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		Version No.	5.3
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Generation Station Requirements and Communications		Distribution Restriction: None	

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## Purpose

Provides guidelines for Scheduling Coordinators (SC) and for Generating Resources.

## 1. Responsibilities

<b>Scheduling Coordinator (SC)</b>	Will recognize and abide by the authority of the CAISO as the Balancing Authority.
<b>Generating Resource</b>	A Generating Resource may include Generator Operators (a NERC Registered entity), a Generator Owner (GO) that should correlate with the CAISO Tariff defined entity Participating Generator Agreement (PGA).

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	<p>A Generating Resource shall communicate with the CAISO through its assigned SC, if applicable.</p> <p>If communication methods with the Scheduling Coordinator become unavailable, then the Generating Resource shall communicate directly with the CAISO Generation Dispatcher.</p>
<b>CAISO System Operator</b>	Will recognize the responsibility of the Generating Resource to operate in such a manner as to avoid injury to personnel and/or damage to facilities.

## 2. Scope/Applicability

### 2.1. Background


The California ISO (CAISO) has jurisdiction of all Scheduled or Bid Energy and Ancillary Services relating to the CAISO Balancing Area. Close coordination is required between Scheduling Coordinators (SCs), Generating Resources, Participating Resources, Participating Transmission Owners (PTOs), Utility Distribution Companies (UDCs), and the CAISO to assure prudent and reliable operation of the CAISO Balancing Area. If there is disagreement between the CAISO and the Generating Resources relative to the action most appropriate for the reliable operation of the CAISO Balancing Area or any sub-region thereof, and due to operating considerations there is insufficient time to reach concurrence, the CAISO will be the final authority. Inconsistent or otherwise questionable direction by the CAISO will be reviewed after the fact to improve coordination.

During an emergency (as declared by the CAISO), the CAISO jurisdiction is expanded to include all operations of the Generating Resources, which impact or may impact the CAISO Balancing Area and all Generating Units are subject to the instructions of the CAISO as Balancing Authority.

### 2.2. Scope/ Applicability

Includes expectations of the Generating Resource by the CAISO, responsible PTOs, and UDCs.

These operational expectations are especially useful during emergency operations, and during periods when communications are disrupted.

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### 3. Procedure Detail

#### 3.1. Reporting Requirements/ Communications

Take the following actions to coordinate the transfer of information:

It is essential that the CAISO and Generating Resources promptly inform one another of any circumstance that may adversely affect the operation or reliability of the CAISO Balancing Area, or the integrity or capability of the Generating Resource's facilities, including but not limited to the following:

- Power System Stabilizer (PSS) status
- Automatic Voltage Regulator (AVR) status
- Change of status
- Abnormal temperatures
- Storms
- Floods
- Earthquakes
- Equipment failures or malfunctions
- Deviations from the Registered Data or operating characteristics


#### Generating Resource, CAISO System Operator

1. **Inform** the other as promptly as possible of any incident or situation (including, but not limited to equipment outages affecting Generation, over-loads, over/under-voltages, or alarm indications) that, in the case of a Generating Resource, is reasonably likely to threaten any of the following:
  - The capability of the Generating Unit and facilities
  - The reliability of the CAISO Balancing Area
  - Schedules
  - Bids of Energy and/or Ancillary Services
2. **Notify** the applicable PTO and the CAISO as soon as practical, but no later than 30 minutes of a change to the status of automatic voltage regulators (AVRs) or power system stabilizers (PSSs).

#### CAISO System Operator

1. **Communicate** either through the SC or directly with the Generating Station Control Room, as described in [Section 3.3](#) of this procedure.
2. **When** notified of the loss of an automatic Voltage Regulator Control (AVR), and the SC has not notified the PTO,
  - **Notify** the applicable PTO of the status of the device (the TOP will direct the Generating Resource to maintain or change either its Voltage Schedule or its Reactive Power Schedule, as appropriate).

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Take the following actions to communicate promptly any changes in the Generating Unit Operating Limit (i.e., per unit) to the CAISO:


<b>Scheduling Coordinator (SC)</b>
<ol style="list-style-type: none"> <li>1. <b>Refer</b> to CAISO Operating Procedure <a href="#">3220 Generation Outages</a> for guidance on reporting Outages and de-rates.</li> <li>2. <b>Include</b> the full available Capacity as the Operating Limit of the Unit being scheduled; in all Schedules (This does not reflect the sum of all of the Energy and Ancillary Service Schedules).   <i>Example: A Unit capable of regulating up to 480 MW may have a current Energy Schedule of 250 MW and an upper regulating Ancillary Service Schedule of 100 MW; the Operating Limit to be included on these Schedules is to be 480 MW (i.e., not 350 MW, which is the sum of accepted Schedules).</i> </li> <li>3. If a Unit is equipped with digital input or other (e.g., “thumb-wheel setters”) types of input devices used to transmit Operating Limits, <ul style="list-style-type: none"> <li>• <b>Set</b> the values to indicate the full Automatic Generation Control (AGC) capability of the Unit within its operating range (High or Low), rather than the value of the existing Schedules.</li> </ul> <p><i>Note: Settlement payments for Ancillary Services may be affected by incorrect communication of Operating Limits included within the Schedules submitted or by indication from setters.</i></p> </li> <li>4. If the Unit is restricted in its maximum output due to equipment out of service or other reasons, <ul style="list-style-type: none"> <li>• <b>Verify</b> the communicated Operating Limit is reflective of this restriction.</li> </ul> </li> </ol>

### 3.2. Voice Communication with Generating Unit Control Room Operator

Take the following actions under one of the following reasons, should CAISO not feasibly be able to communicate with the Scheduling Coordinator:

<b>CAISO System Operator</b>
<ol style="list-style-type: none"> <li>1. If there is an emergency, or system integrity is threatened and there is insufficient time to communicate with a Generating Unit through the SC, or it is apparent that communications to an SC is not being conveyed to the Generating Unit in a timely manner, <ul style="list-style-type: none"> <li>• <b>Communicate directly</b> with the Generating Unit Control Room Operator.</li> </ul> </li> <li>2. If communications between the CAISO and a generating station is unavailable, <ul style="list-style-type: none"> <li>• <b>Relay communications</b> through the appropriate PTO Control Center, as available.</li> </ul> </li> </ol>

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Generating Resource
<ol style="list-style-type: none"> <li>1. <b>Ensure</b> only qualified and authorized control room operations personnel are involved in direct communication with the CAISO during emergency communications.</li> <li>2. If the SC or Generating Resource is unable to contact the CAISO after ten minutes of continuous attempts, <ul style="list-style-type: none"> <li>• <b>Contact</b> the responsible PTO Control Center <u>and</u> <b>ask</b> to be “transferred” to the CAISO.</li> <li>• If a “transfer” is infeasible, <ul style="list-style-type: none"> <li>○ <b>Remain</b> in contact with the PTO Control Center for directions (either “relayed” from the CAISO, or directly from the PTO if the CAISO communication is not available).</li> </ul> </li> </ul> </li> <li>3. <b>Continue</b> attempts to contact the CAISO.</li> <li>4. If direct communications between the CAISO and the Generating Resource Operator has occurred, <ul style="list-style-type: none"> <li>• <b>Advise</b> the SC of the content, nature, and time of the communications.</li> </ul> </li> </ol>

CAISO System Operator
<ol style="list-style-type: none"> <li>1. <b>Conduct</b> periodic communication tests, as desired, with the generator control room operator to assure the viability of communication circuits and to maintain familiarity with direct CAISO control room operator communications.</li> </ol>

### 3.3. Normal Operations

Take the following actions to maintain generating station requirements under normal operating conditions:

Scheduling Coordinator (SC), Generating Resource
<ol style="list-style-type: none"> <li>1. <b>Maintain</b> the capability for constant communication with the CAISO.</li> <li>2. <b>Adhere</b> to all Schedules.</li> <li>3. <b>Maintain</b> normal frequency and voltage.</li> <li>4. <b>Maintain</b> capability of providing immediate response to abnormal frequency.</li> <li>5. <b>Set</b> governors to provide a five percent droop characteristic and to remain fully responsive to frequency excursions greater than 0.036 Hz.</li> <li>6. <b>Set</b> load limit devices (i.e., Unit/governor blocks) at a point to enable a full available load (i.e., without substantial operator intervention) of each Unit to allow for maximum governor action upon the occurrence of low frequency.</li> <li>7. <b>Maintain</b> Automatic Voltage Regulators and Power System Stabilizers in service.</li> </ol>

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### 3.4. Emergency Operations – Low Frequency

Take the following actions for notification during low frequency event:

<b>Generating Resource</b>
<ol style="list-style-type: none"> <li>1. <b>Inform</b> the respective SC of any frequency excursion.</li> <li>2. <b>Follow</b> dispatch instructions, as provided.</li> </ol>

<b>Scheduling Coordinator (SC)</b>
<ol style="list-style-type: none"> <li>1. <b>Contact</b> the CAISO Generation Dispatcher to <b>determine</b> if a change in Schedules and/or services will be required.</li> </ol>

<b>Generating Resource</b>
<ol style="list-style-type: none"> <li>1. If the Unit was on AGC <u>prior to</u> the frequency excursion, <ul style="list-style-type: none"> <li>• <b>Return</b> to AGC.</li> </ul> </li> <li>2. If unable to reset AGC (due to low frequency or other problem), <ul style="list-style-type: none"> <li>• <b>Raise</b> load until Unit AGC will reset or until Unit reaches full available load without exceeding 60.0 Hz.</li> </ul> </li> <li>3. If the frequency decays further to 57.0 Hz, with <u>no</u> immediate recovery, <ul style="list-style-type: none"> <li>• <b>Separate</b> the Unit(s) from the system <u>and</u>, if feasible, <b>attempt to carry</b> auxiliary Load.</li> </ul> </li> <li>4. <b>Prepare</b> to restart the Unit(s) <u>and/or</u> <b>prepare</b> to resynchronize to the system.</li> <li>5. <b>Contact</b> the CAISO Generation Dispatcher to <b>provide</b> start-up power requirements (if any) and for further instructions.</li> <li>6. <b>Refer</b> to CAISO Operating Procedure <a href="#">4510 Load Management Programs and Underfrequency Load Shedding</a>.</li> </ol>


### 3.5. Electric Grid Shutdown

Take the following actions if a total or partial electric grid shutdown occurs, as evidenced by zero voltage on the facilities interconnecting with the CAISO Balancing Area:

<b>Generating Resource</b>
<ol style="list-style-type: none"> <li>1. <b>Advise</b> the respective SC of this zero voltage condition.</li> </ol>

<b>Scheduling Coordinator (SC)</b>
<ol style="list-style-type: none"> <li>1. If the Generator has reported experiencing zero voltage at its interconnection, <ul style="list-style-type: none"> <li>• <b>Advise</b> the Generating Unit to make contact as previously detailed in <a href="#">Section 3.3</a>.</li> </ul> </li> </ol>

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<b>Generating Resource</b>
<ol style="list-style-type: none"> <li>1. If communication cannot be established with the respective SC, <ul style="list-style-type: none"> <li>• <b>Contact</b> the CAISO Generation Dispatcher directly.</li> </ul> </li> <li>2. If unable to contact the CAISO, <ul style="list-style-type: none"> <li>• <b>Proceed</b> as previously detailed in Section 3.3.</li> </ul> </li> <li>3. <b>Prepare</b> for Start-Up, <u>and</u> <b>initiate</b> a Start-Up, as soon as auxiliary power requirements can be met.</li> </ol>

<b>Black Start Resource Owner, Generating Resource</b>
<ol style="list-style-type: none"> <li>1. <b>Start</b> all Black Start capable Generating Units <u>and</u></li> <li>2. <b>Supply</b> auxiliary power to the other Generating Units at the same Generating site.</li> </ol>

<b>CAISO System Operator</b>
<ol style="list-style-type: none"> <li>1. <b>Refer</b> to CAISO Operating Procedure <a href="#">4610 System Restoration</a> (not available for public distribution).</li> <li>2. <b>Direct</b> (as necessary) Generating Units with Black Start capability to be <b>started</b> to supply Start-Up power at other stations, or for Nuclear Generating Unit reactor safety (see CAISO Operating Procedure <a href="#">3350 Offsite Power Requirements and Restoration for Nuclear Power Plants</a>).</li> </ol>

## 4. Supporting Information

### Operationally Affected Parties

Shared with the 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:

CAISO Tariff	
CAISO Operating Procedure	<a href="#">3220 Generation Outages</a> <a href="#">3350 Nuclear Plant Interface Coordination</a> <a href="#">4510 Load Management Programs and Underfrequency Load Shedding</a>

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NERC Requirements	
Other References	CAISO Technical Standard - Monitoring and Communications Requirements for Generating Units Providing Only Energy and Supplemental Energy.  Participating Generator Agreement  PGAE Dispatching Instructions  SDG&E Standard Operating Procedures  SCE System Standard Operating Procedures

## 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:


<b>Automatic Generation Control (AGC)</b>	An SC that allows the CAISO to remotely control their Generating Stations within a specified range of operation.
<b>Black Start Generating Unit</b>	Generating Unit that is capable of self-starting without a source of off-site electricity.
<b>Quick-Start Generating Unit</b>	Generating Unit that (taking into account personnel and fuel availability, etc.) can be started (locally or remotely), synchronized to the system, and available for loading in ten minutes or less.
<b>Reactive Power</b>	Generation or other equipment needed to maintain acceptable voltage levels on the CAISO Controlled Grid, and to meet reactive Capacity requirements at points of interconnection on the CAISO Controlled Grid.

## Version History

Version	Change	Date
4.3	Removed reference of 5310A from Appendix section, as it was retired on 12/21/18. Removed Peak RC from Operationally Affected Parties. Format and grammar updates.	10/24/19

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Version	Change	Date
5.0	Periodic review <ul style="list-style-type: none"> <li>Updated Purpose and Responsible parties with GOP replacing PG throughout. This is to be consistent with OP 5110 using the NERC definition versus tariff name.</li> <li>Removed Step 8 from 3.3.</li> <li>Removed reference for PG to contact other ISO control room with new phone system this doesn't apply.</li> <li>Updated Link in 3.1 to link Generation Outages 3220.</li> <li>Minor format and grammar updates.</li> </ul>	8/28/20
5.1	Replaced Generator Operator and GOP with Generating Resources throughout. Removed actions required of Generating resources in low frequency event (Section 3.4). Updated all references of "ISO" to "CAISO." Minor format and grammar updates.	12/17/20
5.2	Periodic Review: Updated from Generation "Desk" to "Dispatcher". Updated from Blackstart to Black Start for procedures consistency. Removed history prior to five years.	12/11/23
5.3	References: Removed WECC Criterion and VAR-002 reference, as it is no longer applicable. Removed history prior to five years, minor formatting and grammar edits.	12/05/24

## 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 at this time.

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