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Appendix **16**

Purpose

Provides guidelines for mitigating an Hour-Ahead Scheduling Process (HASP) failure, a Real-Time Dispatch (RTD) failure, a Real-Time Contingency Dispatch (RTCD) failure, a Real-Time Pre-Dispatch (RTPD) failure, or a suspension of the Real-Time Market.

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1. Responsibilities

California ISO (CAISO) Generation Dispatcher	• Reviews and allows instructions from RTM to be sent to Market Participants via ADS. • Communicates the need for any Intertie changes to the Transmission Dispatcher. • Dispatches resources with Exceptional Dispatch as required. • Sends ADS messages as required. • Sends market (MNS) messages as required.
CAISO Market Operator (MO)	• Monitors Real-Time Market software for proper operations and solutions. • Sends EverBridge messages as required. • Determines when to isolate a Western Energy Imbalance Market (WEIM) entity from the Real-Time Market in coordination with the WEIM Operator. • Takes action to resolve failures.
CAISO Critical Systems Support (CSS)/Market Engineering Support (MES)	• Resolves issues that prevent the Real-Time Market software from proper operations and solutions.
CAISO Director, Balancing Authority (BA) Operations / CAISO Manager of BA Operations	• Instructs CAISO Generation Dispatcher to send out notifications to Market participants.

2. Scope/Applicability

2.1. Background

The Real-Time Market may experience disruptions, which may result in HASP failure, RTD failure, RTCD failure or RTPD failure.

In the event of a Real-Time Market failure, market results will be applied in accordance with Tariff Section 7.7.9(c) and 7.7.9(e).

The CAISO may suspend the Real-Time Market if it is determined that such suspension is necessary to prevent, contain, or correct a System Emergency. These interventions may occur on a Balancing Authority area-wide basis or with respect to islanded portions of the Balancing Authority Area.

Note: *A Market Suspension differs from a Market Isolation of a WEIM entity. When the Real-Time Market is suspended, the market is not solving for any WEIM entity, including the CAISO BA. Refer to CAISO Operating Procedure 2720 Market Disruption – Western Energy Imbalance Market (WEIM) for further details.*

Prior to CAISO suspending the Real-Time Market, the CAISO BA must, to the extent the CAISO BA considers it necessary to resolve the System Emergency:

1. Dispatch all supply and ancillary services bids.
2. Dispatch all interruptible loads.
3. Exceptionally Dispatch resources.
4. Dispatch all curtailable demand and exercise its rights with respect to any load curtailment contracts.
5. Perform involuntary load shedding.

In the event of a Real-Time Market suspension, Administrative Prices will be applied in accordance with Tariff Section 7.7.9(d) and 7.7.9(e).

2.2. Scope/ Applicability

This procedure is applicable when the Real-Time Market fails, or when the CAISO suspends the Real-Time Market.

2.3. Market Participant Expectations

In the event of a Market Failure, every resource owner/operator should be able to take manual control of their resource(s) and be able to follow direction given to them by the Generation Dispatcher. These instructions can include Energy and/or Ancillary Services. Failure to respond/follow these instructions can be deemed as failing to follow an operating instruction for reporting purposes.

3. Procedure Detail

3.1. HASP Processing and Failure

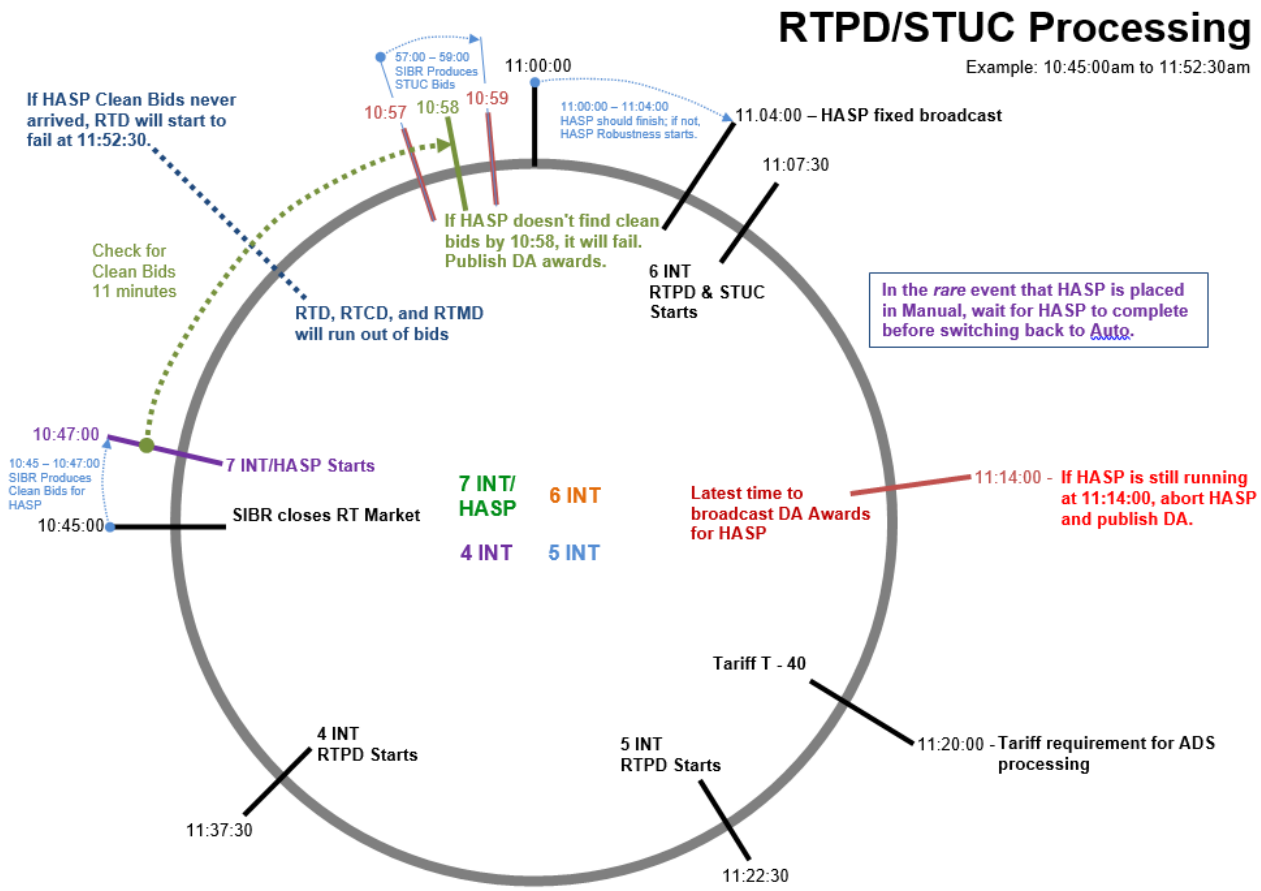
The following provides information about HASP timelines and processing and guidance for HASP failures:

- HASP run starts at ~ XX:47:00.
- When HASP starts the, 'find updated inputs,' process within RTPD workflow checks for Bids. If Bids are not there, this process keeps checking for up to 11 minutes for Bids to show up.
- This process will automatically continue to check for Bids up until XX:58:00.

Once Bids are detected, the RTPD (HASP) process will continue.

If Clean Bids are not received by XX:58:00, HASP will fail.

3.1.1. RTPD/STUC Processing



Note: *Market processing and publication timelines are approximate.*

3.1.2. HASP Processing and Failure Details and Actions

CAISO Generation Dispatcher

1. If HASP fails or auto aborts at XX:14:
   - RTPD AS Advisories and DA RUC Intertie schedules will be **sent** to ADS by default.
2. If Advisory AS Awards are not sent,
   - **Send** the following message **via** MNS and ADS:

   "The CAISO has had a market disruption of HASP for HE [HH], FMM interval ending [HH:45].

   Ancillary Services Awards follow their advisory AS awards.

   Hourly block and FMM Intertie resources are instructed to follow their HASP advisory market awards for energy. If no HASP advisory energy award is available, revert to the binding day-ahead RUC awards. The CAISO is investigating the cause of the disruption and will inform Market Participants when the issue is resolved."

   ***Note:** If DA RUC award is 0 MW and HASP run fails, the advisory will be 0 MW. ITS will auto adjust the E-Tag to 0 MW at xx:20.*
3. If DA Awards are not sent for both AS and Interties,
   - **Send** the following message **via** MNS and ADS:

   "The CAISO has had a market disruption of HASP for HE xx FMM interval ending [HH:45]. Ancillary Services Awards revert to Day-Ahead Market Awards.

   Hourly block and FMM Intertie resources are instructed to follow their HASP advisory market awards for energy. If no HASP advisory energy award is available, revert to the binding day-ahead RUC awards. The CAISO is investigating the cause of the disruption and will inform Market Participants when the issue is resolved."

   ***Note:** If DA RUC award is 0 MW and HASP run fails, the advisory will be 0 MW. ITS will auto adjust the E-Tag to 0 MW at xx:20.*
4. If Additional Intertie Resources are needed,
   - **Request** Transmission Dispatcher to utilize Manual Dispatch per CAISO Operating Procedure 2530 Manual Dispatch on Interties.

CAISO Market Operator

1. **Performs** steps detailed in CAISO Operating Procedure 2720 Market Disruption – Western Energy Imbalance Market (WEIM).

3.2. RTD Dependencies

Take the following actions as soon as HASP Bids and STUC Bids are available:

CAISO Critical Systems Support (CSS)
1. **Investigate** cause and **rectify**. 2. If clean Bids did not show up for the HASP run, for example HE13 (HASP run of 10:47:00), RTD will start to fail at 11:52:30 in the RTD run: • **Manually push** the clean Bids and STUC Bids (depending upon what is missing) after resolving the issues that prevented the Bid processing. • **Inform** the CAISO Generation Dispatcher and Market Ops Support that Bids are available for the missing hour. ***Note**: No action should be taken by Operations.*

3.3. RTD Failure

Take the following actions as soon as HASP Bids and STUC Bids are available:

CAISO Generation Dispatcher
1. **Notify** Service Desk support personnel about the issue. 2. If Advisory Results are available, they will be **automatically sent** to ADS by RTM. • The Market Participants are expected to follow the ADS advisory dispatches they receive when RTD fails. ***Notes:*** *There will only be ~ 1 hour of advisory dispatches, should RTD fail repeatedly.* *Be prepared to **inform** the Market participants of this potential issue.* *RTPD **may** still be solving and issuing startups/shutdowns that will be sent to ADS, but resources will not receive the subsequent DOT if RTD continues to fail.* 3. If Advisory Results are NOT available, Either: • **Instruct** resources to follow their last ADS dispatch unless told otherwise. • **Send** the following market message **via** MNS and ADS: *"Attention Market Participants: The CAISO Real-Time Market has experienced an RTD disruption; Unless manually dispatched otherwise by a CAISO Real-Time Operator, all resources that respond to RTD are*

CAISO Generation Dispatcher

instructed to remain at their last DOT. Hourly block and FMM intertie resources are instructed to follow their HASP and FMM market awards.

The CAISO is investigating the cause of the disruption and will inform Market Participants when the issue is resolved.

Or:

- **Instruct** resources to follow DA schedules depending on system conditions unless told otherwise.
- **Send** the following market message **via** ADS and MNS:

  "Attention Market Participants: The CAISO Real-Time Market has experienced a disruption; all resources are instructed to follow their Day-Ahead schedules unless manually dispatched otherwise by the CAISO Generation Dispatcher. The CAISO is investigating the cause of the disruption and requests Market Participants to review their IFM (Day-Ahead) schedules."

  ***Note:** There may be instances where some resources may be instructed to remain at their last DOT (Step 3a), while other resources are instructed to follow their DA schedule (Step 3b).*

4. **Coordinate** infeasible Schedules with participants **via** SLIC or Exceptional Dispatch.
5. **Monitor** next interval for successful run.
6. If the application has failed for > forty-five (45) minutes (*Advisory dispatches will be unavailable*),
   - **Advise** units to go to the non-binding advisory Dispatch from ADS that have not been updated from the last good interval; **or**
   - **Hold** unit where it was last Dispatched **via** a Notice in the MNS and ADS.
   - If failure of RTD while in manual is observed:
     - **Use** Exceptional Dispatch authority to control units and/or Contingency Dispatch, if available.
     - **Utilize** ARMS Inc/Dec for Intertie resources.
     - **Issue** Exceptional Dispatch for internal resources or if a unit is needed for RTPD for commitment (Start-Up or shutdown).
7. **Coordinate** with support personnel to restore system to normal.
8. Upon notification from the Market Operator that a Bid has been removed (effectively makes the resource non-participating) from any market run to mitigate a Market Disruption, the Generation Dispatcher will:
   - **Notify** the Scheduling Coordinator **via** phone call immediately or as soon as practicable, but no later than three (3) Business Days, after the applicable Bid was removed, and

CAISO Generation Dispatcher
• **Provide** information **specifying** when its Bid was removed and the nature of the disruption.

CAISO Market Operator
1. **Performs** steps detailed in CAISO Operating Procedure 2720 Market Disruption – Western Energy Imbalance Market (WEIM).

CAISO Critical Systems Support (CSS) / Market Engineering Support (MES)
1. **Investigate** cause and **rectify**.

3.4. RTCD Failure

Take the following actions if RTCD fails:

CAISO Generation Dispatcher
1. Do one of the following: • **Click "**Reactivate" to reset the Contingency Dispatch Process. • **Attempt to re-run** the Contingency Dispatch; or • **Determine** available Dispatching options **via** RTD interval Dispatch, or utilization of Exceptional Dispatch authority. ***Note:*** *Dispatch units manually/verbally over phone.* 2. **Contact** MES.

3.5. RTPD Failure

Take the following actions if RTPD fails:

CAISO Generation Dispatcher
1. **Contact** Market Operations support personnel. 2. **Send** the following messages if the RTPD fails and is unable to send advisories: *"The CAISO has experienced a market disruption of RTUC for the binding interval [HH:MM] in HE [XX]. Ancillary Services Awards will revert to Day-Ahead Awards. Hourly block and FMM Intertie resources are instructed to follow their HASP advisory market awards for energy. If no HASP advisory energy award is available, revert to the binding day-ahead RUC awards.*

CAISO Generation Dispatcher

The CAISO is investigating the cause of the disruption and will inform Market Participants when the issue is resolved."

***Note:** If DA RUC award is 0 MW and HASP run fails, the advisory will be 0 MW. ITS will auto adjust the E-Tag to 0 MW at xx:20.*

3. **Post** the notice in MNS and ADS with participants about use of prior HASP or DA Dispatch Instructions and
   - **Include** the associated time.
4. **Use** Exceptional Dispatch if a unit is needed for RTPD for commitment (Start-Up or shutdown).
5. **Identify** reserve obligation requirements and
6. **Commit** as needed.
7. **Log** event in SLIC.
8. If RTPD Fails for multiple intervals:
   - **Combine** and **follow** both HASP and pre-Dispatch failure processes starting with applicable process failure.
   - **Consider** if transmission events may require model update and
   - **Request** Market Operator to run RTD with power flow to ensure topology updates for RTD interval Dispatches.
   - **Escalate** issue with support personnel.
9. **Log** event in SLIC and
10. **Coordinate** with support personnel to **restore** system to normal.
11. Upon notification from the Market Operator that a Bid has been removed (effectively makes the resource non-participating) from any market run to mitigate a Market Disruption, the Generation Dispatcher will:
    - **Notify** the Scheduling Coordinator as soon as practicable, but no later than three (3) Business Days, after the applicable Bid was removed and
    - **Provide** information specifying when its Bid was removed and the nature of the disruption.

CAISO Market Operator

1. **Performs** steps detailed in CAISO Operating Procedure 2720 Market Disruption – Western Energy Imbalance Market (WEIM).

3.6. HASP/RTPD/RTUC/RTD Disruptions: Hold Last DOT or Revert to DA Schedules

Send the following messages if there is a complete market disruption of HASP, RTPD, RTUC, and RTD and there is a need to either hold the last DOT or revert to DA schedules.

CAISO Generation Dispatcher
1. **Hold** the Last DOT. *"The CAISO markets have experienced a disruption; unless manually dispatched otherwise by a CAISO Real-Time Operator, all resources that respond to RTD dispatches are instructed to follow their last DOT.* *Ancillary Services without FMM Awards revert to Day-Ahead Market Awards.* *Hourly block and FMM Intertie resources are instructed to follow their HASP advisory and FMM market awards if available, if no HASP advisory or FMM market awards are available, revert to day-ahead market RUC awards.* *The CAISO is investigating the cause of the disruption and will inform Market Participants when the issue is resolved."* 2. **Revert to** DA Schedules. *"The CAISO markets have experienced a disruption; unless manually dispatched otherwise by a CAISO Real-Time Operator, all resources that respond to RTD dispatches are instructed to follow their Day-Ahead market results including RUC awards.* *Ancillary Services without FMM binding Awards revert to Day-Ahead Market Awards.* *Hourly block and FMM Intertie resources are instructed to follow their HASP advisory and FMM market awards if available, if no HASP advisory or FMM market awards are available, revert to day-ahead RUC awards.* *The CAISO is investigating the cause of the disruption and will inform Market Participants when the issue is resolved."*

CAISO Market Operator
1. **Performs** steps detailed in CAISO Operating Procedure 2720 Market Disruption – Western Energy Imbalance Market (WEIM).

3.7. Suspension of the Real-Time Market

Market Suspension is a market disruption with significant impacts to the market footprint and participating entities resulting in the Market Operator purposefully stopping (i.e., suspending) the markets for all WEIM participants to prevent, contain, or correct a System Emergency or prolonged widespread event where the market is unable to execute reliably for the WEIM footprint for an extended period of time.

Take the following actions when CAISO Market Operator decides to suspend the Real-Time Market:

CAISO Market Operator
1. **Performs** steps detailed in CAISO Operating Procedure 2720 Market Disruption – Western Energy Imbalance Market (WEIM).

CAISO Director, BA Operations / CAISO Manager of BA Operations
1. If notified of the decision to **suspend** the Real-Time Market, • **Instruct** the CAISO Generation Dispatcher to **notify** Market Participants that the Real-Time Market is suspended.

CAISO Generation Dispatcher
1. If the CAISO Director, BA Operations of System Operations or CAISO Manager of BA Operations is notified of the decision to suspend the Real-Time Market. • **Notify** Market Participants, **via** MNS, that the Real-Time Market is suspended, • **Indicate** the start time XX:XX and expected duration for the suspension of the Real-Time Market. • **Use** the MNS Notification Template in Section 3.8.

3.8. Resumption of the Real-Time Market

Take the following actions when the CAISO decides to resume the Real-Time Market:

CAISO Market Operator
1. **Performs** steps detailed in CAISO Operating Procedure 2720 Market Disruption – Western Energy Imbalance Market (WEIM).

CAISO Director, BA Operations / CAISO Manager of BA Operations
1. If notified of the decision to **resume** the Real-Time Market, • **Instruct** the CAISO Generation Dispatcher to **notify** Market Participants that the Real-Time Market is no longer suspended, starting dispatches received after XX;XX.

CAISO Generation Dispatcher
2. If the CAISO Director, BA Operations or CAISO Manager of BA Operations is notified of the decision to **resume** the Real-Time Market, • **Notify** Market Participants, **via** MNS, that the Real-Time Market is no longer suspended and • **Indicate** that the time the Real-Time Market will be resumed. • **Use** the MNS Notification Template in Section 3.8.

3.9. MNS Notice Templates

Real-Time Market Suspension

The CAISO has suspended the Real-Time Market. Please follow your Day-Ahead schedules, unless otherwise instructed by CAISO System Operator through exceptional dispatches and/or Operating Instructions. The Real-Time Market is expected to be suspended through HH:MM.

Real-Time Market Resumption

The CAISO plans to resume the Real-Time Market at HH:MM. Until this time, please continue to follow your Day-Ahead schedules, unless otherwise instructed by CAISO System Operator through exceptional dispatches and/or Operating Instructions.

4. Supporting Information

Operationally Affected Parties

CAISO Public and posted on the WEM Portal.

References

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

CAISO Tariff	
CAISO Operating Procedures	2530 Manual Dispatch on Interties 2720 Market Disruption - Western Energy Imbalance Market (WEIM)
NERC Requirements	
WECC Criterion	
Other References	

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:

None.

Version History

Version	Change	Date
4.4	Section 3.1.1: Added note below RTPD/STUC Processing example. Section 3.1.2, Step 4: Updated to "If DA Awards are not sent..." Section 3.5, Step 3: Minor update for clarification. Sections 3.7 & 3.8: Updated to reflect that Generation Desk sends messages to market participants using MNS during suspension and resumption of Real-Time Market. Section 3.9: Replaced ISO Generation Desk with ISO System Operator and replaced operating orders with Operating Instructions. Other Minor format and grammar updates.	5/23/19

Version	Change	Date
5.0	Periodic Review: Section 1: Updated responsibilities and titles. Section 2: Added note referencing procedure 2720. Section 3: Updated to include information regarding Advisory Notes. Added RTMO actions. Section 4: Updated Operationally Affected Parties by removing the RC and added reference to Operating Procedure 2720 in References section. Replaced ISO with CAISO throughout. Updated review frequency to every three years. Minor edits for consistency, format and grammar updates and removed history prior to five years.	10/21/21
5.1	Updated all instances of EIM to WEIM and spelled out first instance. Removed history prior to five years.	2/16/23
5.2	Updated from Generation "Desk" to Generation "Dispatcher" and updated from Real-Time Market Operator (RTMO) Desk and RTMO to Market Operator. Updated from Shift Manager to Manager of Real-Time Operations.	9/11/23
5.3	Section 2.1: Updated 2nd sentence by replacing "Administrative Prices" with "market results".	2/01/24
5.4	Purpose section: Corrected reference of Real-Time Contingency Dispatch (RTCD) failure. Removed history prior to five years.	8/15/24
6.0	Periodic Review/Major Update: Removed the Real-Time Market Operator specifics, as these specifics will now be represented in Market Operator procedure 2720 (Official Market Disruption procedure Real-Time Market Operator operates from). Added new Section 2.3 for Market Participant Expectations. Included important Note for HASP failures in Sections 3.1.2 and 3.5. Included additional information about Market Suspension in Section 3.7. Updated from Director and Manager of Real-Time Operations to Director and Manager of Balancing Authority (BA) Operations. Updated instance of “FIT” with “ARMS” application. Updated Operationally Affected Parties to include “CAISO” Public and “posted on the WEIM Portal.” Minor formatting and grammar edits.	8/27/26

5. Periodic Review Procedure

Review Criteria & Incorporation of Changes

There are no specific criteria for reviewing or changing this document, follow instructions in CAISO Operating Procedure 5510.

Frequency

Every three (3) years.

Appendix

No references currently.