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Purpose

Provides guidelines for running the Real-Time Market (RTM) process and for procuring Ancillary Services (AS) in the RTM.
1. Responsibilities

| ISO Generation Desk | • Reviews and allows instructions from RTM to be sent to Market Participants via ADS  
|                      | • Logs all compliance issues  
|                      | • Ensures RTM runs at the designated intervals  
|                      | • Dispatches resources with Exceptional Dispatch as requested by the ISO Shift Manager Desk  
|                      | • **Conform transmission constraints as required for reliability purposes**  
|                      | • Sends market messages as required  
|                      | • Utilizes RTM/Exceptional Dispatch to modify resources in RTM  
|                      | • Adjusts RTM (as needed) for proper Dispatching  

| Scheduling Coordinator (SC) | Submits Energy and Ancillary Service Schedules and Bids for the Real-Time Markets. |

2. Scope/Applicability

2.1. Background

Describes Real-Time Market activities

2.2. Scope/ Applicability

This procedure applies to Real-Time Market activities.

3. Procedure Detail

3.1. Running the RT Market

3.1.1. RT Load Forecast

Take the following actions to forecast Load:

<table>
<thead>
<tr>
<th>ISO Generation Desk</th>
</tr>
</thead>
</table>

Page 2 of 11
1. **Access** the Real-Time Load Forecasting Tool from System Operations Launch Pad.
2. **Update, adjust, and publish** the RT Load Forecast to RTN.

### 3.1.2. RT Ancillary Service Requirement

Take the following actions to review/adjust AS requirements in RTPD:

<table>
<thead>
<tr>
<th>RTPD Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The AS requirements for the HASP and RTUC processes are based on NERC/WECC requirements.</td>
</tr>
</tbody>
</table>

| RT AS is procured on a 15 minute basis, as needed, from resources certified to provide AS. All AS procured in RT is Contingency only. |

| In the event sufficient AS cannot be procured through the ISO Real-time markets, RT Dispatchers may procure additional AS, including from Reliability Must-Run (RMR) Units, to meet NERC/WECC requirements. The ISO will replace such AS with market procured AS as soon as practicable. See also OP 2340A for RMR Units. |

**Note:** *A written confirmation of the RMR A/S dispatch must be sent to the SC within 24 hours of the dispatch.*

<table>
<thead>
<tr>
<th>ISO Generation Desk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If the ISO makes a change after DAM but prior to the close of HASP of a min or max, <strong>issue</strong> a Market Notice as soon as reasonably practicable.</td>
</tr>
<tr>
<td>o <strong>Note:</strong> <em>After the close of HASP, the AS limits used in HASP are published in OASIS.</em></td>
</tr>
</tbody>
</table>

| 2. **Open** the ASRS screen in RTN. |
| o **Review** calculated requirements |
| o **Adjust** market provided reserves as required for reliability |
| o **Update** new requirements to RTN (see [GEN-007 Ancillary Service Requirements Setter](#)) |

| 3. **Determine** whether any forecasted transmission and/or generation constraints exist: |
| o If no transmission and/or generation constraints exist, **go to** Section 3.1.3. |
| o If there are transmission and/or generation constraints, |
|     - **Identify** the applicable unit(s) associated with the constraint(s) (i.e. units not addressed by the use of min's and max's of existing AS sub-regions). |
|     - **Block** AS Bids as necessary. |
|     - **Log** the event. |
4. If additional reserves are necessary and all market mechanisms have been utilized,
   - Ask the ISO Shift Manager Desk whether to issue Dispatch instructions to the Scheduling Coordinators (SCs) for any AS certified Units
   - Refer to Operating Procedure 2340A, Procuring AS Capacity from RMR Units.

5. If AS bids are skipped to maintain the WECC reserve requirement, notify Market Participants

6. If insufficient AS have been procured, refer to Operating Procedure 4420, System Emergency
   - Log any deficiencies.

7. Inform the ISO Shift Manager Desk of any deviations from this procedure and prepare a written report that provides the following information:
   - The procedure from which the deviation occurred
   - A description of the deviation
   - The duration of the deviation
   - A detailed explanation of the reason for the deviation
   - Any system reliability concern that led to the deviation

8. Determine if minimum and/or maximum AS procurement limits are necessary for each or any AS Region.
   - Consider the following:
     - Path Contingency de-ratings
     - Path OTCs
     - Most Severe Single Contingency (on-line Generating Unit or in-service transmission). See section 3.2, ISO Operating Procedure 2230, Most Severe Single Contingency Designation for a list of current MSSCs
     - Forecasted path flows
     - Other anticipated local operating conditions for Load and/or Generation pocket AS Regions

9. If an Outage to a major transmission line results in Supply being curtailed into the Balancing Authority area and the Outage on the transmission line is a credible single Contingency,
   - Consider the transmission event a single largest Contingency for the purposes of determining Operating Reserves.

3.1.3. RT Pre-Dispatch (RTPD)
Take the following actions for RTPD:

### Scheduling Coordinator (SC)

1. **Submit** HASP and RTM Bids 75 minutes before the Operating Hour through SIBR.

### ISO Generation Desk

1. **Ensure** adequate resources are available to meet all system reliability requirements.
2. If additional area resources are required:
   - Consider conforming impacted element per Operating Procedure 2220, *Transmission Conforming*.
   - Consider adjusting and publishing to RTN a revised RT Load Forecast.
   - Consider committing additional units in RTN using Exceptional Dispatch per Operating Procedure 2330, *Real-Time Exceptional Dispatch*.
3. **Review** HASP results, including Intertie Dispatches.
   - Modify or block results as necessary to meet reliability requirements.
4. If HASP robustness has occurred,
   - Adjust the Interties as needed and,
   - Request RTMO to manually publish the Interties and commitments.
     - **Note:** The HASP Market results are published automatically to the Customer Market Results Interface (CMRI) and ADS to notify Market Participants of their commitments and advisory status.
     - **Note:** Short Term Unit Commitment (STUC) will run automatically at T-52.5 minutes.
5. **Determine** if STUC has run properly and output is feasible.
   - If results are acceptable, take no action
   - If results are not acceptable, determine whether results need to be modified, then adjust as necessary to meet reliability requirements.
6. **Determine** if additional Dispatch Instructions are needed based on the CFCD and the STUC Dispatches.
   - Communicate any additional Dispatch Instructions through Exceptional Dispatch instructions
   - Refer to Operating Procedure 2330, *Real-Time Exceptional Dispatch*.
7. **Repeat** Steps 7 and 8 for the remaining RTPD runs.

### 3.1.4. RT Dispatch

Take the following actions for RT Dispatch (RTD)
ISO Generation Desk

1. **Adjust** the 5 minute RT Load Forecast as necessary to ensure reliability requirements are met.
2. **Review** the RTD results
   - **Adjust** results as necessary to meet reliability requirements.
3. After issuing a 5 minute Dispatch,
   - **Verify** the Dispatch transferred to ADS, and
   - **Monitor** the Market Participants’ response to ADS instructions to ensure reliability requirements are met.
     - If ADS is not functioning properly, refer to Operating Procedure 5410, Communication/Applications Loss/Failure
     - If the State Estimator (SE) is not functioning properly,
       - **Evaluate** the need to request RTMO to switch Dispatch Initialization Source to EMS.
       - **Refer** to Generation Desktop Procedure GEN-001, State Estimator.
     - If RTM is not functioning properly, **dispatch** resources as required via ADS or manually through an Exceptional Dispatch. Refer to Operating Procedure 2330, Real-Time Exceptional Dispatch.

3.1.5. RT Contingency Dispatch

Take the following actions to address Contingencies in RT:

ISO Generation Desk

- **Note:** The Disturbance Recovery Period is 15 minutes after the start of a Reportable Disturbance.
- **Note:** The Contingency Reserve Restoration Period is 60 minutes.
- **Note:** The Real-Time Contingency Dispatch (RTCD) can be activated at any time to address Contingencies by Dispatching contingent Operating Reserves.
2. **Manually execute** RTCD. Refer to Desktop procedure GEN-015, Real-Time Contingency Dispatch.
3. **Consider** requesting RTMO to check “Run RTD Power Flow” option in market software prior to initiating the Contingency Dispatch.
4. **Determine** whether requirements are met
5. **Review** the Dispatches and **adjust** as necessary.
   - If Emergency Operations conditions exist such as reserve shortages, Load Shedding, Black Start restoration, etc.,
     - **Refer** to Operating Procedure 4420, System Emergency
     - **Determine** emergency requirements
6. **Issue** the RTCD instructions to the Market Participants.
7. If the system is recovered from the Contingency situation, return the Dispatched Contingency reserves back to Contingency reserves in a manner that does not cause frequency or Area Control Error (ACE) excursions.

3.1.6. RT Manual Dispatch

Take the following actions whenever the RTD fails to converge because of bad data, network model issues, or optimization engine failure:

<table>
<thead>
<tr>
<th>ISO Generation Desk</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. If RTD Requirements are not met, adjust the 5 minute forecast while in RTMD to get the desired quantity.</td>
</tr>
<tr>
<td>3. If RTMD Dispatch instructions do not produce the desired results,</td>
</tr>
<tr>
<td>o Issue Exceptional Dispatch instructions</td>
</tr>
<tr>
<td>o Refer to Operating Procedure 2330, Real-Time Exceptional Dispatch</td>
</tr>
<tr>
<td>o If reasons for Exceptional Dispatch no longer exist, issue RTMD Dispatch instructions only, OR</td>
</tr>
<tr>
<td>o Refer to Operating Procedure 4420, System Emergency</td>
</tr>
<tr>
<td>o When a bid is removed to resolve Market Disruption, Refer to Operating Procedure 2710, Market Disruption - RTM Failure</td>
</tr>
</tbody>
</table>

3.2. Real-Time Timelines

The following diagrams attached below in the image section describe the HASP/STUC/RTPD and RTED timelines:
4. Supporting Information
Operating Procedure

Real-Time Market Activities
(Formerly M-403, M-403A, M-403B)

Distribution Restriction: None

Operationally Affected Parties

Shared with Public.

References

Resources studied in the development of this procedure and that may have an effect upon some steps taken herein include but are not limited to:

<table>
<thead>
<tr>
<th>CAISO Tariff</th>
<th>GEN-007 Ancillary Service Requirements Setter</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAISO Operating Procedure</td>
<td></td>
</tr>
<tr>
<td>NERC Requirements</td>
<td>BAL-002-1 R4.2</td>
</tr>
<tr>
<td>WECC Criterion</td>
<td></td>
</tr>
<tr>
<td>Other References</td>
<td>Desktop Procedures:</td>
</tr>
<tr>
<td></td>
<td>1. GEN-001, State Estimator GEN-007,</td>
</tr>
<tr>
<td></td>
<td>2. Ancillary Service Requirements Setter</td>
</tr>
<tr>
<td></td>
<td>3. GEN-015, Contingency Dispatch</td>
</tr>
</tbody>
</table>

Definitions

Unless the context otherwise indicates, any word or expression defined in the Master Definitions Supplement to the CAISO Tariff shall have that meaning when capitalized in this Operating Procedure.

The following additional terms are capitalized in this Operating Procedure when used as defined below:

<table>
<thead>
<tr>
<th>AS</th>
<th>Ancillary Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robustness</td>
<td>HASP Robustness occurs when HASP is given more time to run than normal (it actually steals time from STUC if there is time available)</td>
</tr>
<tr>
<td>RTD</td>
<td>Real-Time Dispatch</td>
</tr>
<tr>
<td>RTCD</td>
<td>Real-Time Contingency Dispatch</td>
</tr>
<tr>
<td>RTMD</td>
<td>Real-Time Manual Dispatch</td>
</tr>
<tr>
<td>RTPD</td>
<td>Real-Time Pre-Dispatch</td>
</tr>
</tbody>
</table>

Version History

<table>
<thead>
<tr>
<th>Version</th>
<th>Change</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure No.</td>
<td>Version No.</td>
<td>Effective Date</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
<td>----------------</td>
</tr>
<tr>
<td>2210</td>
<td>10.7</td>
<td>1/27/2017</td>
</tr>
</tbody>
</table>

### Real-Time Market Activities
(Formerly M-403, M-403A, M-403B)

**Distribution Restriction:** None

| 8.0 | Annual review. Added RT Load Forecast and removed VSTLP. Added step 3.6 for adjusting ties if there is HASP robustness. | 3/10/2010 |
| 9.0 | Reformatted for new prototype | 5/1/2011 |
| 9.1 | On 5/1/11, During the reformat process: Added Responsibilities, Scope/Applicability, and Periodic Review Criteria. Sections 1-6 of the old (M-403) procedure moved to Procedure Detail in Section 3.0. Added section 3.2.2 Bypassing Specific Locational AS Bids, (M-403A) 3.2.1 (M-403B) 3.3 Real-Time Timelines. This change is minor explaining in detail changes in the reformat process. | 5/24/2011 |
| 10.0 | Annual Review: Section 3.1.1: Edited step 1. Section 3.1.2: Edited RTPD Description and steps 2-5, 8. Section 3.1.3: Edited steps 1-3, 6 (note), 8-10. Section 3.1.4: Edited steps 1-3. Section 3.1.5: Edited initial notes. Section 3.1.6: edited step 3. | 11/20/2012 |
| 10.1 | Page 2, under "Responsibilities" removed RT Scheduler and the two bullet items. | 1/15/2014 |
| 10.2 | 3.1.4 Deleted verbiage to log in SLIC. 3.1.6 Changed "Merit Order" to "Manual" to be consistent with Tariff language. | 3/13/2014 |
| 10.3 | Section 3.1.3: Updated CMRI reference. | 12/17/2014 |
| 10.4 | Removed references to MOSES and SLIC. Page 3: Updated RTPD Description table. Page 6: Added verbiage to request RTMO to manually publish HASP robustness results. Page 8: Changed role from Generation Dispatcher to RTMO when switching to SE, removed ower flow in EMS reference (it no longer exists) and changed verbiage to request RTMO to run power flow. Page 10: Updated RTPD Timeline. Section 3.1.2: Replaced RTPD Description table per Legal. | 10/1/2015 |
| 10.6 | Converted procedure from SharePoint Word to Centric. | 3/9/2016 |
| 10.7 | Section 3.1.6, step 1. Changed Merit Order to Manual to align with the Tariff. Updated section 3.1.3 to include language about bid removal and proper notification of the affected scheduling coordinator; Section 3.1.6 RT Manual Dispatch. Changed the role names used in this procedure to their new role names. | 1/27/2017 |
5. Periodic Review Procedure

Review Criteria & Incorporation of Changes

There are no specific criteria for reviewing or changing this document, follow instructions in Procedures 5510 and 5520.

Frequency

Every 3 Years

Appendix

2210Z Effectiveness Factors - All
2210D Ancillary Service Blocking and Disqualification