

NEW RESOURCE IMPLEMENTATION FORUM





Grid Operations Role with NRI

May 2024

Welcome

Our presentation will begin shortly.

Today's Presenter: Chris Bossard – Grid Operations Manager, Real Time Operations

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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

Objectives

Discuss the role of Operations as a Balancing Authority.

Identify the role and process after Sync Approval in the NRI.

Discuss Unit Testing and expectations prior to COD.

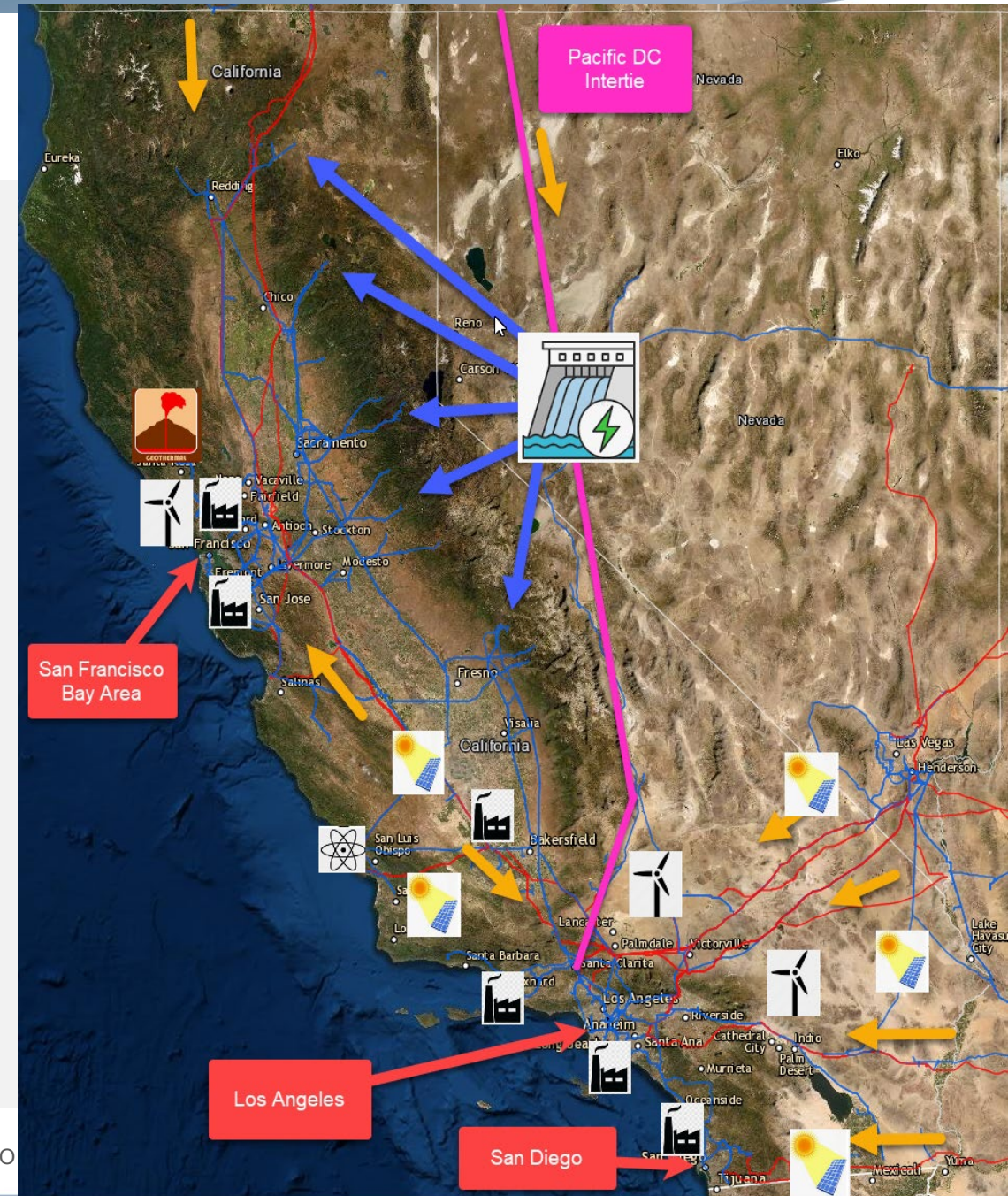
CAISO Balancing Authority

- Maintains reliability on the grid
- Manages the flow of energy
- Oversees the transmission planning process
- Operates the wholesale electricity market



Overview of CAISO's Grid

- 3 Major Load Centers and Investor Owned Utilities (IOU's)
 - Pacific Gas & Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E).
- Hydro power from the eastern mountain range (Sierra Nevada)
- 1 nuclear power plant (current retirement in 2030)
- DC Intertie (PDCI) from the Pacific Northwest's hydro power (3,100 MW)
- World's largest geothermal system ("The Geysers") 835 MW
- Natural gas fleet largely near the load centers
- Solar and Wind in less populated inland areas



Historical statistics and records (as of 9/9/2026)

PEAK DEMAND

52,061 MW

Sept. 6, 2022 at 4:57 p.m.

Second highest:

50,270 MW, July 24, 2006

New record

SOLAR PEAK

23,896 MW

Aug. 19, 2026 at 12:04 p.m.

Previous record:

23,367 MW, Aug. 3, 2026

WIND PEAK

8,312 MW

May 15, 2026 at 1:41 a.m.

Previous record:

7,748 MW, May 4, 2026

PEAK NET IMPORTS

11,894 MW

Sept. 21, 2019 at 6:53 p.m.

STEEPEST 3-HOUR AVERAGE RAMP

24,567 MW

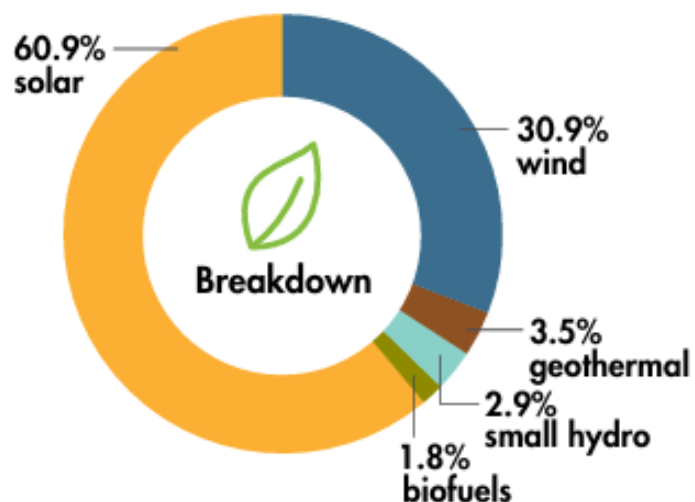
Mar. 16, 2026 starting at 3:50 p.m.

Second highest:

24,378 MW, Oct. 5, 2025

KEY STATISTICS

Installed renewable resources (as of 9/10/2026)



Megawatts	
 Solar	24,270
 Wind	12,326
 Geothermal	1,410
 Small hydro	1,140
 Biofuels	722
TOTAL	39,869

[See Today's Outlook](#)

NOTE — The ISO is using updated methodology to generate data. Only fully commercial units are now counted; units that are in test mode or partially online are excluded. For that data, view the Master Control Area Generating Capability List in the Master Generating File on OASIS under "Atlas Reference."

Role of the CAISO Generation Dispatcher

Mitigation

Manage and mitigate within System Limits

- ~26,000 circuit miles of transmission

Balancing

Manage Supply to meet Real-Time Demand

- Serve ~80% of California demand

Communication



- CAISO Transmission (TOP) to Utilities [Participating Transmission Owners (PTOs)]
- Scheduling Coordinators to Resources (GO/GOPs)

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- Reliability Coordinator (RC)

Grid Operations Role with New Resource Implementation (NRI)

- After Sync Prerequisites are met:
 - Approval must be given prior to Resource Testing
 - Scheduling Coordinator (SC) actions:
 - CAISO Operating Procedure 5320
 - Submit an outage type NEW_GENERATOR_TEST_ENERGY.
 - » Resource availability to 0 MW, from the time of the initial sync until the assumed COD.
 - » Provide information from NRI Test Energy Template.
 - » Provide a test schedule for the resource.
 - » Communicate any changes to the test schedule prior to test date.

Test Schedule Review in Real-Time Horizon

- D+2 and D+1 Generation Work Review Process
 - Generation Dispatcher will review the submitted work in addition to the NEW_GENERATOR_TEST_ENERGY type for test schedule plans.
 - Listed in either the Short Description or External Notes section of the outage card.
 - If it's not present, then CAISO will contact Scheduling Coordinator (SC) to discuss updating outage information.
 - If such test plans are not present, then testing will not proceed or be approved until provided.



Outage View

Outage ID: 15107557

FAR

Resource Name: [REDACTED] Resource Type: NGRL PMAX: 230.00 Start: 02/02/2024 08:00 End: 04/01/2024 00:00 Emergency Return: Duration [v] Linked Outages: [v] Modify

Participant: [REDACTED] Participant Outage ID: [REDACTED] Nature of Work: NEW_GENERATOR_TEST_EN

Availability Date/Time	OOS	NDC	PMAX	Availability MW	Curtailment MW
02/02/2024 08:00	☐	☐	230.00	0.00	230.00
04/01/2024 00:00	☐	☐	230.00	230.00	0.00

Short Description: Power Plant Address - [REDACTED] Power Plant Control Room Phone Number - [REDACTED] Scheduling Coordinator ID - [REDACTED] Scheduling Coordinator Contact Phone Number - [REDACTED] Resource ID - [REDACTED] Resource Name - [REDACTED] PTO/Transmission Operator - SCE POD Description? Type Of Generator - BESS Resource Capacity - PMax 230 MW

Short Description: includes all NRI Energy Template information in addition to a complete test schedule.

External Notes: includes complete test schedule for desired testing days

Availability at 0MW which shows market not available for dispatch

MODIFY APPROVE IN OK

External Notes

Date	Day	HE	Peak	Output	MW	Avg	Output	MW	STATE
3/10/2024	Sunday	1	0	0					IDLE
3/10/2024	Sunday	2	0	0					IDLE
3/10/2024	Sunday	3	0	0					IDLE
3/10/2024	Sunday	4	0	0					IDLE
3/10/2024	Sunday	5	0	0					IDLE
3/10/2024	Sunday	6	-175	-175					CHARGE
3/10/2024	Sunday	7	-175	-175					CHARGE
3/10/2024	Sunday	8	-175	-175					CHARGE
3/10/2024	Sunday	9	-175	-175					CHARGE
3/10/2024	Sunday	10	-175	-175					CHARGE
3/10/2024	Sunday	11	-175	-175					CHARGE
3/10/2024	Sunday	12	-175	-175					CHARGE
3/10/2024	Sunday	13	-175	-175					CHARGE
3/10/2024	Sunday	14	0	0					IDLE
3/10/2024	Sunday	15	0	0					IDLE
3/10/2024	Sunday	16	0	0					IDLE
3/10/2024	Sunday	17	0	0					IDLE
3/10/2024	Sunday	18	180	180					DISCHARGE
3/10/2024	Sunday	19	180	180					DISCHARGE
3/10/2024	Sunday	20	180	180					DISCHARGE
3/10/2024	Sunday	21	180	180					DISCHARGE
3/10/2024	Sunday	22	90	90					DISCHARGE
3/10/2024	Sunday	23	0	0					IDLE
3/10/2024	Sunday	24	0	0					IDLE
3/11/2024	Monday	1	0	0					IDLE
3/11/2024	Monday	2	0	0					IDLE
3/11/2024	Monday	3	0	0					IDLE
3/11/2024	Monday	4	0	0					IDLE
3/11/2024	Monday	5	0	0					IDLE
3/11/2024	Monday	6	-175	-175					CHARGE
3/11/2024	Monday	7	-175	-175					CHARGE
3/11/2024	Monday	8	-175	-175					CHARGE
3/11/2024	Monday	9	-175	-175					CHARGE
3/11/2024	Monday	10	-175	-175					CHARGE
3/11/2024	Monday	11	-175	-175					CHARGE
3/11/2024	Monday	12	-175	-175					CHARGE
3/11/2024	Monday	13	-175	-175					CHARGE
3/11/2024	Monday	14	-175	-175					CHARGE
3/11/2024	Monday	15	-175	-175					CHARGE

Planned Start Date/Time: 02/02/2024 08:00 Planned End Date/Time: 04/01/2024 00:00 Outage Duration: 58 day(s) 15 hour(s) 0 minute(s) Actual Start Date/Time: 02/02/2024 08:00 Actual End Date/Time: [REDACTED] Discovery Date/Time: 01/23/2024 11:00 BA/TOP Confirmed: ☒ Emergency: ☐ Operational: ☐ Black Start: ☐ RC Priority Date/Time: [REDACTED] Priority Date/Time: 01/23/2024 11:03 SCP Exempt: ☐ Outage State Reason: OTHER Opportunity: [v] GADS Cause Codes: [REDACTED] Version: 48 RAS/SPS Out of Service: ☐ Y ☐ N ☒ N/A RAS/SPS Reduced Redundancy: ☐ Y ☐ N ☒ N/A Protection Zone: ☐ Y ☐ N ☒ N/A EMS/ICCP Outage: ☐ Y ☐ N ☒ N/A

External Notes:

Internal Notes:

ISO Operator Notes:

Outage Card Example (CAISO View)

Additional Test Card Considerations from CAISO Operations

- Test schedule should be entered into “**NOTES**” tab in the External Notes section.
- In the test schedule, Avg Output or Cumulative day total is not needed. This information is not used and can cause confusion.
- **Verbal notification** is required for **any changes to scope** of the test in addition to updating the OMS card.
- Notification and schedule information is needed for **MVAR testing** in the card. All MVAR testing must be coordinated with the local **Transmission Operator (TO)**.

Additional Test Card Considerations from CAISO Operations (cont)

- Test schedules should include details (min-max testing, ramp rates/times, hold times).

Examples

Time | Min / Max MW | Ramp Rate (MW/Min) | Min/Max MVAR | MISC NOTES

- 07:00 – 09:30 | -150MW / 0MW | 30MW/Min | 0 / 0 MVAR
- 09:30 – 10:00 | 0MW / 0 MW | 0MW/Min | 0 / 0 MVAR
- 10:00 – 12:00 | 0MW / 200MW | 40MW/Min | 0 / 0 MVAR

IF resources is going to have variable output for duration then:

Time | Min / Max MW | Ramp Rate (MW/Min) | Min/Max MVAR | MISC NOTES

- 07:00 – 09:30 | -150MW / 25 MW | 30MW/Min | 0 / 0 MVAR | Ramp to -150MW, hold 10 minutes, then ramp to +25MW and hold 10 minutes. Repeat for duration.

Pre-Commercial (Pre-COD) Resource Testing



- **Communications**

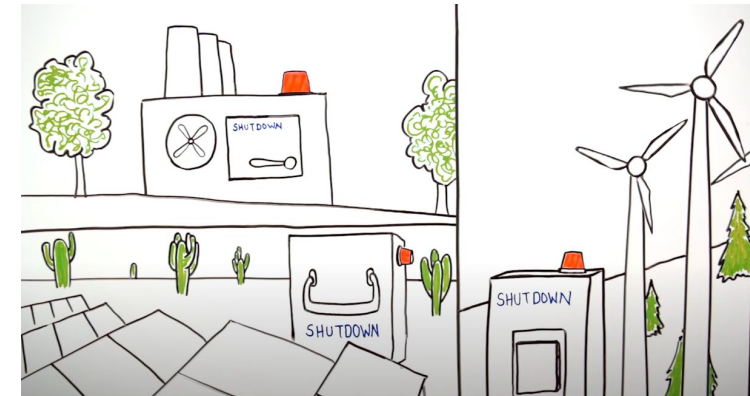
- Scheduling Coordinator (SC) must have good communications with CAISO and the resource (GOP) during testing.
- Coordinate any changes to the approved test plan with CAISO.

- **Telemetry**

- CAISO must have good quality data from the resource during testing or testing will be denied, rescheduled, or terminated.
- Control of Resource (***Must have control of resource(s) at all times***)
- Ramping should always be across 5 minutes.

Overall Expectations for Communications and Performance

- **Communications for Reliability**
 - The CAISO will not approve testing unless based on studies, there is sufficient transmission capacity is available to support test schedule.
- **Performance for Reliability**
 - If resource is causing a reliability situation on the Grid, then an Operating Instruction may be issued from CAISO to come offline within 10 minutes until further notice.
 - ***Must have control of resource(s) at all times***



Overall Expectations for Communications and Performance

- **Performance for Reliability**
 - CAISO Generation Dispatcher will report Operating Instruction and if Operating Instruction is not followed then:
 - CAISO will issue the following:
 - an official letter stating importance of reliability and adhering to regulatory standards.
 - a hold on testing.
 - a hold on pre-COD progress (RIMS process).
 - a requirement to complete training.
 - Once required training is completed, CAISO will provide an approval to proceed with testing and NRI will release RIMS hold.

Expectations for Commercial (COD) Resources

- **Performance for Reliability**
 - Ability to follow DOTs (Five-minute Dispatch Operating Targets)
 - Ramp to follow AGC DOPs (Dispatch Operating Points)
 - Not exceed DOT when Follow DOT and Operating Instruction (OI) flags are “Y” in ADS (Automated Dispatch Instruction).
 - Be able to follow manual instructions without the need to have a DOT/instruction be sent through ADS.
- Ancillary Services (A/S) Certified Resources to provide Regulation
 - Ability to ramp on and off Automatic Generation Control (AGC) to DOP.
 - AGC awards and connectivity

To Recap:

- Ensure proper set up and communication for resource testing and performance
- Communicate to ensure adequate control of resources
 - Operating Instructions
 - Respond to Operating Instructions within required time parameters
- Send in proper updates for resource testing and availability
- Actively monitor your resource
 - Who is running the resource? Who has control? If needed, can I take the site offline within 10 minutes.

Share information with your [Resource Operators]!



Wrap Up

Summary, Q&A



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.

For resource specific questions or concerns, please submit a CIDI ticket.