a [REDACTED]
[REDACTED]

[REDACTED] requested commercial operation date of the project is December 31, 2014, however, based on the results of this Facilities Re-Study, SCE estimates that the installation of all the SCE facilities required to connect the project to the Garnet Substation 115kV Bus would require a minimum of 27 months after all agreements between SCE and [REDACTED] have been executed.

**FOR ADDITIONAL DETAIL REFER TO THE FOLLOWING EXHIBIT:
EXHIBIT A: POWER FLOW AND SHORT CIRCUIT DUTY REASSESSMENT – EXECUTIVE SUMMARY**

II. Power Flow and Short Circuit Duty Reassessment

SCE completed a System Impact Study and a Facilities Study in 1999, which analyzed the impacts of the proposed Small Generating Facility on SCE's electrical system, including that portion of SCE's electrical system that is part of the CAISO Grid.

Since the completion of the original studies no interconnection agreement had been executed, and changes had occurred to SCE's reliability standards, electric system topology, and area load conditions, which necessitated the need for a restudy. In June 2013 SCE conducted a reassessment to determine if such changes would materially modify the results of the studies previously performed by SCE and tendered to [REDACTED]

[REDACTED] reassessment included a Power Flow Study to identify any potential overloads as well as re-evaluation of Short Circuit Duty to identify any potential circuit breaker (CB) issues based on the latest operational queue list. The results of the reassessment were used as the basis to determine Project cost allocation for facility upgrades identified in this Facilities Re-Study. The accuracy of the Facilities Re Study results is contingent on the accuracy of the technical data provided by [REDACTED]. Any changes from the technical data provided by [REDACTED] could void these Facilities Re-Study results.

¹ [REDACTED] original application was initially processed under SCE's Transmission Owner Tariff as project TOT022, however, as a result of SCE's Devers-Mirage 115kV Split Project completed in June 2013 the facilities to which the [REDACTED] Project will interconnect are no longer under the operational control of the CAISO and are governed by SCE's WDAT.

² During this Facilities Re-study, the POI was modified from the Devers-Garnet-Indigo 115kV line to the Garnet Substation 115kV bus following a material modification review by SCE.

STUDY RESULTS

The Power Flow and Short Circuit Duty reassessment concluded that the existing SCE System is adequate to support the additional generation.

The Study conclusions are:

1. With all serial queued ahead generation projects and all corresponding facility upgrades modeled in the area, the power flow study found no overloads requiring mitigation on 115 kV or higher voltage facilities with the addition of the Project.
2. There are no new overloads created by the Project
3. There are no pre-project overloads aggravated by the Project
4. There are no circuit breakers that need to be upgraded or replaced because of the Project.

Short Circuit Duty Results:

As part of the reassessment an operation study was conducted; the Short Circuit Duty and CB evaluation did not identify the need for breaker upgrades due to the reassessment of the [REDACTED] Project. In addition, the study did not identify any new upgrades triggered by the addition of the Project or any Case B upgrades (i.e., upgrades triggered by an earlier queued project(s) that could become the responsibility of the [REDACTED] Project) that can be assigned to the Project.

Power Flow Study Results:

The Power Flow Study analysis focused on identifying system thermal overload problems within the SCE bulk system. The Power Flow Study results didn't identify any impact on the SCE system serving the sub-transmission system where the Project is proposed to interconnect. In addition, the Power Flow Study identified that the inclusion of the Project did not require the Project to participate in, or any modification to, the existing Special Protection System (SPS).

However, the [REDACTED] Project will be subject to curtailments in accordance with the CAISO Tariff and congestion management protocols to prevent overloads on the SCE bulk system. Also, due to the magnitude of the overloads anticipated on the existing West of Devers (WOD) 220 kV transmission lines and lack of emergency capability on these transmission lines, generation projects in the Devers area including the [REDACTED] Project, will be subject to significant curtailment at times, until the completion of the WOD Upgrade project, which is currently estimated to be in 2019/2020. It is important to note that construction of the WOD Upgrade project will require taking two of the existing lines out of service simultaneously for a period of time to install the new double circuit lines. Consequently, the [REDACTED] Project along with other generation projects in the Devers area may be subject to an operational procedure and/or an operational nomogram to maintain the flow on the WOD lines within the line ratings during construction.

Deliverability Assessment Results:

A deliverability assessment for this project was not performed by the CAISO as this project is an Energy only project. If [REDACTED] desires for the project to be studied for Full Capacity Deliverability Status or Partial Capacity Deliverability Status, based on available transmission capacity, [REDACTED] can apply for such deliverability pursuant to Section 4.7 "Additional Deliverability Assessment Options" of SCE's Generator Interconnection Procedures, which is Attachment I to SCE's WDAT.

III. Facilities Study Assumptions

- A. All required CAISO metering equipment at the Generating Facility will be provided by [REDACTED] and is not included in the Facilities Re-Study. The CAISO revenue meter requirements can be found in the California ISO Generator Interconnection Manual.
- B. Any required upgrades at facilities not owned by SCE are not included in the Facilities Re-Study.
- C. A Remote Terminal Unit (RTU) is needed to be installed at the generating facility to monitor generation data.
- D. [REDACTED] shall install disconnect facilities in accordance with Section 5.11 of SCE's Interconnection Handbook in order to comply with SCE's switching and tagging procedures.
- E. [REDACTED] shall construct, own, operate and maintain the 115kV [REDACTED] gen-tie line from the generating facility to a last [REDACTED]-owned structure located immediately outside the perimeter fence at the east end of SCE's Garnet Substation. [REDACTED] shall be responsible for acquiring (by fee or easement) the right of way associated with such construction, ownership, operations and maintenance of the 115kV [REDACTED] gen-tie line.

IV. Facilities Re-Study Scope and Cost Estimate

IV – A Facilities Re-Study Scope

This Facilities Re-Study will address the installation of the following elements:

- Install a new segment of [REDACTED] gen tie line between a point immediately outside the perimeter fence at the east end of Garnet substation and the switchrack (only the last segment of the line).
- Install a new line position equipped with a single circuit breaker to terminate the new [REDACTED] 115kV gen tie line.

INTERCONNECTION FACILITIES:

Garnet Substation:

Install one 115 kV line drop and one 115 kV overhead feed to [REDACTED] last structure located immediately outside the perimeter fence at the east end of the Garnet Substation.

Relay Room/Mechanical Electrical Equipment Rom (MEER):

➤ **Removal :**

- Remove three (3) IBCs and one (1)JBCG relay from Panel No. 11F for position 4 (Devers-Indigo line).
- Remove the north brick wall approximately 4 feet to create the doorway to support the MEER extension.

➤ **Installation:**

- Expand the MEER wall about 25 feet towards the north.
- Install one (1) D60 relay at existing panel no. 11F for position 4 (Devers-Indigo Line)
- Install one (1) L90 and one (1) SEL-311L relay on a new 19" rack inside the MEER extension for position 3, with two C37.94 channels between

Garnet substation and the [REDACTED] on diverse paths.

Switchrack:

➤ **Installation:**

- Install one (1) new 115 kV, 2000 AMPS, 40KA circuit breaker with associated foundation
- Install four (4) sets of 115 kV, 2000 A, three pole group operated vertical mounted disconnect switches with associated steel support structures and foundations
- Install one (1) set of 115kV, 2000A, three pole group operated with ground attachment, vertical mounting disconnect switches with associated steel support structures and foundations
- Install approximately 300 feet of 1590 KCMIL ACSR conductors for the line position.
- Install two (2) 115 kV bus support insulators for the line position
- Replace 300 feet of redwood control cable trench cover with new standard fiberglass control cable trench covers
- Extend the east 115 Bus approximately 30 feet.

Transmission:

Install two (2) light-weight steel H-frame structures. One (1) switch will be installed on the last customer-owned structure outside perimeter fence at the east end of Garnet substation. SCE will terminate on the customer-owned structure with the point of change of ownership being SCE's deadend insulator (for connection purposes, SCE will provide a pigtail with a 4-hole NEMA terminal pad.) Such customer-owned structure shall be engineered, designed and constructed to meet SCE's specifications.

The estimated line length from the SCE rack to the customer-owned and installed structure located immediately outside the perimeter fence at Garnet Substation will be approximately 300' and will require an easement of approximately 30'x130' in order to install and maintain facilities.

Telecommunication:

➤ **Installation:**

- Install lightwave and channel equipment for line protection and SCADA at Garnet substation and customer generating facility location.
- Extend Gen-Tie and diverse fiber optic cable from the customer-owned structure, located immediately outside of the perimeter fence at the east end of Garnet Substation, into Garnet Substation.
- Install approximately 150 feet (primary cable) of new underground two (2) 5" conduit to support ECS 5' L X 4'W X4'D manhole.
- Install approximately 280 feet (alternate cable) of new two (2) 5" conduit to support ECS 5' L X 4'W X4'D manhole.

Power Systems Control:

Upgrade the RTU points at the Garnet Substation RTU to monitor the 115 kV lines MW, MVAR, phase amps, 115 kV CB status/control and generation data such as 115 kV gen-tie line net MW, net MVAR, kV, CB status, units MW, MVAR, terminal voltage, auxiliary load MW, MVAR and relay protection status alarm.

- Install a one (1) new RTU at the generating facility location.

Metering Services Organization

Install revenue meters required to meter the retail load at the generating facility. The SCE retail meter will be installed in tandem with [REDACTED] CAISO meter. [REDACTED] will provide and install instrument transformers, metering cabinet for the SCE meter, and wire metering cabinet.

Corporate Environmental Health and Safety

Licensing

Real Properties

Perform all required activities related to the SCE scope of work for the [REDACTED] Project including substation, transmission and telecom elements.

FOR ADDITIONAL DETAIL REFER TO THE FOLLOWING EXHIBIT:

IV – B Facilities Study Cost Estimate

The total estimated cost of all elements associated with interconnection of the [REDACTED] Project as identified above in this Facilities RE-Study Scope is \$4,652,000.

SEE EXHIBIT B: COST SUMMARY

V. Conclusions

- A. The estimated cost to interconnect the [REDACTED] Project is approximately \$4,652,000.
- B. The time required to complete the proposed project will be approximately 27 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 the Project proceeds. The 27 month period also includes the time required for the preparation of any Environmental Impact Statement and/or Environmental Impact Report as required per CEQA and NEPA, as well as any other approvals and permits to be provided by the CPUC or other regulatory agencies. If the project can be included in [REDACTED] environmental documents, the time frame stated in this report may be reduced.
A detailed Project Schedule will be provided during the engineering and design phase of the project.
- C. The costs indicated above are shown 2013 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 Re-Study and cost estimates as presented are valid for a period of 90 days.
- D. The estimated costs will be reconciled to actual costs upon closure of the subject work orders. The necessary billing adjustments will be made at that time.
- E. Study results may be affected by changes in other projects ahead of the queue in the area. Further re-study may be required if there are changes in the project queue or the scope of projects ahead in the queue.
- F. [REDACTED] will be required to adhere to all applicable WECC policies including, but not limited to, the WECC Generating Unit Model Validation Policy. For example, [REDACTED] will be required to provide validated dynamic models for the proposed project within the timelines identified in the WECC policy. The latest policy is available on the WECC website at www.wecc.biz.

Exhibit A

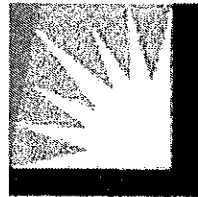
Power Flow & Short Circuit Duty Reassessment

[REDACTED]

[REDACTED]

Power Flow and Short-Circuit Duty Reassessment

June 19, 2013



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B. Power Flow Study Conclusion

The power flow study analysis focus on identifying system thermal overload problems within SCE bulk system. The power flow study results didn't identify any impact on the SCE system serving the sub-transmission system where the project is interconnected. In addition, the study identified that the inclusion of the project didn't require any modification to the existing Special Protection System (SPS).

However, the [REDACTED] project will be subject to curtailments in accordance with the CAISO Tariff and congestion management protocols resulting from overloads on the SCE bulk system. Also, due to the magnitude of the overloads on the existing West of Devers 220 kV transmission lines and lack of emergency capability on these transmission lines, generation projects in the Devers area including the [REDACTED] project, will be subject to curtailments, significant at times, until the completion of the WOD Upgrade Project, which is currently estimated to be in 2019. It is important to note that construction of the WOD Upgrade project will require taking two of the existing lines out of service for a period of time to install the new double circuit lines. Consequently, the [REDACTED] project along with other generation projects in the Devers area may be subject to an operational procedure and/or an operational nomogram to maintain the flow on the WOD lines within the line ratings during construction.

C. Deliverability Assessment

The deliverability assessment for this project was not performed as this project is an Energy only project. If [REDACTED] desires for the project to be studied for Full Capacity Deliverability Status or Partial Capacity Deliverability Status, based on available transmission capacity, [REDACTED] can apply for such deliverability pursuant to Section 4.7 "Additional Deliverability Assessment Option" of SCE's Generator Interconnection Procedures, which is Attachment I to SCE's WDAT.

D. Scope of Work for Updated Facilities Study

A Facilities Study will be required for the [REDACTED] Project. The Facilities Study (FAS) will include detailed cost estimates and schedule for the facilities required to interconnect [REDACTED] Project.

- Loop in the Devers -Indigo-Garnet 115kV line into a new [REDACTED] Substation .
- Upgrade protection on the Devers 115kV line as necessary.

I. Reassessment Study Assumptions

A. Power Flow Base Case Assumptions

All higher queued projects and any system upgrade triggered by these projects were modeled in the starting study cases. In addition, a number of transmission upgrades are needed to support generation projects in the Eastern Bulk System were modeled in order to determine if additional facilities would be needed to support the [REDACTED] project.

The following key transmission projects were included in the reassessment power flow base cases:

- Devers – Mirage Split Project
- Leatherneck 115/33 kV Substation
- Bottle 115 kV Substation
- Blast 115 kV Substation

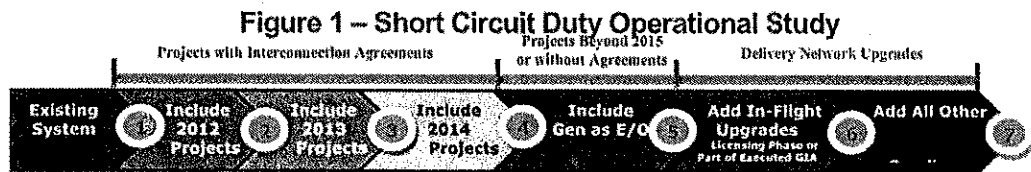
B. Short-Circuit Duty Base Case Assumptions

1. Application Queue Results

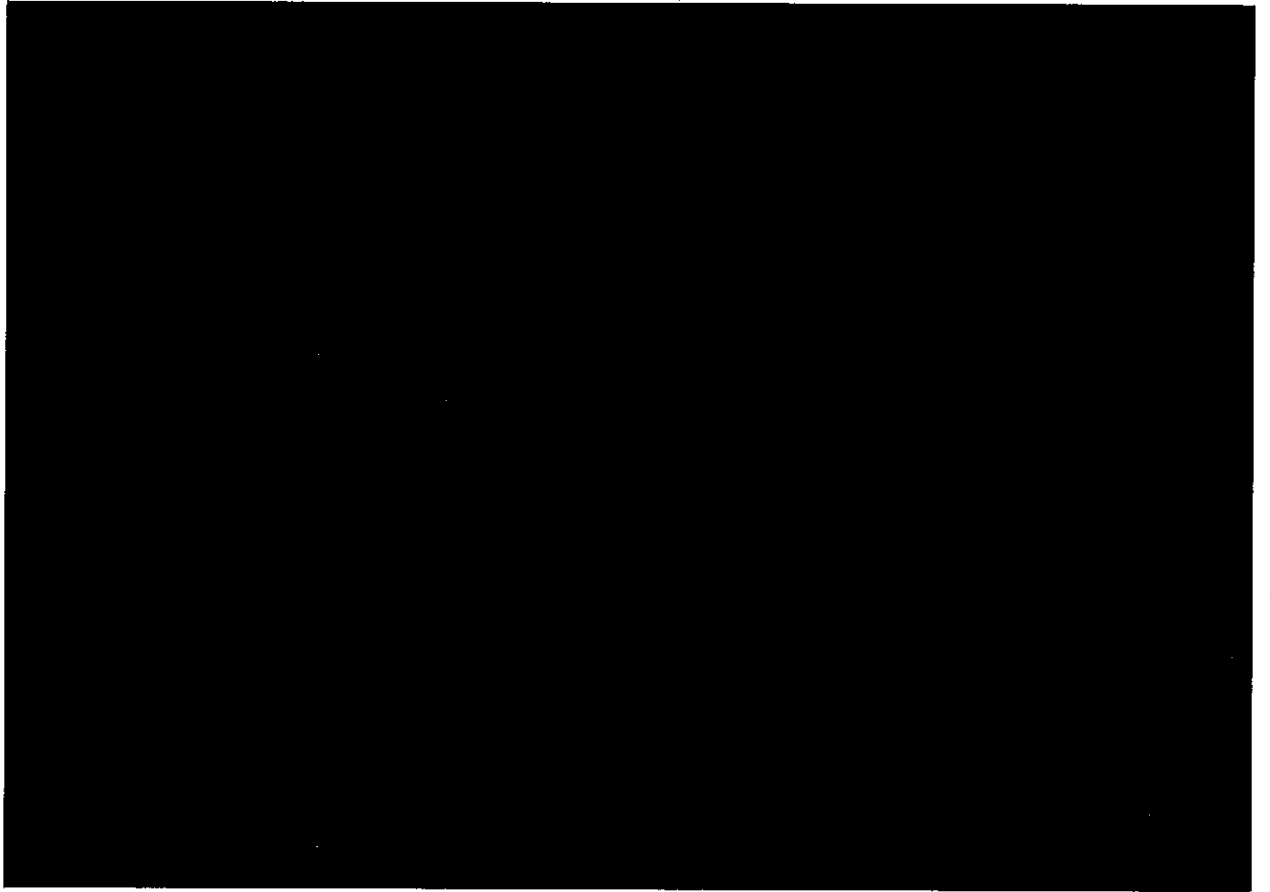
The Assessment re-evaluated the Short Circuit Duty (SCD) and Circuit Breaker (CB) performances for CAISO-Controlled facilities based on the latest application queue list. The studies did not identify any CAISO controlled circuit breakers requiring upgrade or replacement triggered by the Project. In addition, no Case B short-circuit duty mitigation has been identified to support interconnection of this project.

2. Operational Queue Study Methodology

The Operational short-circuit duty studies were performed to identify timing of need for short-circuit duty mitigations. The operational study considered seven different scenarios as shown below in Figure 1. These scenarios were selected as the most appropriate operational study conditions.



Three-phase and single-line-to-ground faults were simulated for the existing system condition to establish the starting operational base line conditions. Generation projects with an active Interconnection Agreement (LGIA, SGIA, GIA or Letter Agreement) filed at FERC were added for years 2012 and 2013 based on dates provided in the Interconnection Agreement and modified by the project execution team, if appropriate. In addition, transmission upgrades already licensed and permitted which are under construction or scheduled to be in-service by the end of 2013 were included into the 2012 and 2013 operational studies. The lists of new generation projects with executed agreements are summarized below in Table 1 and Table 2 for 2012 and 2013 respectively.



3. Operational Queue Study Results

i. Existing System with the Inclusion of Projects in 2012

The 2012 Operational Study breaker evaluation identified the need for SCD mitigation at the Antelope, Mesa, and Vincent 220 kV Substations. A summary of each location is provided below.

Antelope 220 kV

With the construction of TRTP, short-circuit duties have been increased beyond the 40 kA capability of specific circuit breakers. To mitigate the overstressed breakers, SCE has initiated a project which will replace and upgrade these specific circuit breakers in order to bring the station to a 63 kA rating. The current in-service date for completion of this mitigation is December 31, 2013.



addition, the study identified that the inclusion of the project didn't require any modification to the existing Special Protection System (SPS).

However, The [REDACTED] project will be subject to curtailments in accordance with the CAISO Tariff and congestion management protocols resulting from overloads on the SCE bulk system. Also, due to the magnitude of the overloads on the existing West of Devers 220 kV transmission lines and [REDACTED] generation projects in the Devers area including the [REDACTED] project, will be subject to curtailments, significant at times, until the completion of the WOD Upgrade Project, which is currently estimated to be in 2019. It is important to note that construction of the WOD Upgrade project will require taking two of the existing lines out of service for a period of time to install the new double circuit lines. Consequently, the [REDACTED] project along with other generation projects in the Devers area may be subject to an operational procedure and/or an operational nomogram to maintain the flow on the WOD lines within the line ratings during construction.

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- Loop in the Devers -Indigo-Garnet 115kV line into a new Wintec Substation .
- Upgrade protection on the Devers 115kV line as necessary.

Exhibit B
Cost Summary

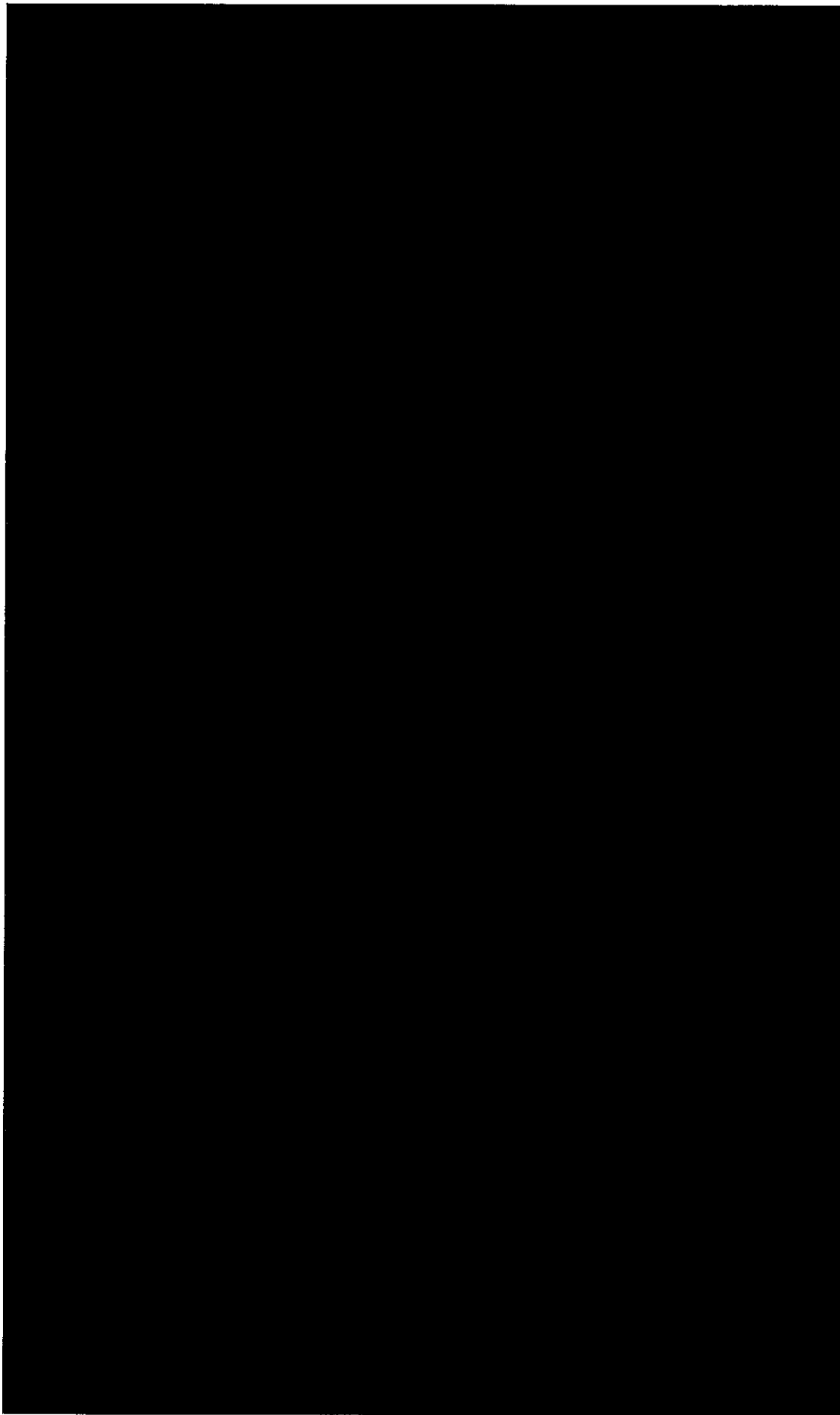


Exhibit C

Simplified One-Line Diagram of Interconnection

