Training: Transmission Service and Market Scheduling Priorities – Phase 1

April 28, 2022

Radha Madrigal
Customer Readiness
Housekeeping

- Keep yourself muted to minimize background noise.
- Unmute to ask verbal questions or write questions in the chat pod.
- Raise your hand using WebEx interactivity tools.
Agenda

• This training will cover the following topics:
  – High-level review of changes
  – Application-specific details
  – Process review: Registration in Master File and SIBR terminology
  – Market simulation activities
Objectives: Transmission Service and Market Scheduling Priorities

• Extend current (interim) wheeling through scheduling priorities framework for summer 2022/2023 through May 31, 2024

• Foster coordination between supporting resources and scheduling coordinators submitting high priority exports

• Change how VERs can support high priority exports

• Publish additional requested data and information
## Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Term</th>
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<tbody>
<tr>
<td>BAA</td>
<td>Balancing Authority Area</td>
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<tr>
<td>CMRI</td>
<td>Customer Market Results Interface</td>
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<tr>
<td>DALPT</td>
<td>Day-Ahead Lower Price Taker</td>
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<tr>
<td>DAM</td>
<td>Day-Ahead Market</td>
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<tr>
<td>DAPT</td>
<td>Day-Ahead Price Taker</td>
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<tr>
<td>FERC</td>
<td>Federal Energy Regulatory Commission</td>
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<tr>
<td>GRDT</td>
<td>Generator Resource Data Template</td>
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<tr>
<td>HASP</td>
<td>Hour-Ahead Scheduling Process</td>
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<tr>
<td>HE</td>
<td>Hour-ending</td>
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<tr>
<td>IFM</td>
<td>Integrated Forward Market</td>
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<tr>
<td>IRDT</td>
<td>Intertie Resource Data Template</td>
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<table>
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<tbody>
<tr>
<td>LPT Export</td>
<td>Lower Price Taker Export</td>
</tr>
<tr>
<td>LPT Wheel</td>
<td>Lower Price Taker Wheel</td>
</tr>
<tr>
<td>NERC</td>
<td>North American Electric Reliability Corporation</td>
</tr>
<tr>
<td>OASIS</td>
<td>Open Access Same-time Information System</td>
</tr>
<tr>
<td>PT Export</td>
<td>Price Taker Export</td>
</tr>
<tr>
<td>PT Wheel</td>
<td>Price Taker Wheel</td>
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<tr>
<td>RA</td>
<td>Resource Adequacy</td>
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<tr>
<td>RTD</td>
<td>Real-Time Dispatch</td>
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<tr>
<td>RTLPT</td>
<td>Real-Time Lower Price Taker</td>
</tr>
<tr>
<td>RTM</td>
<td>Real-Time Market</td>
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<table>
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<tr>
<td>RTPD</td>
<td>Real-Time Pre Dispatch</td>
</tr>
<tr>
<td>RTPT</td>
<td>Real-Time Price Taker</td>
</tr>
<tr>
<td>RUC</td>
<td>Residual Unit Commitment</td>
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<tr>
<td>SC</td>
<td>Scheduling Coordinator</td>
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<td>SIBR</td>
<td>Scheduling Infrastructure and Business Rules</td>
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<tr>
<td>SS-LPT</td>
<td>Self-Schedule Lower Price Taker</td>
</tr>
<tr>
<td>SS-STD</td>
<td>Self-Schedule Standard (also known as a Self-Schedule Price Taker)</td>
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<tr>
<td>TOR</td>
<td>Transmission Ownership Rights</td>
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<tr>
<td>UI</td>
<td>User Interface</td>
</tr>
<tr>
<td>VER</td>
<td>Variable Energy Resource</td>
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TRANSMISSION SERVICE AND MARKET SCHEDULING PRIORITIES – PHASE 1
Implementation timeline

• Tariff amendment filed with FERC: January 27, 2022
  – FERC approval obtained March 15, 2022

• Market simulation window: May 3 – 20, 2022

• Production activation target date: June 1, 2022
BACKGROUND: HIGH-LEVEL REVIEW OF CHANGES
Extend interim wheeling through scheduling priorities

- High-priority wheels are available for external load serving entities that are planning on using the ISO system to meet their reliability needs.

- High-priority wheels are established by:
  - Notifying the ISO 45 days prior to the month the MW quantity of the wheel.
  - Attesting that they have secured firm transmission to the ISO border for the entire month.

- This change will now expire June 1, 2024 (previously set to expire in 2022).

- Allows for time to focus on long-term solution to establish a transmission reservation process (Phase 2).
Foster coordination between supporting resources and scheduling coordinators submitting high priority exports

- Provide additional visibility of non-RA capacity for a supporting resource
- Provide notification when a high priority export (PT export) schedule exceeds the non-RA capacity of the supporting resource
- Information will be provided via the SIBR tool to scheduling coordinators on the generator and the export side
Change how VERs can support high priority exports

CURRENT:
• Rules require that resources supporting high-priority exports have sufficient capacity for the entire hour (based on forecast at time of bid submission)

NEW:
• Require VER supporting high-priority exports be based on the most recent forecast ahead of the real-time market close for the relevant hour
• This change sets the expectation that if the forecast changes, an SC for a high priority, non-recallable export should update its bid accordingly
Publish additional requested data and information

• Manual reports posted to caiso.com
  – Aggregate historical resource adequacy import data
  – Aggregate data on registered high-priority wheeling transactions

• OASIS
  – Load forecast adjustments in RUC, HASP, RTPD, and RTD
  – Data on aggregate schedule reduction in RUC and HASP
Questions
SIBR
OASIS
Manual Reports

REVIEW APPLICATION-SPECIFIC DETAILS
SC of supporting resource will have instantaneous visibility of available capacity in SIBR

- SIBR will calculate the hourly total self-scheduled exports submitted by SCs for the same designated supporting resource ID for each supporting resource before the market close in DAM and RTM
  - Display: Designated supporting resource ID, non-RA capacity, total submitted self-scheduled PT exports
  - Timeframe: Whenever PT export resources submit schedules
SCs will receive notification when the sum of PT export schedules exceed non-RA capacity of supporting resource

- SIBR will notify SCs of PT export schedule and supporting resource when the latest submission of self-scheduled export causes the sum of schedules to exceed the non-RA capacity
  - Method of notification: Export Priority Report tab (in addition to SIBR validation rules)
  - Timeframe: Whenever PT export resources submit schedules, before close of DAM or RTM
  - Market participant action: SCs should coordinate to resubmit/adjust PT exports to maintain PT priority prior to market close
- If resource non-RA capacity is not sufficient to cover all associated PT export self schedules, they will be converted to DALPT or RTLPT self-schedules
Example 1:
- One resource with total eligible export capacity of 22.36 in HE 11
- Supporting two 10 MW exports
- 2.36 MW unused capacity

Example 2:
- One resource with total eligible export capacity of 14.4 in HE 13
- Identified as supporting two 10 MW exports
- SCs should coordinate to resubmit/adjust exports to prevent both exports from being converted to lower priority
Example 1:
- All exports for HE 11 are fully supported indicating the bids will retain PT status at this time.

Example 2:
- 25 MW export is fully supported.
- Neither 10 MW export is fully supported and will be converted to lower priority if not adjusted/resubmitted prior to market close for HE13.
The ISO will publish RUC load forecast adjustment

- Report navigation path: OASIS > System Demand > Load Adjustments
- RUC load forecast adjustment will provide the MW targets the market will use to clear RUC each hour to cover uncertainty

- Reason will be provided, such as:
  - demand response, load forecast error (used to cover load uncertainty), fire danger, weather change, reliability coordinator next day studies, potential loss of resources (used for solar variability), stranded capacity, or reliability concerns

Note: Sample report not populated with data
The ISO will publish RUC aggregated schedule reduction

- Report navigation path: OASIS > Energy > Schedule > Schedule Reductions

Note: This is sample data, not fully populated
The ISO will publish RUC aggregated schedule reduction

- Hourly aggregated MW schedule reduction in RUC right after instruction issued for: wheel through transaction, import, exports, load reduction

- Summarized by BAA, by TOR, DAPT, DALPT, economic, by system and by tie points

- RUC schedule reduction represents the difference between IFM and RUC
  - Reduction occurs due to lack of transmission capability

- RUC schedule reduction data published to downstream systems
  - Individual resource data provided in CMRI (status quo)
  - Aggregate data on OASIS
The ISO will publish HASP, RTPD, and RTD load forecast adjustments

Note: Sample reports not populated with data

- Report navigation path: OASIS > System Demand > Load Adjustments
- Load forecast adjustment reason will be provided, such as: load deviation (used to cover load uncertainty), software issues, reliability event, resource deviation (used for solar variability)
The ISO will publish HASP schedule reductions

Note: This is sample data, not fully populated

- Report navigation path: OASIS > Energy > Schedule > Schedule Reductions
The ISO will publish HASP schedule reductions

- Calculate the aggregated MW schedule reduction in HASP hourly block right after the instruction issued for: Wheel, import, exports, load reduction
  - Note: HASP adjustments represent the difference between RUC and HASP

- Summarized by BAA, by TOR, DAPT, DALPT, RTPT, RTLPT, economic, by system and by tie points

- HASP schedule reduction data published to downstream systems
  - Individual resource data provided in CMRI (status quo)
  - Aggregate data on OASIS
## Manual report: Historical Resource Adequacy Import Aggregate Data

**Report details:**
- Aggregate RA import showing at scheduling points
- One-time report that contains 2 years of historical data

**Report location:**
caiso.com > Planning > Reliability Requirements > Wheeling and resource adequacy imports aggregate data > Historical Resource Adequacy Import Aggregate Data

Manual report: Priority Wheeling Through Transactions Data

Report details:
- Aggregate PT wheel registrations at import/export points
- Updated with new registrations submitted

Report location:
caiso.com > Planning > Reliability Requirements > Wheeling and resource adequacy imports aggregate data > Priority Wheeling Through Transactions Data

https://www.caiso.com/Documents/PriorityWheelingThroughTransactionsData.xlsx
Questions
Registration in Master File
SIBR Terminology

PROCESS OVERVIEW
Registration in Master File: Which form should I use?

**Generator Resource Data Template**
- Identify ISO internal supply resources that can support PT export
- Update existing data via Master File UI or API

**Intertie Resource Data Template**
- Identify export system resources that can support PT wheel
- Update existing data via Master File UI or API

**New Intertie Resource Request**
- Register high-priority wheel
- Send requests to RDT@caiso.com
GRDT: Identify resources that can support PT export

• Master File flag identifies ISO internal supply resources that can support PT export (will default to null)
  – **EXP_SUPPORT** field on GRDT

• By submitting the flag for designated resource, the SC can confirm:
  – The resource is capable at the time of bid submission of supporting an hourly block schedule over the entire relevant operating hour equal to the PT export quantity
  – A variable energy resource can support the export quantity in all 15-minute intervals
  – The designated capacity has been forward contracted only with an external load serving entity
Generator resource data template (GRDT)

- Submit GRDT with **EXP_SUPPORT** column set to Y to identify ISO internal supply resources that can support PT export
- Updates are subject to the Master File 5-business day timeline
IRDT: Identify resources that can support PT wheel

- Master File flags identify export system resources that can support PT wheel (will default to null)
  - **PT_WHEEL_SCHED** and **PT_WHEEL_MW** fields
  - SC must request PT Wheel ID to activate fields, or designate an existing export resource ID by populating these fields in the IRDT

- SCs can define a wheel schedule as a high priority wheel by:
  - Creating new export system resource that will be designated through use of Master File flag as capable of supporting a PT wheel (i.e. meets all attestation criteria on next slide)
Identify resources that can support PT wheel (cont’d)

• By submitting PT wheel flag, the SC is attesting that they meet the following criteria:
  – PT Wheel supported by a firm supply contract to serve load in another BAA outside the CAISO for the month
  – PT Wheel supported by monthly firm transmission contract from source to CAISO scheduling point for HE 07:00-22:00, Monday through Friday, excluding NERC holidays
Intertie resource data template (IRDT)

- **PT_WHEEL_SCHED** and **PT_WHEEL_MW** fields on IRDT identify export system resources that can support PT wheel
New Intertie Resource Request: Register a high-priority wheel

- Submit **New Intertie Resource Request** form to **RDT@caiso.com**
  - Requests are due 45 days prior to the month

  - Scroll down to the **Resource data submission** section to locate the form
New intertie resource request form

- Refer to the Instructions tab for information on completing the form
Scheduling Infrastructure & Business Rules (SIBR) terminology

• The following terms relate to self-schedules submitted in SIBR:
  – PT export [or SS-STD (Self-Schedule Standard) in SIBR UI]:
    • Self-schedule with designated resource
  – LPT export [or SS-LPT in SIBR UI]:
    • Self-schedule with no identified resource
  – PT wheel:
    • Self-scheduled wheel that meets tariff criteria for high priority wheeling through transaction
  – LPT wheel:
    • Self-scheduled wheel that does not meet tariff criteria for high priority wheeling through transaction

Wheels in SIBR are a bit more complex. The wheel will indicate SS-STD from the import side and could be SS-STD or SS-LPT from the export side. Note: If the wheel is on a registered intertie, the export cannot name a supporting resource.
Questions
Market Simulation

READINESS ACTIVITIES
Market Simulation Activities

• Market simulation structured scenarios provide customers with the ability to preview and test the following items:
  – View resource support capability and export support status (SIBR)
  – View RUC schedule cuts in new OASIS report
  – View HASP schedule cuts in new OASIS report
**Scenario 1: View resource support capability and export support status**

<table>
<thead>
<tr>
<th>Scenario Number</th>
<th>Scenario Execution Trade Date: TBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>View resource support capability and export support status</td>
</tr>
<tr>
<td>ISO Actions</td>
<td>N/A</td>
</tr>
<tr>
<td>EIM Market Participant Actions</td>
<td>N/A</td>
</tr>
<tr>
<td>ISO Market Participant Actions</td>
<td>SCs for supporting resources submit various combinations of bids SCs for export resources submit bids with various energy levels and supporting resources</td>
</tr>
</tbody>
</table>
| Expected Outcome | SCs can use the new UI to view:  
  - For supporting resources, an indication of their total support capability, unused support capability, and a list of export resources which are using the supporting resource.  
  - For export resources, an indication of whether their resource is supported for a trade hour |
| Anticipated Settlement Outcome | N/A                              |
| Expected Settlement Outcome | N/A                              |
### Scenario 2: View RUC schedule cuts in new OASIS report

<table>
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<tr>
<th>Scenario Number</th>
<th>Scenario Execution Trade Date: TBD</th>
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<tbody>
<tr>
<td></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td></td>
<td>View RUC schedule cuts in new OASIS report</td>
</tr>
<tr>
<td><strong>ISO Actions</strong></td>
<td>In RUC, create under-generation conditions that are conducive for cutting load and export schedules.</td>
</tr>
<tr>
<td><strong>EIM Market Participant Actions</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>ISO Market Participant Actions</strong></td>
<td>SCs for export resources submit bids with various energy levels and supporting resources, with the objective of a mix of low and high priority self-schedules</td>
</tr>
<tr>
<td><strong>Expected Outcome</strong></td>
<td>A mix of load, exports, and wheels are cut in the RUC process. SCs can use the new OASIS report to view an aggregated listing of schedule cuts.</td>
</tr>
<tr>
<td><strong>Anticipated Settlement Outcome</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Expected Settlement Outcome</strong></td>
<td>N/A</td>
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Scenario 3: View HASP schedule cuts in new OASIS report

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<tr>
<th>Scenario Number</th>
<th>Scenario Execution Trade Date: TBD</th>
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<tbody>
<tr>
<td>3</td>
<td>Description: View HASP schedule cuts in new OASIS report</td>
</tr>
<tr>
<td></td>
<td>ISO Actions: In HASP, create under-generation conditions that are conducive for cutting load and export schedules.</td>
</tr>
<tr>
<td></td>
<td>EIM Market Participant Actions: N/A</td>
</tr>
<tr>
<td></td>
<td>ISO Market Participant Actions: SCs for export resources submit bids with various energy levels and supporting resources, with the objective of a mix of low and high priority self-schedules</td>
</tr>
<tr>
<td></td>
<td>Expected Outcome: A mix of load, exports, and wheels are cut in HASP. SCs can use the new OASIS report to view an aggregated listing of schedule cuts.</td>
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<tr>
<td></td>
<td>Anticipated Settlement Outcome: N/A</td>
</tr>
<tr>
<td></td>
<td>Expected Settlement Outcome: N/A</td>
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Setup for Market Simulation Activities

• Complete additional setup for structured scenarios by the dates listed below

• Market participants will need to register their request with the ISO to participate in this simulation via the MarketSim@caiso.com mailbox by April 7, 2022

• Users must be provisioned for access in order to participate in market simulation

• Attend the Market Simulation calls to stay informed on the timing of activities for this and other initiatives
Final Questions
Thank you for your participation!

For more detailed information on anything presented, please visit our website at:

www.caiso.com

Or send an email to:
CustomerReadiness@caiso.com
Reference Material

- Business Practice Manual changes:
  - BPM Change Management

- Business Requirements Specification:

- Initiative webpage:
Reference Material

• Market Simulation Structured Scenarios:

• Technical Specifications – located on the [ISO’s Developer Site](https://www.caiso.com) which provides detailed descriptions of the API changes for:
  – OASIS
  – SIBR

• Training Material: Market Enhancements for Summer 2021 Readiness – Load, Export, and Wheeling Through Priorities (initial implementation of enhancements)