-BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking on the
Commission’s Own Motion to
improve distribution level
interconnection rules and regulations
for certain classes of electric
generators and electric storage resources.

Rulemaking 11-09-011
(Filed April 7, 2021)

COMMENTS OF
THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION
ON PETITION FOR MODIFICATION

I. Introduction

The California Independent System Operator Corporation (“CAISO”) hereby
provides responses to the Administrative Law Judge’s questions issued on November 23,
2021. The CAISO fully supports the Commission’s efforts to examine the impact of
large and transmission-connected resources interconnecting under Rule 21 and
participating under net energy metering (“NEM”) tariffs.¹ These resources can have a
significant impact on reliability and the wholesale markets. As such resources
proliferate, their use of Rule 21 to interconnect and their participation under NEM tariffs
warrant the Commission’s review.

¹ The CAISO uses the term “resource” or “generator” for simplicity to refer to all supply resources,
including conventional generation, variable energy resources, energy storage resources, etc., and excluding
demand response resource or energy efficiency programs that do not export energy to the grid.
II. Responses

1. Does transmission interconnection of net energy metering systems via Rule 21 threaten the California Independent System Operator’s (CAISO’s) ability to maintain transmission grid safety and reliability? If it does, provide the details of any issues these systems raise.

As currently written, Rule 21 does not subject NEM resources to requirements sufficient for the CAISO to ensure safety and reliability without significant, unnecessary challenges. As the CAISO described in its April 23, 2021 comments, large resources participating under NEM tariffs create their own set of unique operational challenges. To participate under a NEM tariff a resource must be a net consumer over the relevant billing period, which in many cases is a full calendar year. But the CAISO has observed that many of these resources are very large solar PV arrays co-located with smaller loads. Although the customer’s demand may barely exceed its generation over the year, this is true because the demand runs all day and all night. But during the day the generation can significantly exceed onsite demand, causing the generator to export large amounts of energy every day from sunrise to sunset. Because the generator participates under a NEM tariff, the CAISO has no forecasting, telemetry, or metering regarding its operation. This means the generator itself is invisible to the CAISO even though it is using transmission capacity, affecting system frequency, changing line flows, and impacting the deliverability of other generators. Moreover, a NEM resource does not have a scheduling coordinator the CAISO can contact in the event of a potential reliability issue caused by its production. Where the CAISO could ask a wholesale resource to operate at a precise dispatch target to maintain reliability, the CAISO has almost no recourse with NEM resources. In the event of a reliability issue, the CAISO would be forced to issue dispatch instructions to nearby wholesale generation and load, or open the breaker where
the NEM resource interconnects, thereby islanding both the NEM generator and all load at that point of interconnection.

2. Does transmission interconnection of non-exporting systems via Rule 21 threaten CAISO’s ability to maintain transmission grid safety and reliability? If it does, provide the details of any issues these systems raise.

Although non-exporting resources generally would not present threats as significant as exporting resources, they can still challenge the CAISO’s ability to maintain transmission safety and reliability. The issue, however, is not whether resources interconnect via Rule 21 or via the CAISO tariff; the issue is that Rule 21 currently does not require NEM resources directly interconnected to the transmission grid to provide the CAISO any information or data once online to help maintain reliability, or any means to control the generation even in the case of reliability issues. For example, the vast majority of NEM resources are solar PV resources. Unlike CAISO participating generators, the CAISO does not receive telemetry or meteorological data from solar NEM resources. In fact, the CAISO does not know the NEM resources are there. The CAISO merely sees them as less demand in one area. But that demand reduction is entirely dependent on solar radiation. In the event of sudden cloud cover, the solar NEM resources cease to produce energy, and the demand will instantly return, affecting line flows and frequency. The CAISO mitigates this risk for CAISO participating generators by modeling their location and requiring them to provide instantaneous meteorological data and telemetry. Large CAISO resources also have specific equipment requirements to help maintain frequency in the event of a contingency. But the CAISO has no recourse with NEM resources even when they are large and directly connected to the

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2 See Section 9.6.4 of Appendix EE to the CAISO tariff.
CAISO controlled grid. The CAISO can only call on nearby participating generators or
load to maintain frequency or otherwise mitigate a reliability event caused or exacerbated
by the presence of NEM resources.

3. For what specific operational purpose does CAISO use four-second telemetry
data? Why is a less temporally granular telemetry data stream (e.g., 15-minute
granularity) not sufficient for maintaining transmission grid safety and
reliability?

To maintain reliability, the CAISO must balance electric demand and supply at all
times.\(^3\) Hence the term “balancing authority.” If unbalanced, the frequency of the grid
will deviate from the 60 Hz all electric equipment is designed to work on.\(^4\) If the
frequency deviates too far from 60 Hz, generators, substation equipment, and load
resources will protect themselves by islanding from the grid, generally by opening circuit
breakers. This is how large, lasting blackouts occur: too many resources physically trip
in response to frequency disturbances, and it takes significant time and effort to
resynchronize them to the grid safely and reliably.

The CAISO measures system frequency from multiple locations across the
balancing authority area. When frequency deviates from 60 Hz, the CAISO relies on
instantaneous telemetry to determine which resources have diverged from their dispatch
schedules, thereby causing the deviation. In the event of a contingency, the CAISO also
relies on instantaneous telemetry to determine which resources are still electrically
connected or disconnected, and which resources can provide ancillary services to mitigate
the contingency. Without instantaneous telemetry, the CAISO does not have situational

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\(^3\) Hence the term “balancing authority.” The CAISO also must ensure all thermal line ratings are
observed and adhere to a large host of other reliability standards.

\(^4\) In North America, at least.
awareness of the resources causing, mitigating, or exacerbating reliability events. This situation could be exacerbated by a rapid growth of transmission-connected NEM resources.

4. Provide examples of how interconnection costs and timelines differ for a given system (or set of systems) interconnecting to transmission via the CAISO Open Access tariff versus net energy metering systems interconnecting via Rule 21. Provide illustrative examples of as many systems as possible and be as descriptive (system size, generation type, location in California, sector (e.g., agricultural, industrial, fuel production, etc.) and as specific as possible (a spreadsheet containing these descriptions, cost comparisons, and timelines may be an appropriate way to convey this information).

The CAISO has three options for new resources to interconnect to the CAISO controlled grid (1) the cluster study, (2) the independent study, and (3) the fast track process. The basic requirements for these options are set forth here:

<table>
<thead>
<tr>
<th>Length</th>
<th>Cluster Study</th>
<th>Independent Study</th>
<th>Fast Track</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Cost</td>
<td>~ 2 years</td>
<td>~ 6 months</td>
<td>~ 6 weeks</td>
</tr>
<tr>
<td>Other Initial Requirements</td>
<td>$150,000 deposit</td>
<td>$150,000 deposit</td>
<td>$500 fee</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td>Must demonstrate need and ability to interconnect more quickly than the cluster study process. Must interconnect in an area the CAISO can study independently from other interconnection customers.</td>
<td>Generator must be 5 MW or less.</td>
</tr>
</tbody>
</table>

The CAISO has a detailed overview of these studies available on its website. It has attached this overview as Exhibit A to these responses.

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5 Independent study interconnection customers must demonstrate a need and ability to interconnect more quickly than the cluster study process, and they must interconnect in an area the CAISO can study independently from other interconnection customers.
6 Fast track interconnection customers cannot exceed 5 MW.
Respectfully submitted,

By: /s/ William H. Weaver
Roger E. Collanton
   General Counsel
William H. Weaver
   Senior Counsel
California Independent System Operator Corporation
250 Outcropping Way
Folsom, CA 95630
T – 916-608-1225
F – 916-608-7222
bweaver@caiso.com

Dated: December 21, 2021
EXHIBIT A
Interconnection Application Options and Process

Jason Foster, Sr. Interconnection Specialist
Phelim Tavares, Sr. Interconnection Specialist
Matt Chambers, Sr. Interconnection Specialist
Linda Wright, Sr. Interconnection Specialist
Julie Balch, Sr. Interconnection Specialist

March 11, 2020
Topics

- Interconnection Resource Team
- ISO Tariff and Business Practice Manuals (BPM)
- Application Options, Requirements, and Timelines
- Generator Downsizing Process
- Project Withdrawals
- Electronic Submission of Interconnection Requests (RIMS)
Interconnection Overview

Jason Foster, Sr. Interconnection Specialist
Interconnection Resources – We’re here to support you!

- Interconnection Customer’s point of contact throughout application and study process
- Facilitates communications between all parties
- Conducts project scoping and study results meetings
- Ensures documentation and project information is up to date in the Resource Interconnection Management System
- General questions, IRInfo@caiso.com
California ISO Tariff

The California ISO operates under the terms and conditions of its FERC-approved tariff:

- Section 25 addresses interconnection of generating units

In addition, appendices of the tariff address generator interconnection processes:

- **Appendix DD**
  - Generator Interconnection Deliverability Allocation Procedures (commonly known as the GIDAP).

- **Appendix EE**
  - Large Generator Interconnection Agreement for interconnection requests processed under Tariff Appendix DD.

- **Appendix FF**
  - Small Generator Interconnection Agreement for interconnection requests processed under Tariff Appendix DD.
California ISO Tariff-cont.

- The CAISO tariff may be modified, amended, or supplemented as needed, subject to the approval of FERC.
- Each section or appendix of the CAISO tariff is maintained and updated separately in accordance with FERC orders.
- The CAISO tariff governs in case of any inconsistency or ambiguity with, business practice manuals, operating procedures, or interconnection agreements.
Business Practice Manuals

ISO Business Practice Manuals (BPMs) provide detailed guidelines, procedures, and examples.

Interconnection Resources Team References Three BPMs

• BPM for Generator Interconnection Deliverability Allocation Procedures (GIDAP)
  – Current, effective with Cluster 5 and forward

• BPM for Generator Interconnection Procedures (GIP)
  – Applicable only to existing Cluster 4 and earlier projects

• BPM for Distributed Generation for Deliverability (DGD)
Interconnection Process Map

You are here

Transmission-level resource interconnection (using ISO procedures)
ISO interconnection request
ISO interconnection study
ISO interconnection agreement
ISO new resource implementation
Sync date
Trial operations
COD date

Distribution-level resource interconnection (using utility procedures)
Utility interconnection request
Utility interconnection study
Utility interconnection agreement

In parallel (outside of ISO/utility procedures)
Permitting, engineering, procurement, construction
Application Options

- **Pre-Application**
  - Small project; 20 MW or less

- **Cluster study**
  - Small project; 20 MW or less
  - Large project; more than 20 MW

- **Independent Study Process**
  - When the cluster process does not accommodate desired COD
  - Must be electrically independent

- **Fast Track Process**
  - 5 MW or less
Pre-Applications

- Opportunity for Interconnection Customers with a proposed Small Generating Facility to receive a report of readily available data

- Requirements
  - $300 Non-Refundable Fee
  - Pre-Application Request Form

- Report includes (as applicable):
  - Electrical configuration of the substation
  - Existing aggregate generation capacity for substation or circuit
  - Existing or known constraints for a proposed Point of Interconnection (POI)
  - Available capacity on substation or circuit likely to serve the proposed POI
## Application Options Summary

<table>
<thead>
<tr>
<th>Study Process</th>
<th>Application Window</th>
<th>Site Exclusivity (SE)</th>
<th>Study Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster</td>
<td>April 1-15</td>
<td>Deposit or Documents</td>
<td>$150k</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$&lt;20 MW = $100K</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$&gt;20 MW = $250K</td>
<td></td>
</tr>
<tr>
<td>Independent Study Process (ISP)</td>
<td>Anytime</td>
<td>SE Must be demonstrated</td>
<td>$150k</td>
</tr>
<tr>
<td>Fast Track (FT)</td>
<td>Anytime</td>
<td>SE Must be demonstrated</td>
<td>$500 processing fee</td>
</tr>
</tbody>
</table>
### Interconnection Timeline Summary

**Cluster 13 – Two+ years**

<table>
<thead>
<tr>
<th>Cluster 13 Application</th>
<th>Scoping Meeting</th>
<th>Phase I Study</th>
<th>Phase I Meeting</th>
<th>1st Posting</th>
<th>Phase II Study</th>
<th>Phase II Meeting</th>
<th>Transmission Plan Deliverability</th>
<th>2nd Posting</th>
<th>Reassessment Result</th>
</tr>
</thead>
</table>

**Independent Study Process (ISP) – Eight months without deliverability**

<table>
<thead>
<tr>
<th>ISP Application</th>
<th>Electrical Independence</th>
<th>Scoping Meeting</th>
<th>Systems Impact and Facilities Study</th>
<th>Results Meeting</th>
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<th>Reassessment Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anytime</td>
<td>30 CD from ISP eligibility</td>
<td>Set date within 5 BD of Electrical Independence</td>
<td>&lt;= 120 CD of Study Agreement</td>
<td>&lt;= 20 BD of Study Results</td>
<td>&lt;= 120 CD of Study Results</td>
<td>Aug Annually</td>
</tr>
</tbody>
</table>

**Fast Track (FT) – 10 weeks or more**

<table>
<thead>
<tr>
<th>FT Application</th>
<th>Initial Review (Screens)</th>
<th>Customer Options Meeting</th>
<th>Supplemental Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anytime</td>
<td>15 BD from FT Eligibility</td>
<td>10 BD from Determination of Upgrades / Additional Studies Needed</td>
<td>10 BD from Receipt of Review Deposit</td>
</tr>
</tbody>
</table>
Site Exclusivity

• Requirement for interconnection service
  – Initially, interconnection customers may provide a deposit
    – $100k/small and $250k/large

• For private land, Site Exclusivity is:
  – (a) Ownership of, a leasehold interest in, or a right to develop property upon which the Generating Facility will be located consisting of a minimum of 50% of the acreage reasonably necessary to accommodate the Generating Facility; or
  – (b) an option to purchase or acquire a leasehold interest in property upon which the Generating Facility will be located consisting of a minimum of 50% of the acreage reasonably necessary to accommodate the Generating Facility.

• For public land, please consult Appendix A of the CAISO tariff (“Site Exclusivity”) and 5.1.3 of the BPM for GIDAP
Site Exclusivity-cont.

- Common problems with documentation:
  - The demonstration of Site Exclusivity, at a minimum, must be through the Commercial Operation Date
    - Most commonly an issue for leases or options to lease
  - The name of the interconnection customer and the name of the lease/option/grant holder do not match
    - Must provide an assignment agreement, certified organizational chart, or other documentation to evince that the interconnection customer (as listed on the interconnection request) holds the property interest
  - The rights to the land must include the right to develop the proposed project.
    - Not just the right to occupy for the purposes of environmental or other assessments.
Project Naming Requirement

NERC COM-002 Requirement

Stricter requirements for project name selection

- Duplicated or Unacceptable Project Names will:
  - Cause issues on the Operations Floor
  - Not be accepted into RIMS
  - Require changes after the IR submission

- Valid and acceptable project names will:
  - Provide clear and concise communications
  - Provide smoother transition for each stage of the study/project
  - Result in less required project name changes

Tools

- Section 5.2 of GIDAP BPM, Selecting a Project Name
- Prohibited Project Name List (link)
Cluster Study, Application Process

- Application Window open April 1\textsuperscript{st} – April 15\textsuperscript{th}
  - FERC Approval in March 2018

- Complete Interconnection Request Package
  - Submit IR more than 5 BDs early for opportunity to cure incomplete package
  - ISO has 5 BDs to deem IR Package Complete
    - Day-for-day extension for ISO delays
  - All IR Package elements must be received by April 15. Packages not deemed complete WILL NOT be studied in Cluster 13.
  - Funds preferred via Fed Wire; checks are accepted
Cluster Study, Application Process

**Complete Interconnection Request Package must include:**

(i) An Interconnection Study Deposit of $150,000

(ii) A completed application in the form of Appendix 1, Word doc
    a. Including Attachment A, Excel doc
    b. Study agreement, authorized signatory, & state of incorporation for IC

(iii) Demonstration of Site Exclusivity or posting of a SE Deposit

(iv) A load flow model

(v) A dynamic data file

(vi) A reactive power capability document

(vii) A site drawing

(viii) A single-line diagram

(ix) A flat run plot and a bump test plot from the positive sequence transient stability simulation application

(x) A plot showing the requested MW at the Point of Interconnection from the positive sequence load flow application
Cluster Study, Application Process

• Validation & Deficiencies Cure of Interconnection Request (IR)
  – ISO has 10 business days to determine IR validity (initial review)
  – ISO has 5 BDs to respond IR validity (subsequent Reviews)
    • Day-for-day extension for ISO delays until May 31
  – ICs do not have response timeline requirements

• June 30th cut-off to cure all deficiencies
  – Plus any extensions due to ISO delay
  – Cure deficiencies in required timeframe to be included in cluster study

• Once all applications are validated:
  – Queue numbers assigned
  – Queue report is available in RIMS
Questions?
Cluster, Independent Study, and Fast Track Process Overview

Phelim Tavares, Sr. Interconnection Specialist
Cluster Study Process

- Interconnection Requests (IR) submitted April 1st – April 15th each year are studied together
- Study costs shared between projects assigned to same study group
- Two cost components:
  - Network Upgrade costs assigned to projects on pro rata basis, if shared
  - Interconnection Facilities costs are project specific, not shared
### Cluster - Customer Meetings & Studies

<table>
<thead>
<tr>
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<th>Phase I Study</th>
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</tr>
</thead>
</table>

- Approximately 2 years for above timeline with deliverability

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Scoping Meeting</th>
<th>Phase I Study *</th>
<th>Phase I Results Meeting *</th>
<th>Phase II Study *</th>
<th>Phase II Results Meeting *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In-Service / COD P.O.I. Transmission system</td>
<td>NU &amp; IF Costs &amp; Timeline Study Report</td>
<td>Study Results Cost Responsibility for Upgrades</td>
<td>Updated NU &amp; IF Costs &amp; Timeline Study Report</td>
<td>Updated Study Results Cost Responsibility for upgrades</td>
</tr>
<tr>
<td>Timing</td>
<td>No later than June 30</td>
<td>Begins July 1 170 CD to Complete</td>
<td>Within 30 CD of Phase I Study Report</td>
<td>Begins May 1 205 CD to Complete</td>
<td>Within 30 CD of Phase II Study Report</td>
</tr>
</tbody>
</table>

*Planned dates shown. Also applicable to ISP projects with deliverability studied with the cluster.*
Cluster – IC Cost Responsibility

- Generally, IC’s maximum set by lower of Phase I and Phase II Network Upgrades (NU) costs
- No maximum for Interconnection Facilities (IF) costs
- May be impacted by:
  - Appendix B allowed changes
    - Reduced MWs
    - Deliverability decisions
  - Reassessment study impacts
- Updated cost responsibility definitions will be covered in the second presentation that covers the study results
Cluster - Modifications Between Phase I and II

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- Appendix B (to GISPA study agreement) due 10 business days after Phase I results meeting:
  - Confirms deliverability status & option A/B, project milestone dates, and other data provided in the IR
  - Identifies allowable modifications:
    - Decrease in MW output
    - Modify technical parameters of technology
    - Modify the interconnection configuration
    - Point of Interconnection (POI) Change
Cluster - Interconnection Financial Security

- Posted to PTO as security for project costs
  - Network Upgrades
  - Interconnection Facilities

- Posting formulas
  - Initial – 15% of upgrades with qualifiers
  - Second – 30% of upgrades with qualifiers
  - Qualifiers include:
    - project size (initial posting only)
    - Minimums
    - Maximums
### Cluster - Interconnection Financial Security

<table>
<thead>
<tr>
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<th>Phase II Study</th>
<th>Phase II Meeting</th>
<th>Transmission Plan Deliverability</th>
<th>2nd Poster</th>
<th>Reassessment Result</th>
</tr>
</thead>
</table>

**Initial**
- Phase I study report
  - 90 CD

**Second**
- Phase II study report
  - 180 CD

**Third**
- No later than start of construction
- May be milestone based

![Helmet icon]
Independent Study Process Application

- Can submit an Interconnection Request anytime, however it is advantageous to submit the applications anytime between November and March
- Eligibility:
  - Demonstrate cluster process cannot accommodate desired Commercial Operation Date, and provide evidence of the following:
    - Financial resources
    - Permitting and regulatory approval
    - Purchase order for gen equipment
    - Point of Interconnection
    - Reliability Network Upgrades
  - Site Exclusivity via documentation only
  - Electrical Independence
  - Deliverability Assessment included as part of next Cluster study
# Independent Study Process - Customer Meetings & Studies

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<td>&lt;= 120 CD of Study Results</td>
<td>Aug Annually</td>
</tr>
</tbody>
</table>

- Approximately 8 months for above timeline through Results Meeting

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Scoping Meeting</th>
<th>System Impact and Facilities Study</th>
<th>Results Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility Loadings</td>
<td></td>
<td>Short Circuit, Stability, &amp; Power Flow Analysis</td>
<td>Study Results</td>
</tr>
<tr>
<td>Instability, Short Circuit, Voltage, &amp; Reliability Issues</td>
<td></td>
<td>IF &amp; RNU Costs and Timeline</td>
<td>Cost Responsibility for Upgrades</td>
</tr>
<tr>
<td>Prior System Studies</td>
<td></td>
<td>Study Report</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Needed Studies</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timing (Deliverability not included)</th>
<th>Scoping Meeting</th>
<th>System Impact and Facilities Study</th>
<th>Results Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled within 5 BD of Notification of Electrical Independence</td>
<td>Completed within 120 CD after Execution of Study Agreement</td>
<td>20 BD after System Impact and Facilities Study Report Provided to IC</td>
<td></td>
</tr>
</tbody>
</table>
Independent Study Process-Interconnection Financial Security

ISP (non-deliverability portion)

System impact & facility study report

120 CD

Initial

Second/Final (100%)
- No later than start of construction
- May be milestone based

Deliverability Studies follow the Cluster Timeline
Independent Study Process- Interconnection Financial Security

• Posted to PTO as security for assigned project costs

• Network Upgrades and Interconnection Facilities costs
  – No ADNUs
  – Large (>20 MW) vs. small (<= 20 MW) formulas

• Cost Responsibility is established in the System Impact and Facilities study for Energy Only

• Deliverability portion is set forth in Phase I and Phase II study
Fast Track Study Process Application

- No larger than 5 MW with Energy Only status
- Submit Interconnection Request at any time
  - $500 non-refundable processing fee
- Eligibility
  - Site Exclusivity via documentation only
  - Must pass all screens
- Customer Meetings, if required
  - Customer Options
  - Supplemental Review
### Fast Track Timelines and Meetings

<table>
<thead>
<tr>
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<th>Initial Review (Screens)</th>
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</tr>
</tbody>
</table>

- Approximately 10 weeks or more for above timeline

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Customer Options Meeting (if needed)</th>
<th>Supplemental Review (if needed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If IR cannot be approved with minimal costs, or a supplemental study, or other additional studies</td>
<td>Determines whether the facility can continue to qualify for interconnection under the FT process</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scheduled within 10 BD of determination that IR cannot be approved without modifications at minimal cost.</td>
</tr>
<tr>
<td></td>
<td>IC will agree to a review within 15 BD of the offer.</td>
</tr>
</tbody>
</table>
Fast Track-Cost Responsibility

• Financial Security is usually not required unless costs are identified in the supplemental review.

• Costs identified in the Customer Options Meeting or Supplemental Review.
  – Facility modifications
  – Modifications to the Participating TO’s electric system
Questions?
Transmission Plan Deliverability Allocation and Other Study Processes

Matt Chambers, Sr. Interconnection Specialist
Resource Adequacy & Deliverability

• Resource Adequacy (RA) is a CPUC program designed to:
  – Provide sufficient resources to the ISO to ensure safe and reliable operation of the grid in real time
  – Incentivize appropriate siting and construction of new resources to meet future reliability needs

• Deliverability is a resource attribute designated by ISO
  – Required for participation in the RA Program
  – Not to be confused with firm transmission service
  – Deliverability status does not guarantee that a project will avoid curtailment due to transmission congestion
Deliverability Statuses

• Full Capacity Deliverability Status (FCDS)
  – Allows a resource to provide RA Capacity to meet a Load Serving Entity’s RA requirement
  – Net Qualifying Capacity payments settled bilaterally

• Energy Only Deliverability Status
  – Not eligible to provide RA Capacity

• Partial Capacity Deliverability Status
  – Only a fraction of generating facility capacity is Deliverable

Note:
• Operationally, no difference between Deliverability statuses
• The dispatch of energy is based on economics; not Deliverability Status
TP Deliverability Allocation Process: Affidavits

<table>
<thead>
<tr>
<th>Cluster 13 Application</th>
<th>Scoping Meeting</th>
<th>Phase I Study</th>
<th>Phase I Meeting</th>
<th>1st Posting</th>
<th>Phase II Study</th>
<th>Phase II Meeting</th>
<th>Transmission Plan Deliverability</th>
<th>2nd Posting</th>
<th>Reassessment Result</th>
</tr>
</thead>
</table>

- Projects requesting FCDS must submit affidavit to be eligible for Deliverability allocation. Applies to:
  - Cluster, ISP, and PTO WDAT studied by ISO for Deliverability in current cluster
  - Parked projects
  - Energy Only projects seeking Deliverability from existing and approved transmission facilities

- Market Notice will specify due date (typically due early December)

- Projects must, at a minimum, select an allocation group and attest to current financing, permitting and land acquisition statuses

- Allocation groups will establish priority if insufficient Deliverability
### TP Deliverability Allocation Group Descriptions

<table>
<thead>
<tr>
<th>Allocation Group</th>
<th>Deliverability Status</th>
<th>Commercial Status (PPA or shortlisting must require Deliverability)</th>
<th>Can Build DNU's for Allocation?</th>
<th>Allocation Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Current Cluster Phase 2 Study / Parked</td>
<td>(i) Executed or reg-approved PPA; OR (ii) LSE serving its own load</td>
<td>Yes</td>
<td>Allocated 1st</td>
</tr>
<tr>
<td>2</td>
<td>Current Cluster Phase 2 Study / Parked</td>
<td>(i) Shortlisted in a RFO/RFP; OR (ii) Negotiating a PPA</td>
<td>Yes</td>
<td>Allocated 2nd</td>
</tr>
<tr>
<td>3</td>
<td>Current Cluster Phase 2 Study</td>
<td>Proceeding without a PPA</td>
<td>Yes</td>
<td>Allocated 3rd</td>
</tr>
</tbody>
</table>

- **Group 1:** Must provide copy of executed PPA
- **Group 2:** Confirmation of shortlisting and terms on RFO/RFP required; or Terms of PPA and counterparty confirmation required
- **Group 3:** Projects proceeding to construction even if unable to secure PPA
  - Must accept allocation or WITHDRAW
  - Project will be converted Energy-Only if unable to comply with strict rules designed to limit time in Queue
TP Deliverability Allocation Group Descriptions

<table>
<thead>
<tr>
<th>Allocation Group</th>
<th>Deliverability Status</th>
<th>Commercial Status</th>
<th>Can Build DNUs for Allocation?</th>
<th>Allocation Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (i) 4 (ii)</td>
<td>Converted to Energy-Only; OR Energy-Only projects that achieved Commercial Operation Date</td>
<td>Executed or regulator-approved PPA requiring FCDS</td>
<td>No</td>
<td>Allocated 4th</td>
</tr>
<tr>
<td>5 (i) 5 (ii)</td>
<td>Converted to Energy-Only; OR Energy-Only projects that achieved Commercial Operation Date</td>
<td>Shortlisted in a RFO/RFP or Negotiating a PPA</td>
<td>No</td>
<td>Allocated 5th</td>
</tr>
<tr>
<td>6</td>
<td>Converted to Energy-Only</td>
<td>Commercial Operation Date achieved</td>
<td>No</td>
<td>Allocated 6th</td>
</tr>
<tr>
<td>7</td>
<td>Energy-Only</td>
<td>Commercial Operation Date achieved</td>
<td>No</td>
<td>Allocated 7th</td>
</tr>
</tbody>
</table>

- Must submit a seeking TP Deliverability affidavit and $60,000 study deposit as described in Market Notice
TP Deliverability Allocation Results

<table>
<thead>
<tr>
<th>Cluster 13 Application</th>
<th>Scoping Meeting</th>
<th>Phase I Study</th>
<th>Phase I Meeting</th>
<th>1st Posting</th>
<th>Phase II Study</th>
<th>Phase II Meeting</th>
<th>Transmission Plan Deliverability</th>
<th>2nd Posting</th>
<th>Reassessment Result</th>
</tr>
</thead>
</table>

- Transmission Plan (TP) Deliverability allocation:
  - Determined from most recent Transmission Plan and eligible projects seeking Deliverability
  - Projects may be allocated 0% - 100% of requested amount
  - Deliverability allocation results released to all eligible projects requesting FCDS in mid-March
  - Within seven calendar days of results notice, IC must confirm how to proceed via customer options form (accept allocation, decline, park, etc.)
Distributed Generation (DG) Seeking Deliverability

- Annual Process
  - February - July

- Must apply to Utility Distribution Company (UDC)

- Eligibility
  - Wholesale Distribution Access Tariff or CPUC Rule 21

- Business Practice Manual on Distributed Generation for Deliverability
Annual Downsizing Opportunity

- Reduce existing project MW size for projects in the CAISO queue
  - Apply annually, Oct 15 – Nov 15
  - Separate downsizing request application
  - $60K study deposit
  - Meet the eligibility requirements:
    - Project must be in good standing
  - Included in the annual reassessment and downsizing results study
Reassessments

• Annual downsizing and reassessment study report:
  – Shows the impacts of downsized projects, results of TP Deliverability, and withdrawals in the CAISO queue
  – Any active project that has complete the Phase II study and is impacted and/or submitted a request through the Annual Downsizing will receive this report
  – Issued around late July each year
Questions?
Withdrawals, Refunds, and Recovery

Julie Balch, Interconnection Specialist
Withdrawals, Refunds, and Recovery

IC may withdraw at any time.

ISO may withdraw an IR if the IC fails to adhere to certain requirements of the Tariff
Withdrawals, Refunds, and Recovery (Cont.)

Effects on study deposit

Scoping Meeting for Cluster and ISP projects

Phase I for Cluster System Impact and Facilities Study for ISP Results Meeting

100% of Unused Portion

30 CD

Difference between study deposit and greater of costs incurred or one-half of study deposit to a max of $75K

30 CD

No Refund
Withdrawals, Refunds and Recovery (Cont.)

Financial Security for **Interconnection Facilities**

- Release of entire posted amount, except any amounts necessary to pay for costs incurred or irrevocably committed.
Withdrawals Refunds and Recovery (Cont.)

Financial Security for Network Upgrades for Cluster and ISP projects

- On 2/19/19 FERC approved CAISO’s proposed removal of all conditions for partial IFS recovery
- All projects qualify for recovery of 50% of IFS postings for NUs upon withdrawal
  - Less any irrevocably committed funds by PTO towards any NUs
Withdrawals Refunds and Recovery (Cont.)

Initial Posting  Second Posting  Construction

Formula for non-refundable portion: Lesser of IFS (plus any other provided security plus any separately provided capital):

less all costs and expenses incurred or irrevocably committed,

OR

minus the lesser of 50% of posted value or $10K/MW ($20K/MW after second posting)
Withdrawals Refunds and Recovery (Cont.)

Withdrawal between the initial posting and the deadline for the second posting for a cluster project

Example 1:
Project size: 100 MW
Interconnection Financial Security (IFS) posted for Network Upgrades (NUs): $20M

50% of posted amount or $10K/MW, whichever is less is calculated:
50% of $20M = $10M
$10K x 100 MW = $1M

The lesser amount, $1,000,000 is deducted from the posted security.
$20M (deposit)
- 1M ($10K/MW)
$19M Recovered by IC
Withdrawals Refunds and Recovery (Cont.)

Withdrawal between the initial posting and the deadline for the second posting for a cluster project

Example 2:
1,250 MW project
IFS posted for NUs: $20M
50% of posted amount or $10K/MW, whichever is less is calculated:
50% of $20M = $10M
$10K x 1,250 MW = $12.5M

The lesser amount, $10M is deducted from the posted security.
$20M (deposit)
- 10M (50%)
$10M Recovered by IC
Withdrawals Refunds and Recovery (Cont.)

Withdrawal between the second posting and the commencement of construction activities for a cluster project

Example 1:
Project size: 100 MW
IFS posted for NUs: $20M

50% of posted amount or $20K/MW, whichever is less is calculated:
50% of $20M = $10M
$20K x 100 MW = $2M

The lesser amount, $2M is deducted from the posted security.
$20M (deposit)
- 2M ($20K/MW)
$18M Recovered by IC
Withdrawals Refunds and Recovery (Cont.)

Withdrawal between the second posting and the commencement of construction activities for a cluster project

**Example 2:**
Project size: 1,000 MW
IFS posted for NUs: $20M

50% of posted amount or $20K/MW, whichever is less is calculated:
50% of $20M = $10M
$20K x 1K MW = $20M

The lesser amount, $10M is deducted from the posted security.
$20M (deposit)
- 10M (50%)
$10M Recovered by IC
Questions?
RIMS App & Study Module

Linda Wright, Sr. Interconnection Specialist
Electronic Interconnection Request Submission

- Resource Interconnection Management System (RIMS) is a secure web-based database application

- Electronic submission of Interconnection Requests accomplished via a user interface from the CAISO website

- RIMS5 User Guide is available on-line

- Access to RIMS is established by the CAISO’s Access and Identity Management (AIM) system
Resource Interconnection Management System (RIMS) is the CAISO's system for tracking several different interconnection processes at the CAISO. A training presentation for RIMS is available [here](https://rimspub.caiso.com/rims5/logon.do).

### Queue Viewing Instructions
1. Click on “Reporting” tab in top left corner of this screen.
2. Once you are on the report dashboard, use scroll bar on bottom to view information on the right side of the report screen.
3. Use Action Toolbar icons at top left of report dashboard to customize the view. Expand the following section to view the details.
   - **Action Toolbar**
4. Export the report to Excel to further evaluate data.

### App & Study Module (Interconnection Request)
CAISO Queue Interconnection Requests are tracked in the App & Study Module. Click [here](https://rimspub.caiso.com/rims5/logon.do) for process guidance and forms. Please select the "Interconnection Request" request type at the left to submit this type of project.

1. Fill in the "New Request" section above to receive a registration code via email that will allow you to upload an Interconnection Requestor Project Details Form and associated documents. This only needs to be done once for each project to be submitted.
2. Once a registration code is received, paste it into "Registration Code" field to upload required project files.
Electronic Interconnection Request Submission (cont’d)

New Request

First Name: Linda
Last Name: Wright
Email: lwright@caiso.com
Confirm Email: lwright@caiso.com
Requested Project Name: New Project Name
Request Type: Interconnection Request

Register

Retrieve Request

Registration Code: 

Submit
Here are the details of your project registration

Project Name : New Project Name
Registration Code : 16AS207_3CN58S_PEDWAW_1OKFI6

Please click on the link below to upload supporting documents
http://caiso.com/rims_public
Electronic Interconnection Request Submission (cont’d)

New Request
- First Name:
- Last Name:
- Email:
- Confirm Email:
- Requested Project Name:
- Request Type: Interconnection Request

Register

Retrieve Request
- Registration Code: 16AS207_3CN58S_PEDWAW_1OKFI6

Submit
Electronic Interconnection Request Submission (cont’d)

NOTE: The Interconnection Request form found on the Generation Interconnection webpage is the **ONLY** version that is compatible with the electronic submission process.

<table>
<thead>
<tr>
<th>Uploaded Files</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uploaded Files</strong></td>
<td></td>
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<td><strong>Uploaded Files</strong></td>
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<td><strong>Uploaded Files</strong></td>
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<tr>
<td><strong>Uploaded Files</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Inventory of Documents to Upload**

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Project Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix DC Appendix 1 - Interconnection Request</td>
<td>A1</td>
</tr>
<tr>
<td>Appendix A to Appendix 1 - Generating Facility Data</td>
<td>A1</td>
</tr>
<tr>
<td>Evidence of Site Exclusivity, including names, addresses, and contact information of site owner(s)</td>
<td>A1</td>
</tr>
<tr>
<td>Site drawing to scale</td>
<td>A1</td>
</tr>
<tr>
<td>Single-line diagram</td>
<td>Synchronous</td>
</tr>
<tr>
<td>Plot of generator terminal voltage vs field current</td>
<td>Synchronous</td>
</tr>
<tr>
<td>Block diagram of excitation system</td>
<td>A1</td>
</tr>
<tr>
<td>Load Flow Model (‘.epc’)</td>
<td>Optional</td>
</tr>
<tr>
<td>Dynamic Modal (‘.dym’)</td>
<td>Optional</td>
</tr>
<tr>
<td>Google Map (‘.kmz’) showing project site</td>
<td>Storage</td>
</tr>
<tr>
<td>Manufacturers Specifications (optional)</td>
<td>As needed</td>
</tr>
<tr>
<td>Reactive Power Curve (optional)</td>
<td></td>
</tr>
<tr>
<td>Storage Supplemental Data Sheet (sheet supplied to ISO after initial IR submission)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**Save As Draft**

☐ By checking this box, you understand that electronic submission is not considered a complete and/or valid Interconnection Request until the CAISO provides acknowledgement within ten (10) Business Days of receipt that the Interconnection Request, which includes the timely receipt of study deposit funds, is deemed complete and/or valid pursuant to CAISO Tariff Appendix DD Section 3.5.2. In the event that the CAISO identifies any deficiencies in the Interconnection request, you will have an opportunity to cure pursuant to Appendix DD Section 3.5.2.2.

Submit Registration for Validation
Electronic Interconnection Request Submission (cont’d)

Upload Project Files

Please add comments after upload
Select a Document Type:
Attachment A to Appendix 1
Choose File  No file chosen

Upload Project Files

Please add comments after upload
Select a Document Type:
Attachment A to Appendix 1
Attachment A to Appendix 1
Evidence of Site Exclusivity
Single-line diagram
Dynamic Model
Google Map
Site drawing to scale
Gen Terminal Voltage vs Field Current
Block Diagram of Excitation System
Load Flow Model
Manufacturers Specifications
Reactive Power Curve
Storage Supplemental Data Sheet
Other Documents

Upload  Cancel
### INTERCONNECTION REQUEST

**Uploaded Files**

<table>
<thead>
<tr>
<th>Document Type</th>
<th>File Name</th>
<th>Uploaded Status</th>
<th>Uploaded Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment A to Appendix 1</td>
<td>New Project Name IR.docx</td>
<td>SUCCESS</td>
<td>02/17/2016 18:05</td>
<td></td>
</tr>
<tr>
<td>Evidence of Site Exclusivity</td>
<td>New Project Name Site Exclusivity.docx</td>
<td>SUCCESS</td>
<td>02/17/2016 18:03</td>
<td></td>
</tr>
</tbody>
</table>

Save As Draft

By checking this box, you understand that the electronic submission is not considered a complete and/or valid Interconnection Request until the CAISO provides acknowledgement within the ten Business Days of receipt that the Interconnection Request, which includes the timely receipt of study deposit funds, is deemed complete and/or valid. Pursuant to CAISO Tariff Appendix DD Section 3.5.2, in the event that the CAISO identifies any deficiencies in the interconnection request, you will have an opportunity to cure pursuant to Appendix DD Section 3.5.2.2.

Submit Registration for Validation

02/18/2016 11:46:43 Your registration request has been submitted successfully.
Accessing RIMS

Once RIMS access is established via AIM, those provisioned access to a project will be able to:

- See screens that detail the project and its progress
- Access uploaded documents
- Upload documents
- View IC, CAISO and PTO contact information
<table>
<thead>
<tr>
<th><strong>Resource Summary</strong></th>
<th><strong>Interconnection Request Info</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Name:</strong></td>
<td><strong>Contact First Name:</strong> RIMS</td>
</tr>
<tr>
<td><strong>Queue Position:</strong></td>
<td><strong>Contact Last Name:</strong> Tester05</td>
</tr>
<tr>
<td><strong>Queue Date:</strong></td>
<td><strong>Contact Title:</strong> Director</td>
</tr>
<tr>
<td><strong>Project Cost Code:</strong></td>
<td><strong>Signature Date:</strong> 03/21/2016</td>
</tr>
<tr>
<td><strong>Study Type:</strong></td>
<td><strong>Current Interconnection Customer</strong></td>
</tr>
<tr>
<td><strong>Cluster Number:</strong></td>
<td><strong>Interconnection Customer(Legal Name):</strong></td>
</tr>
<tr>
<td><strong>PTO:</strong></td>
<td><strong>Company Type:</strong> Limited Liability Company</td>
</tr>
<tr>
<td><strong>Affected PTO:</strong></td>
<td><strong>State Incorporated:</strong> California</td>
</tr>
<tr>
<td><strong>POI:</strong></td>
<td><strong>Parent Company:</strong> Parent Company</td>
</tr>
<tr>
<td><strong>Voltage Level(kV):</strong></td>
<td><strong>Project Location</strong></td>
</tr>
<tr>
<td><strong>Project Status:</strong></td>
<td><strong>Address:</strong> Address</td>
</tr>
<tr>
<td><strong>Reason For Withdraw:</strong></td>
<td><strong>City:</strong> City</td>
</tr>
<tr>
<td><strong>Project Status Date:</strong></td>
<td><strong>County:</strong> County</td>
</tr>
<tr>
<td><strong>QM Project Standing:</strong></td>
<td><strong>State:</strong> California</td>
</tr>
<tr>
<td><strong>Requested Deliverability:</strong></td>
<td><strong>Zip Code:</strong> 11111</td>
</tr>
<tr>
<td><strong>Current Approved Net MW:</strong></td>
<td><strong>Latitude:</strong> 1234.22</td>
</tr>
<tr>
<td><strong>Comments:</strong></td>
<td><strong>Longitude:</strong> 1234.33</td>
</tr>
</tbody>
</table>

- Project Name: Cluster Project - TEST
- Queue Position: 1A
- Queue Date: 01
- Project Cost Code: 
- Study Type: Queue Cluster Process
- Cluster Number: C9
- PTO: OTHER
- Affected PTO: OTHER
- POI: Otay Mesa Switchyard 230 kV
- Voltage Level(kV): 14S
- Project Status: WITHDRAWN
- Reason For Withdraw: None
- Project Status Date: 10/20/2016
- QM Project Standing: 
- Requested Deliverability: Full Capacity
- Current Approved Net MW: 100
- Comments: my comments
- Contact Title: Director
- Signature Date: 03/21/2016
- Company Type: Limited Liability Company
- State Incorporated: California
- Parent Company: Parent Company
- Address: Address
- City: City
- County: County
- State: California
- Zip Code: 11111
- Latitude: 1234.22
- Longitude: 1234.33
Available RIMS Screens

- Equipment Configuration
- Deliverability
- Project Details
- Documents
- Project Contacts
- Project Specific Audit Log
**Equipment Configuration**

<table>
<thead>
<tr>
<th>General Description</th>
<th>NEw/EXISTING Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>equipment configuration comments with updates</td>
<td>New Generation Facility</td>
</tr>
</tbody>
</table>

**Fuel Type and Generation Type**

<table>
<thead>
<tr>
<th>Generator Type</th>
<th>Fuel Type</th>
<th>Net MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro</td>
<td>Water</td>
<td>55</td>
</tr>
<tr>
<td>Wind Turbine</td>
<td>Wind</td>
<td>222</td>
</tr>
</tbody>
</table>

**Other Generation and Fuel Type**

<table>
<thead>
<tr>
<th>Other Generator Type</th>
<th>Other Fuel Type</th>
<th>Net MW</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>other gen type</td>
<td>other fuel type</td>
<td>444</td>
<td>other comments</td>
</tr>
</tbody>
</table>

**Project Milestones**

<table>
<thead>
<tr>
<th>Type</th>
<th>In Service Date</th>
<th>Trial Operation Date</th>
<th>COD Date</th>
<th>Term of Service</th>
<th>Send COD date change Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR</td>
<td>01/01/2016</td>
<td>02/01/2016</td>
<td>03/01/2016</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>CURRENT</td>
<td>01/01/2016</td>
<td>02/01/2016</td>
<td>03/01/2016</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>FINAL</td>
<td>11/01/2016</td>
<td>11/01/2016</td>
<td>11/01/2017</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

**Downsizing Requests**

<table>
<thead>
<tr>
<th>Date Received</th>
<th>Original MW Size</th>
<th>Post Downsizing MW</th>
<th>Deposit Date</th>
<th>Withdrawn Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Annual Full Capacity Deliverability

<table>
<thead>
<tr>
<th>Received Date</th>
<th>Study Cluster</th>
<th>Assigned MW</th>
<th>Allocation Date</th>
<th>Percentage (%)</th>
</tr>
</thead>
</table>

### TPD Affidavit

<table>
<thead>
<tr>
<th>Affidavit Type</th>
<th>Date Received</th>
<th>Valid</th>
<th>Score</th>
<th>Comments</th>
<th>Allocation Detail (MW)</th>
<th>Accepted (MW)</th>
<th>Parked (MW)</th>
<th>Energy Only (MW)</th>
<th>Withdrawn (MW)</th>
</tr>
</thead>
</table>

Affected Systems Mitigations will appear on Weekly Digest Emails to responsible project contacts as listed in Notification Contacts table when the Current Approved Initial Synchronization Date (from the Project Milestone table) is less than 180 days away, and Affected Status Mitigation Status is not set as complete. Also, a Bulk Loader is available for this table.

### Affected Systems

<table>
<thead>
<tr>
<th>Affected System</th>
<th>Potential or Identified?</th>
<th>Mitigation Type</th>
<th>Mitigation Status</th>
<th>Mitigation Date Completed</th>
<th>Send task reminder?</th>
<th>Notes</th>
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</thead>
</table>

### Transmission as Modeled and Implemented

<table>
<thead>
<tr>
<th>Phase Description</th>
<th>Phase ID</th>
<th>Primary Purpose</th>
<th>Utility Project Status</th>
<th>Phase has SPS/RAS</th>
<th>Approved In-Service Date</th>
<th>Full Network Model DB#</th>
<th>Complete?</th>
</tr>
</thead>
</table>
### Transmission as Identified by Transmission Planning

<table>
<thead>
<tr>
<th>NUID</th>
<th>Study Queue Position</th>
<th>PTO</th>
<th>Type</th>
<th>Upgrade Description</th>
<th>Voltage Needed for</th>
<th>Allocation (%)</th>
<th>Allocated Constant Cost ($)</th>
<th>Allocated Escalated Cost ($)</th>
<th>Estimated Time to Construct (Months)</th>
<th>History</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**RNU Reimbursement ($/MW):**

<table>
<thead>
<tr>
<th>PTO</th>
<th>RNU Cap ($/MW)</th>
</tr>
</thead>
</table>

### Transmission as Modeled and Implemented

<table>
<thead>
<tr>
<th>Phase Description</th>
<th>Phase ID</th>
<th>Primary Purpose</th>
<th>Utility Project Status</th>
<th>Phase has SPF/RAS</th>
<th>Approved In-Service Date</th>
<th>Full Network Model OISF</th>
<th>Complete?</th>
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### Project Details

#### IR Checklist

**Interconnection Request**

<table>
<thead>
<tr>
<th>Checklist Item</th>
<th>Status</th>
<th>Status Date</th>
<th>History</th>
<th>Comments</th>
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<td>Interconnection Request Form</td>
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<td>0 Comments</td>
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<tr>
<td>Study Deposit</td>
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<td>0 Comments</td>
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<td>PTO IR Review</td>
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<td>IR Package</td>
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<td>0 Comments</td>
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<tr>
<td>Scoping Meeting</td>
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<td></td>
<td></td>
<td>0 Comments</td>
</tr>
<tr>
<td>Scoping Meeting Minutes</td>
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<tr>
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#### Phase I Checklist

**Phase I Study**

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#### Phase II Checklist

- GAC Checklist
- Financial Security
- Study Costs
# Study Costs

**Project Status:** WITHDRAWN  
**Amounts Invoiced as of:** 02/21/2017

## Project Billing

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<tr>
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<tr>
<td>Invoked by PTO</td>
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<tr>
<td>Accrued by ISO</td>
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<td>Total</td>
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<td>Study Refund to IC</td>
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<tr>
<td>Invoice to IC</td>
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<td>Payment from IC</td>
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## Cluster Study Charges

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<td>PTO Charges</td>
<td>ISO Charges</td>
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## Uploaded Invoice

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<td>![Link Icon]</td>
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### Uploaded Files

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</tbody>
</table>
If you get this message when attempting to open a document within RIMS --

• **DO NOT BE AFRAID!**
  • Do not “Type your message here”
  • Do not “Send Request”

Simply close the window and try again in 30 minutes
### Project Contacts

**CAISO Project Manager**

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Type</th>
<th>Role</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haitao Xu</td>
<td>ISO Project Manager</td>
<td>ISO Admin</td>
<td><a href="mailto:hxu@caiso.com">hxu@caiso.com</a></td>
<td>(916) 802-0875</td>
</tr>
</tbody>
</table>

Please contact the Project Manager first for project inquiries and activities.

### CAISO Contacts

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Type</th>
<th>Role</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haitao Xu</td>
<td>ISO Engineer</td>
<td>ISO Admin</td>
<td><a href="mailto:hxu@caiso.com">hxu@caiso.com</a></td>
<td>(916) 802-0875</td>
</tr>
<tr>
<td>Judy Brown</td>
<td>ISO Interconnection Specialist</td>
<td>ISO Admin</td>
<td><a href="mailto:jbrown@caiso.com">jbrown@caiso.com</a></td>
<td>916-608-7062</td>
</tr>
<tr>
<td>Raeann Quadro</td>
<td>ISO Queue Management</td>
<td>ISO Admin</td>
<td><a href="mailto:rquadro@caiso.com">rquadro@caiso.com</a></td>
<td>(916) 749-8392</td>
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### External Contacts (from AIM)

<table>
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<tr>
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### Notification Contacts

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<th>Last Name</th>
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<th>Address 2</th>
<th>City</th>
<th>State</th>
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<tbody>
<tr>
<td>John</td>
<td>Smith</td>
<td>IC Primary</td>
<td>notification</td>
<td><a href="mailto:smith@abc.test">smith@abc.test</a></td>
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<td>Arizona</td>
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<td>Susie</td>
<td>Queue</td>
<td>PTO Engineer</td>
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</tbody>
</table>
Planning to submit an Interconnection Request in Cluster 13?

- Submit IR early
  - Establish your RIMS IR registration and access for your team
  - RIMS could reject your IR form for incomplete or invalid information
    PRO TIP: DO NOT CUT AND PASTE INFORMATION!
  - Apply early -- allows time to resolve IR data deficiencies
  - Cluster 13 application window is April 1-15, 2020
Resources

Affidavit for Cluster 5 and Later Queue Clusters seeking Transmission Planning Deliverability
http://www.caiso.com/Documents/AffidavitTemplate-Cluster5-LaterQueueClustersSeekingTPDeliverability.doc

Appendix B to Generator Interconnection Study Process Agreement
http://www.caiso.com/Documents/AppendixB-GeneratorInterconnectionStudyProcessAgreement.doc

Business Practice Manuals (BPM)
  - Generator Interconnection and Deliverability Allocation Procedures (GiDAP)
  - Generator Management
    http://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Generator Management

Deliverability Allocation Customer Options Form
http://www.caiso.com/Documents/DeliverabilityAllocationCustomerOptionsForm.doc

Energy Storage Roadmap
Resources

Generator Interconnection and Deliverability Allocation Procedures Cluster Process Summary

GIDAP Customer Guidelines

Generator Interconnection Webpage
http://www.caiso.com/planning/Pages/GeneratorInterconnection/Default.aspx

Interconnection Request and Generating Facility Data
(Tariff Appendix DD Appendix 1 – IR, and Attachment A to Appendix 1 – Technical Data)

ISO Generator Interconnection Queue
http://www.caiso.com/Documents/ISOGeneratorInterconnectionQueueExcel.xls

Participating Transmission Owner financial security instruments
http://www.caiso.com/planning/Pages/GeneratorInterconnection/GeneratorInterconnectionApplicationProcess/Default.aspx
Resources

Participating Transmission Owner per unit costs
http://www.caiso.com/planning/Pages/GeneratorInterconnection/GeneratorInterconnectionApplicationProcess/Default.aspx

Resource Interconnection Fair Webpage
http://www.caiso.com/informed/Pages/MeetingsEvents/PublicForums/Default.aspx

Sample IR/Tech Data

Tariff Section 25

Tariff Appendix DD (GIDAP)

Technical Bulletin: Reassessment Process Reallocation of Cost Shares for Network Upgrades and Posting
Questions?