# Resource Performance Expectations - Summer Readiness Refresher 2025 Training

Prepare for increased electricity demand during the summer season and focus on emergency response, communication, and operational coordination

Slides and recording will both be available on caiso.com

# Agenda

- Lessons learned from summer 2024
- Operational actions associated with unit response to Dispatch Operating Targets (DOTs), Dispatch Operating Points (DOPs) and Operating Instructions, including batteries
- Outage management, including batteries
- Emergency assistance protocols and communications
- Where to find additional information

## Participate

Add questions and comments in the Chat

Raise hands in WebEx to ask questions

Please stay muted until asking questions

# LESSONS LEARNED FROM 2024

# 2024 Statistics

**Peak demand**

**48,323 MW**

Sept 5 at 4:59 p.m.

**Previous year:**
44,534 MW on Aug 16 at 5:59 p.m.

Based on 1-minute averages, and includes dynamic transfers.

New record

**Peak demand served by renewables**

**20,612 MW (51.8%)**

Aug12 at 5:03 p.m.

**Previous year:**
15,524 MW (38.2%) on July 18 at 5:57 p.m.

This indicates the highest amount of renewables serving peak electricity demand on any given day.


New record

**Solar peak**

**19,650 MW**

Aug 23 at 12:10 p.m.

**Previous year:**
16,056 MW on Sept 26 at 11:32 a.m.

**Wind peak**

**6,322 MW**

May 15 at 10 p.m.

**Previous year:**
6,317 MW on May 28 at 5:39 p.m.

**Peak net imports**

**9,566 MW**

July 3 at 2:52 a.m.

**Previous year:**
10,480 MW on May 20 at 11:36 p.m.

**Added installed storage capacity**

**4,190 MW**

**Previous year:**
2,684 MW

**Total installed storage capacity:**
11,454 MW

**Western Energy Imbalance Market (WEIM)**

**Gross benefits:**

**$1.57 billion**

**Previous year:**
$1.65 billion

**Total gross benefits:**
$6.62 billion

*Visit WEIM*

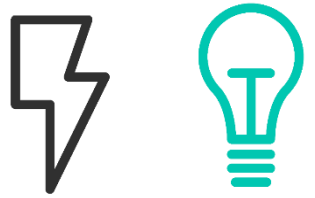
**WEIM ISO GHG savings:**

**117,466 $mTCO_2$**

**Previous year:**
133,507 $mTCO_2$

**Total WEIM ISO GHG savings:**
1,043,034 $mTCO_2$

*See ISO GHG emissions tracking reports*



| | |
|---|---|
| **1 MW** | **900 homes** |
| **100 MW** | **90,000 homes** |
| **20,000 MW** | **18,000,000 homes** |
| **48,000 MW** | **43,200,000 homes** |

# Prepare for summer operations

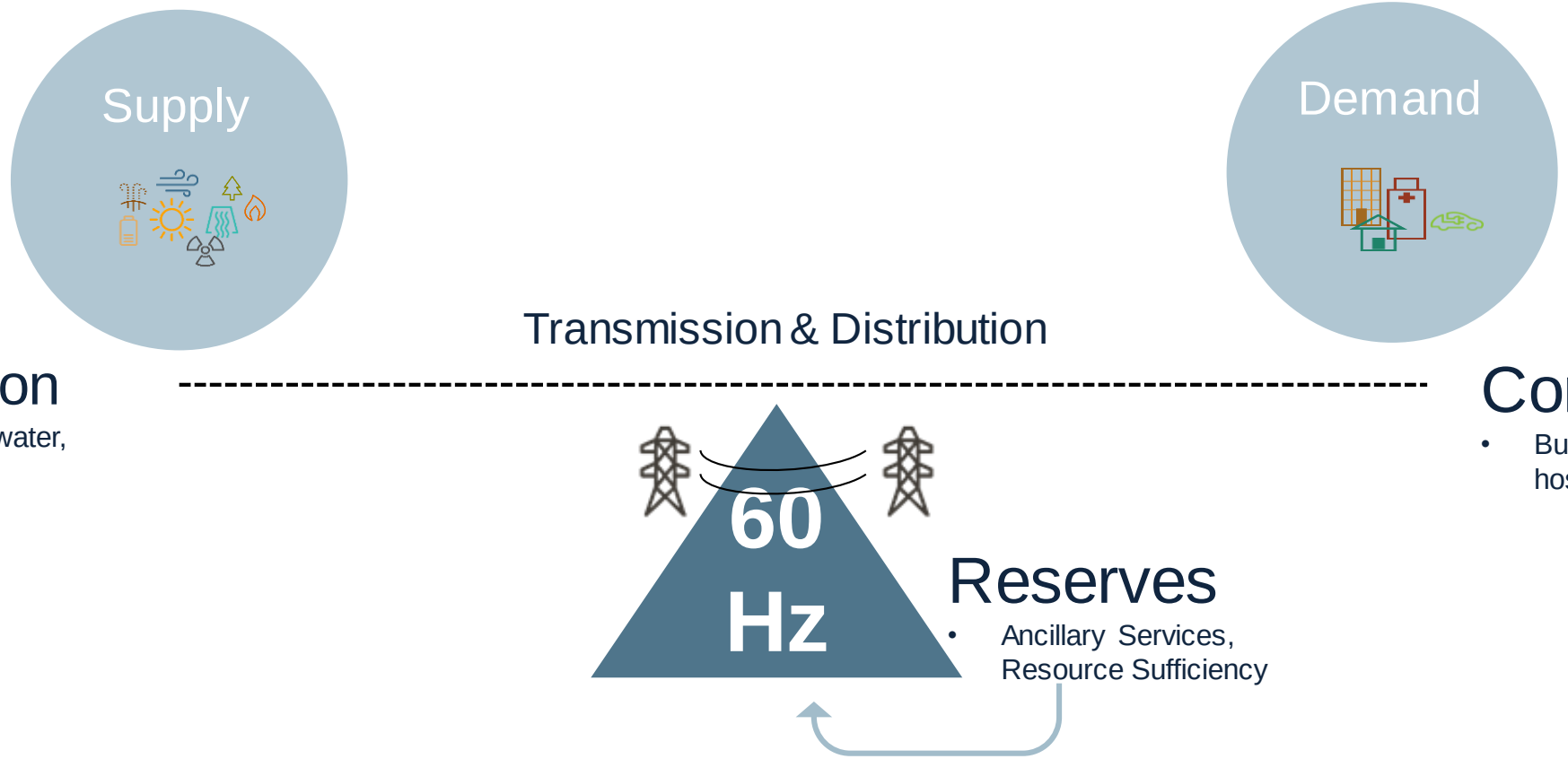
Summer Loads and Resources Assessment evaluates expected 2025 summer supply and demand conditions for the California Independent System Operator (ISO) balancing authority area (BAA)

This document indicates continued improvement in resource availability for the upcoming summer driven by accelerated resource development

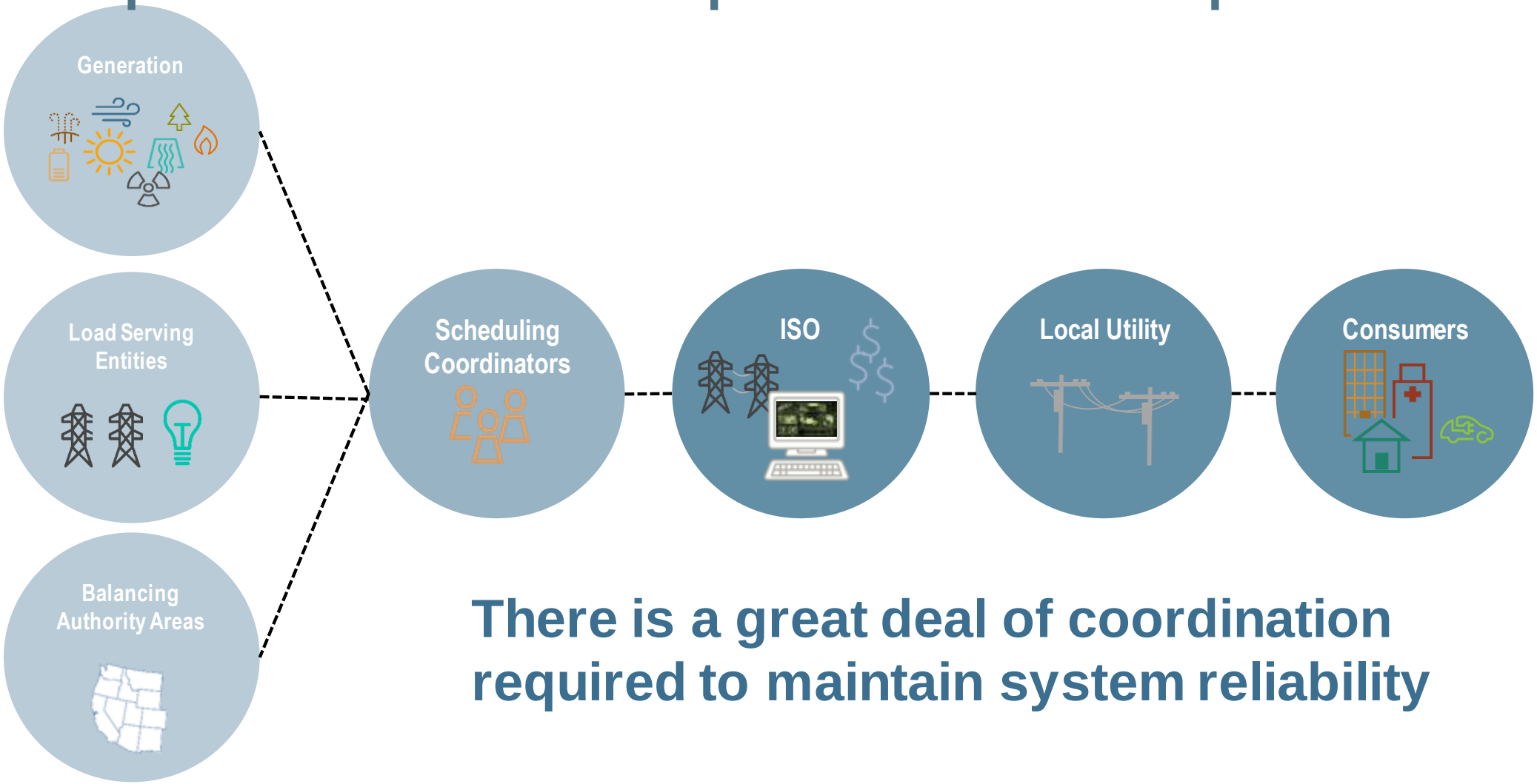
# OPERATIONAL ACTIONS ASSOCIATED WITH UNIT RESPONSE AND PERFORMANCE

# System Reliability

**System reliability requires a constant and instantaneous match between supply and demand**

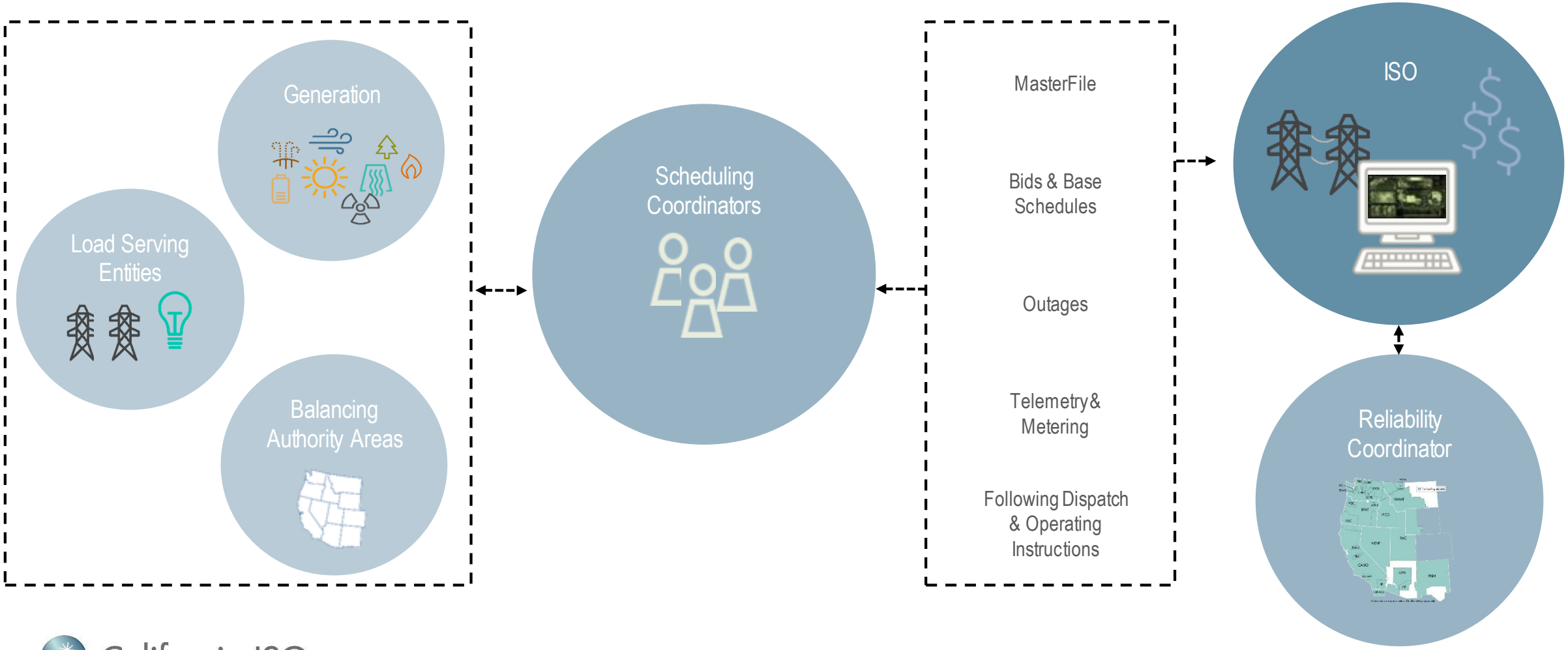


# Participation with the ISO depends on services provided




**There is a great deal of coordination required to maintain system reliability**

# Communication + Coordination = Reliability



# Three part conversation pursuant to NERC COM-002

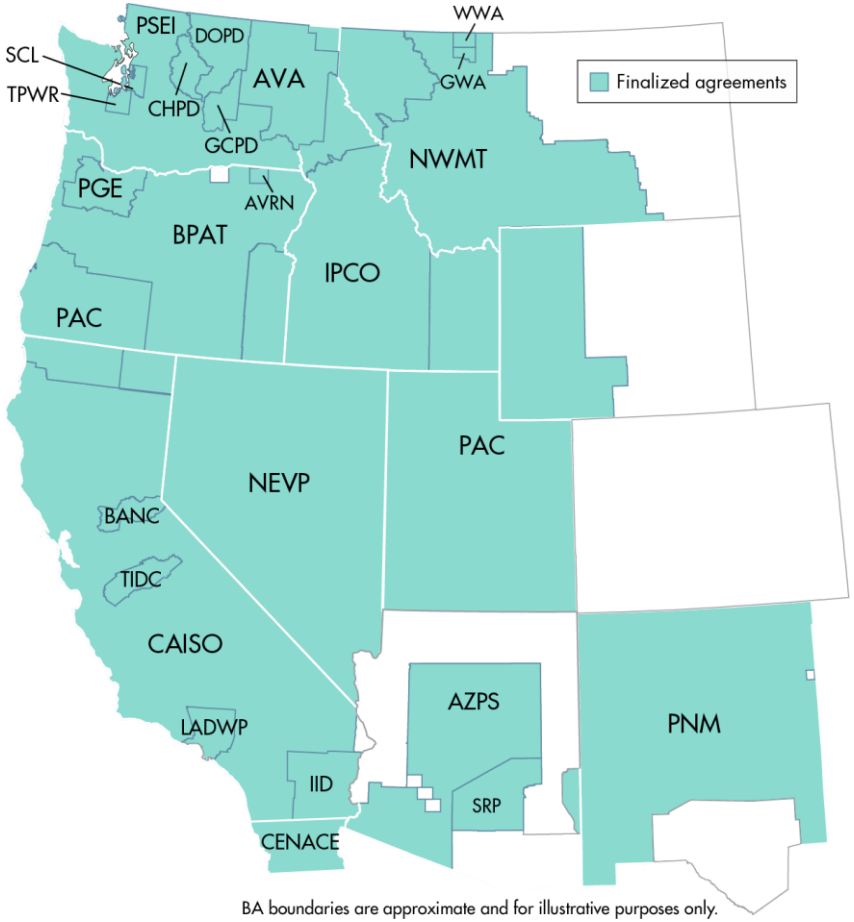
This is the ISO Generation Dispatcher and I need for you to take Unit ABC_123 offline within the next 10 minutes.

This is the Resource Operator and I understand you are instructing me to take Unit ABC_123 offline within the next 10 minutes.

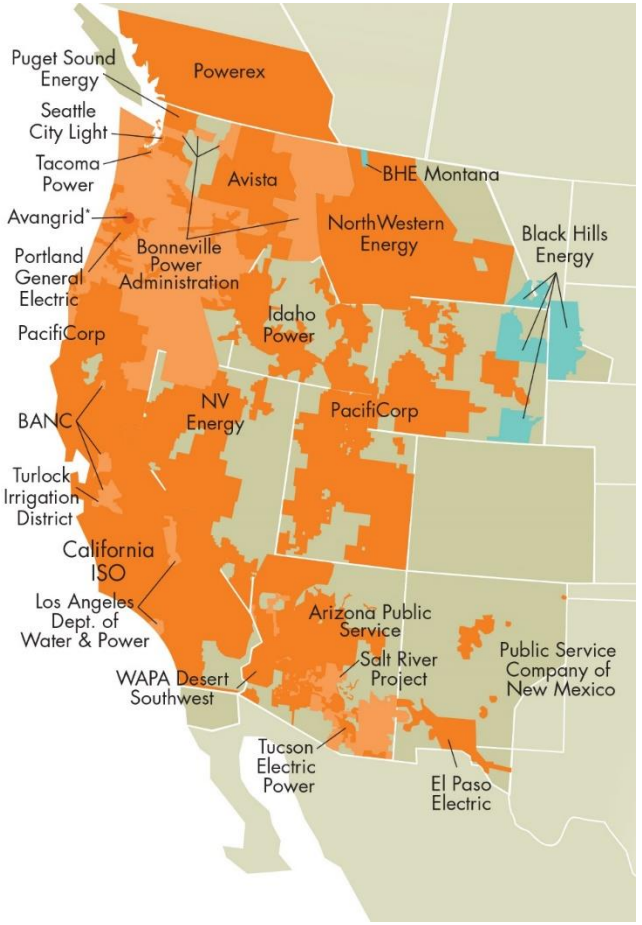
That is correct.
Thank you.

# ISO Market and Reliability Footprints


**ISO BAA / EDAM**

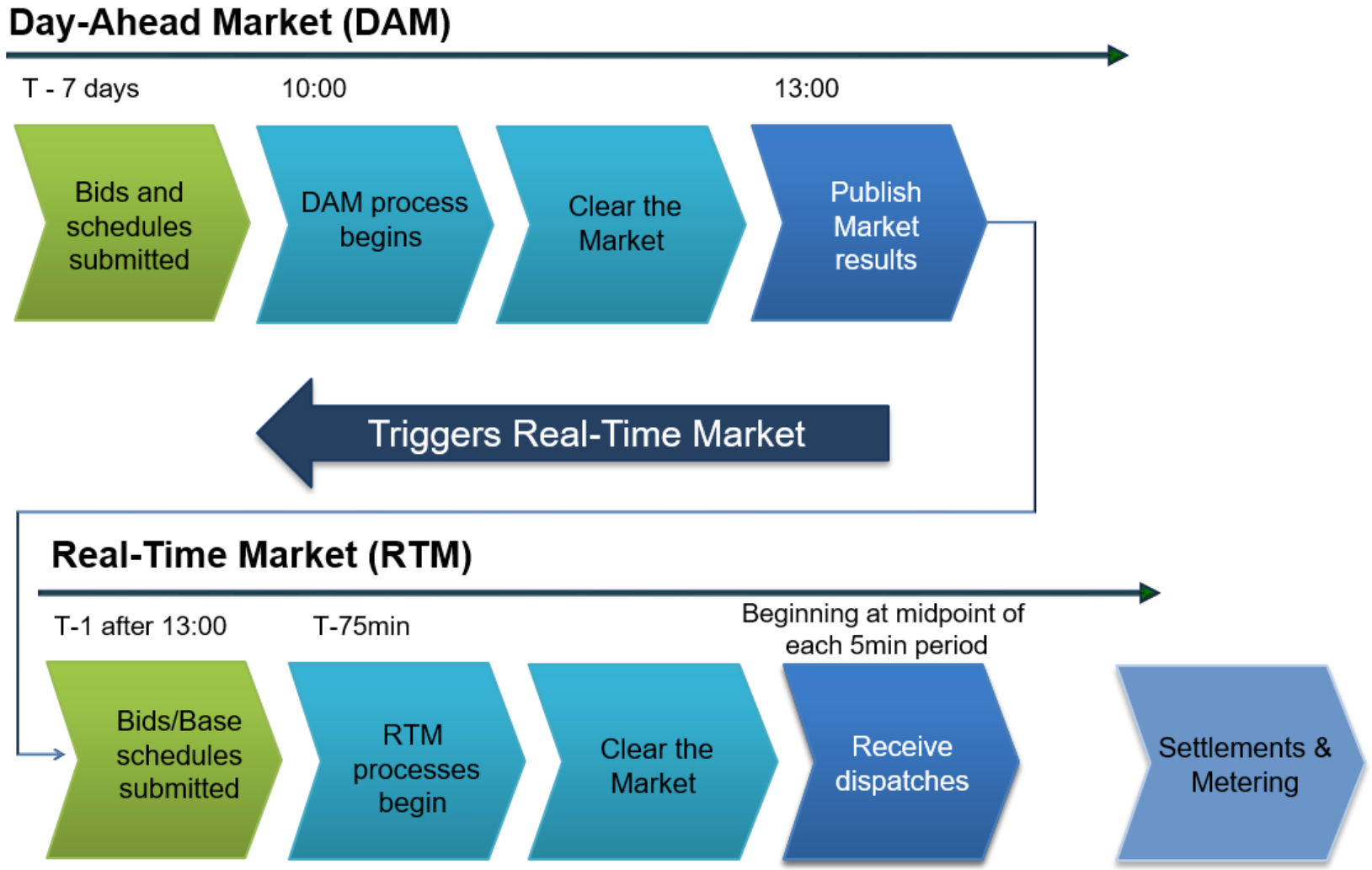



**RC West**




**WEIM**

# Market process timelines



# Market optimization

## Security Constrained Unit Commitment (SCUC)

Used in the **Day-Ahead** timeframe

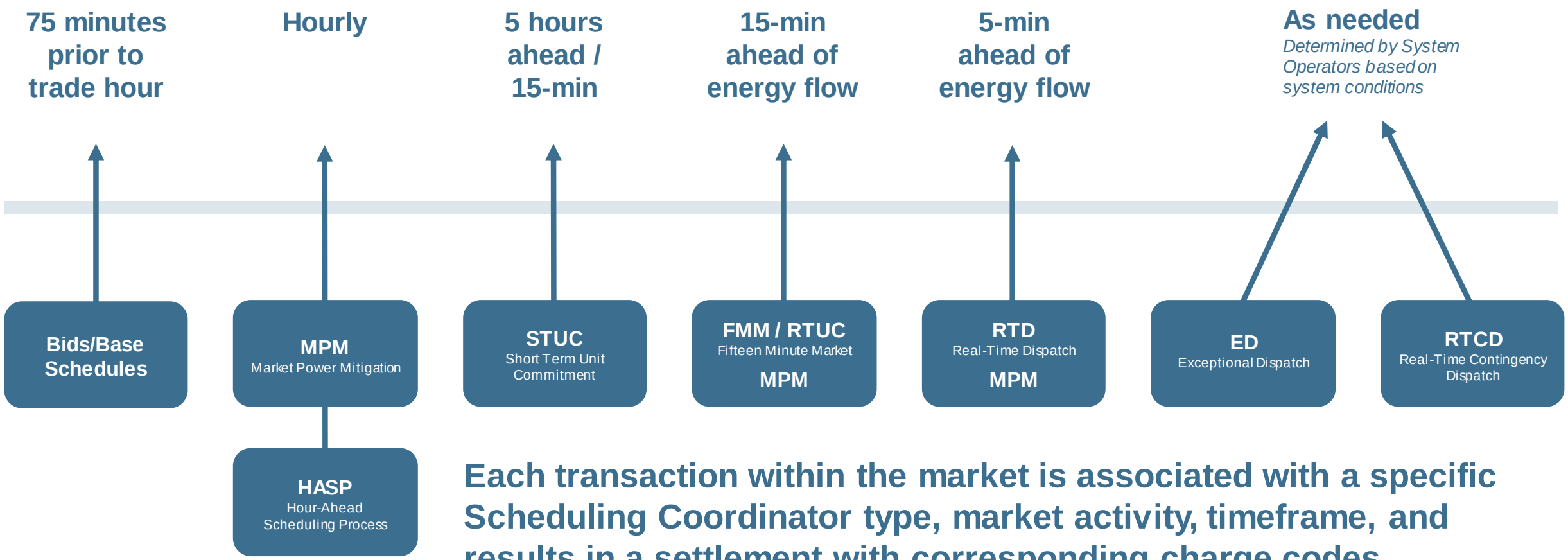
- Minimize start-up time
- Minimize load costs, bid in energy costs and ancillary services costs
- Subject to network and resource-related constraints over the entire time horizon

## Security Constrained Economic Dispatch (SCED)

Used in the **Real-time** timeframe

- Reduce cost of serving demand
- Resolve transmission constraints economically
- Provide transparency on constraints and costs

# Real-time milestones




**Each transaction within the market is associated with a specific Scheduling Coordinator type, market activity, timeframe, and results in a settlement with corresponding charge codes**

# Contingency dispatch

## Real-time Contingency Dispatch (RTCD)

- Real-time contingency dispatch (RTCD) dispatches energy to respond to a grid disturbance or a system emergency such that waiting until the next normal real-time economic dispatch (RTED) run is not adequate
- Produces a 10-minute dispatch
- Dispatch instructions override previously issued instructions Real-Time Economic Dispatch (RTED)
- Ancillary service awards for spinning or non-spinning reserves designated as contingency only are made available to the market
- Energy produced as a result of RTCD settles at real-time Locational Marginal Price (LMP)

## Exceptional Dispatch (ED)

- Exceptional dispatch (ED) is used to prevent a situation that impacts system reliability, or an imminent system emergency, that cannot be addressed through normal market operations
- Entered manually by ISO operator into the real-time market optimization software
- May be used to meeting reliability requirements for voltage and contingencies
- Cannot set the Locational Marginal Price (LMP)
- Called “Manual Dispatch” when performed by WEIM Entity Operator

# Resource instructions sent via Automated Dispatch System (ADS)

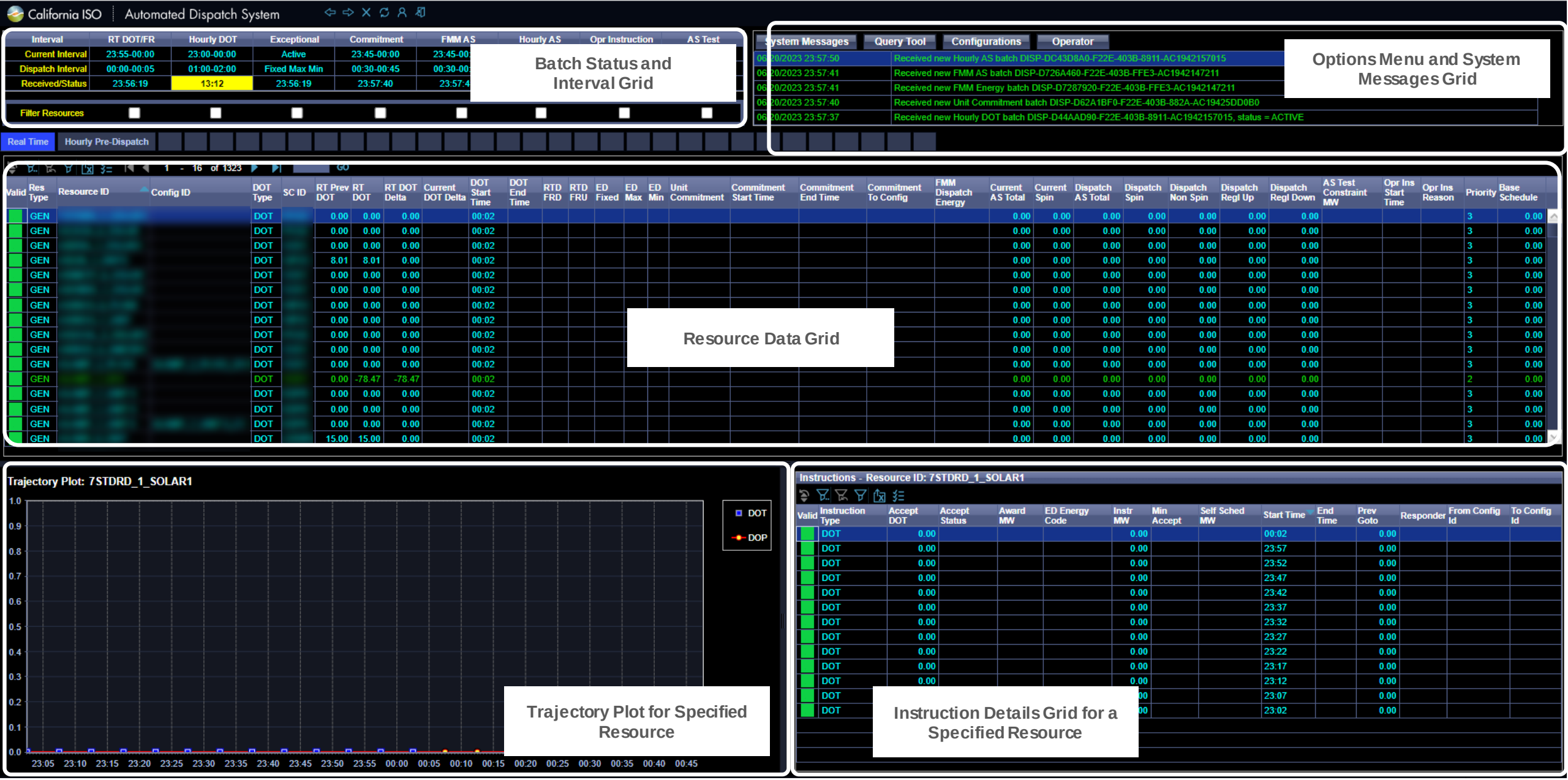
For each **fifteen-minute interval** the market is:

- Starting-up or shutting down resources
- Transitioning multi-stage generators (MSG)

For each **five-minute interval** the market is:

- Issuing real-time dispatch instructions

# EXPECTED RESPONSE TO DISPATCH AND OPERATING INSTRUCTIONS

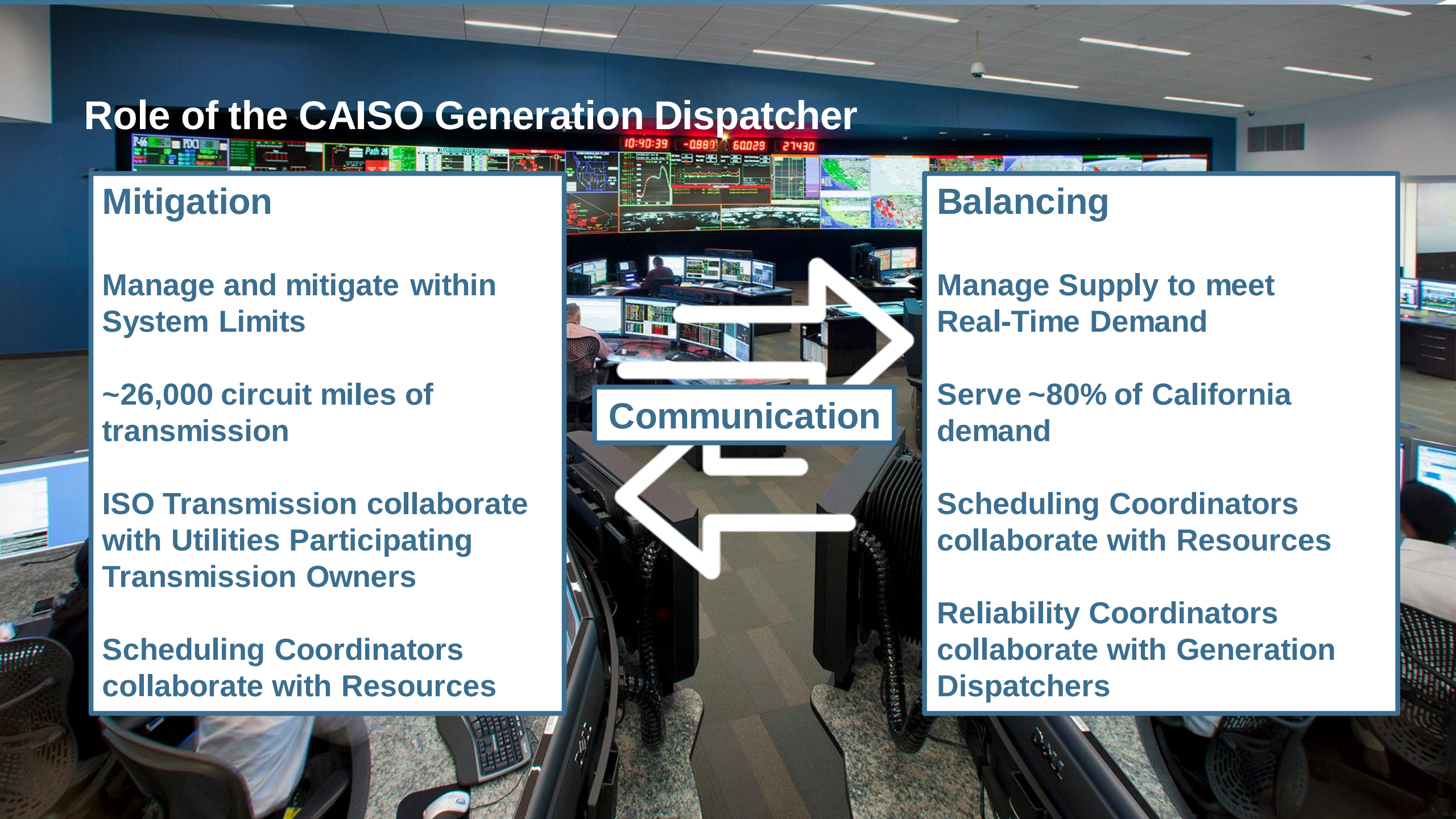

California ISO
Automated Dispatch System
Interval
RT DOT/FR
Hourly DOT
Exceptional
Commitment
FMM AS
Hourly AS
Opr Instruction
AS Test
Current Interval
Dispatch Interval
Received/Status
Filter Resources
Batch Status and Interval Grid
System Messages
Query Tool
Configurations
Operator
Received new Hourly AS batch DISP-DC43D8A0-F22E-403B-8911-AC1942157015
Received new FMM AS batch DISP-D726A460-F22E-403B-FFE3-AC1942147211
Received new FMM Energy batch DISP-D7287920-F22E-403B-FFE3-AC1942147211
Received new Unit Commitment batch DISP-D62A1BF0-F22E-403B-882A-AC19425DD0B0
Received new Hourly DOT batch DISP-D44AAD90-F22E-403B-8911-AC1942157015, status = ACTIVE
Options Menu and System Messages Grid
Real Time
Hourly Pre-Dispatch
Valid
Res Type
Resource ID
Config ID
DOT Type
SC ID
RT Prev DOT
RT DOT
RT DOT Delta
Current DOT Delta
DOT Start Time
DOT End Time
RTD FRD
RTD FRU
ED Fixed
ED Max
ED Min
Unit Commitment
Commitment Start Time
Commitment End Time
Commitment To Config
FMM Dispatch Energy
Current AS Total
Current Spin
Dispatch AS Total
Dispatch Spin
Dispatch Non Spin
Dispatch Regl Up
Dispatch Regl Down
AS Test Constraint MW
Opr Ins Start Time
Opr Ins Reason
Priority
Base Schedule
Resource Data Grid
Trajectory Plot: 7STDRD_1_SOLAR1
DOT
DOP
Trajectory Plot for Specified Resource
Instructions - Resource ID: 7STDRD_1_SOLAR1
Valid
Instruction Type
Accept DOT
Accept Status
Award MW
ED Energy Code
Instr MW
Min Accept
Self Sched MW
Start Time
End Time
Prev Goto
Responder
From Config Id
To Config Id
Instruction Details Grid for a Specified Resource

# Resource Management Priorities

1. **Immediately follow Operating Instructions when issued by the ISO**
2. **Notify the ISO immediately if your resource is incapable of following your Dispatch Operating Target**
3. **Ramp linearly to follow Dispatch Operating Points mid interval to mid interval**
4. **Follow Dispatch Operating Targets & Operating Instructions accurately**

**SCs and Resource Owner/Operators must work together**

# Role of the CAISO Generation Dispatcher



## Mitigation

Manage and mitigate within System Limits

~26,000 circuit miles of transmission

ISO Transmission collaborate with Utilities Participating Transmission Owners

Scheduling Coordinators collaborate with Resources

**Communication**

## Balancing

Manage Supply to meet Real-Time Demand

Serve ~80% of California demand

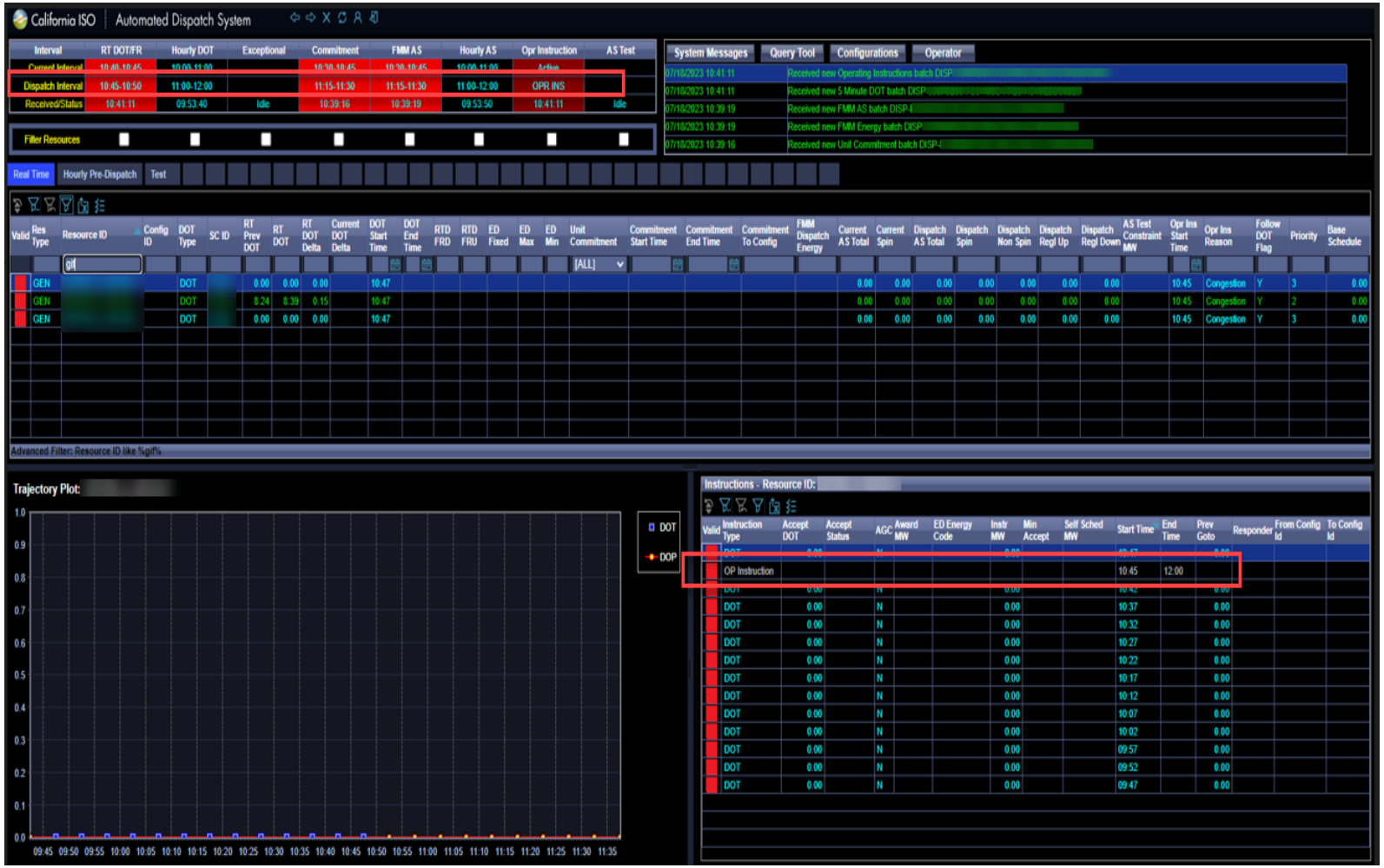
Scheduling Coordinators collaborate with Resources

Reliability Coordinators collaborate with Generation Dispatchers

# Operating Instructions

- Commands by Operators to preserve the state, status, output or input of a Bulk Electric System resource
- Emergency instructions may be received via **Energy Management System (EMS)** and/or **verbal communication**
- Emergency instructions may be received via Automated Dispatch System (ADS) as a result of Operator intervention
- Emergency instructions are **required to be followed within given timelines and ramp requirements** unless physically impossible, per Tariff Section 4.2.1

# Example Operating Instruction




Note Field will indicate **"Do not exceed DOT due to <Reason>"**

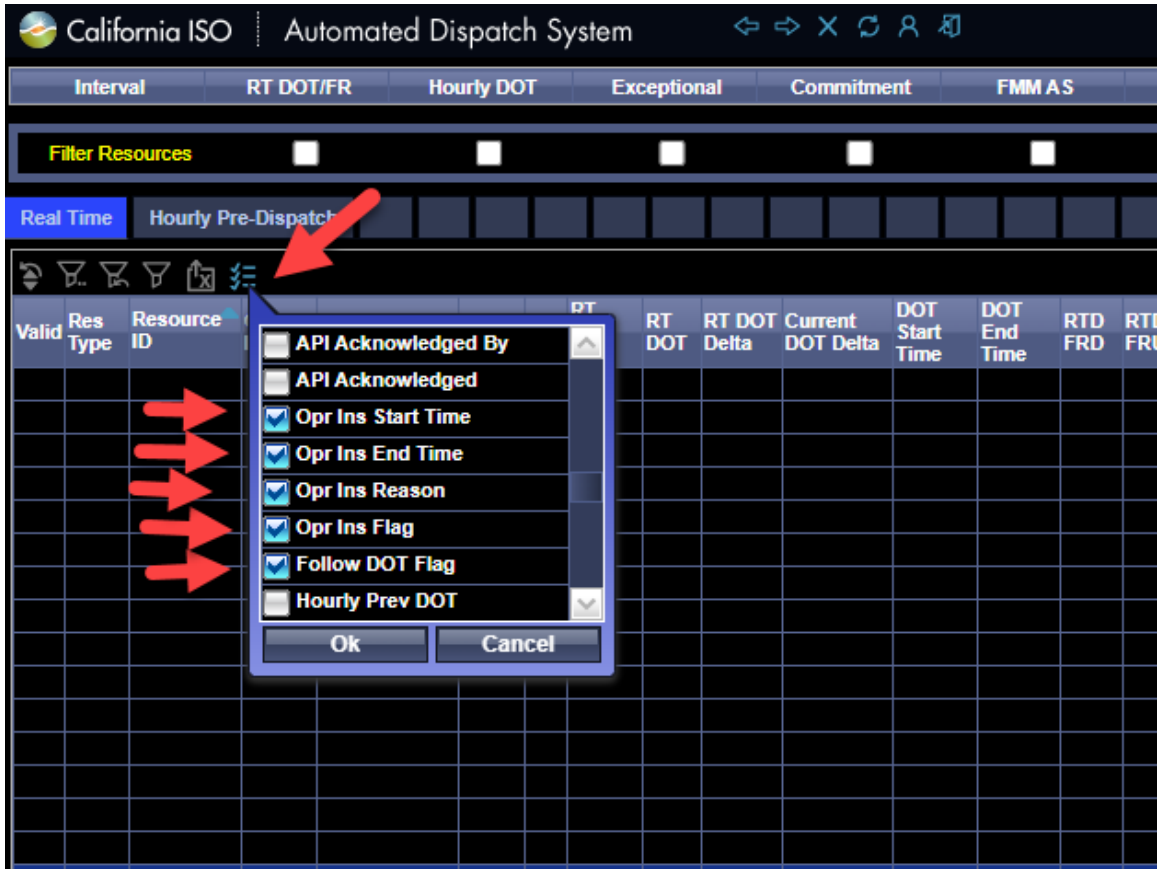
Resource obligated to comply with Operating Instruction **within 10 minutes**, ramping linearly with DOT

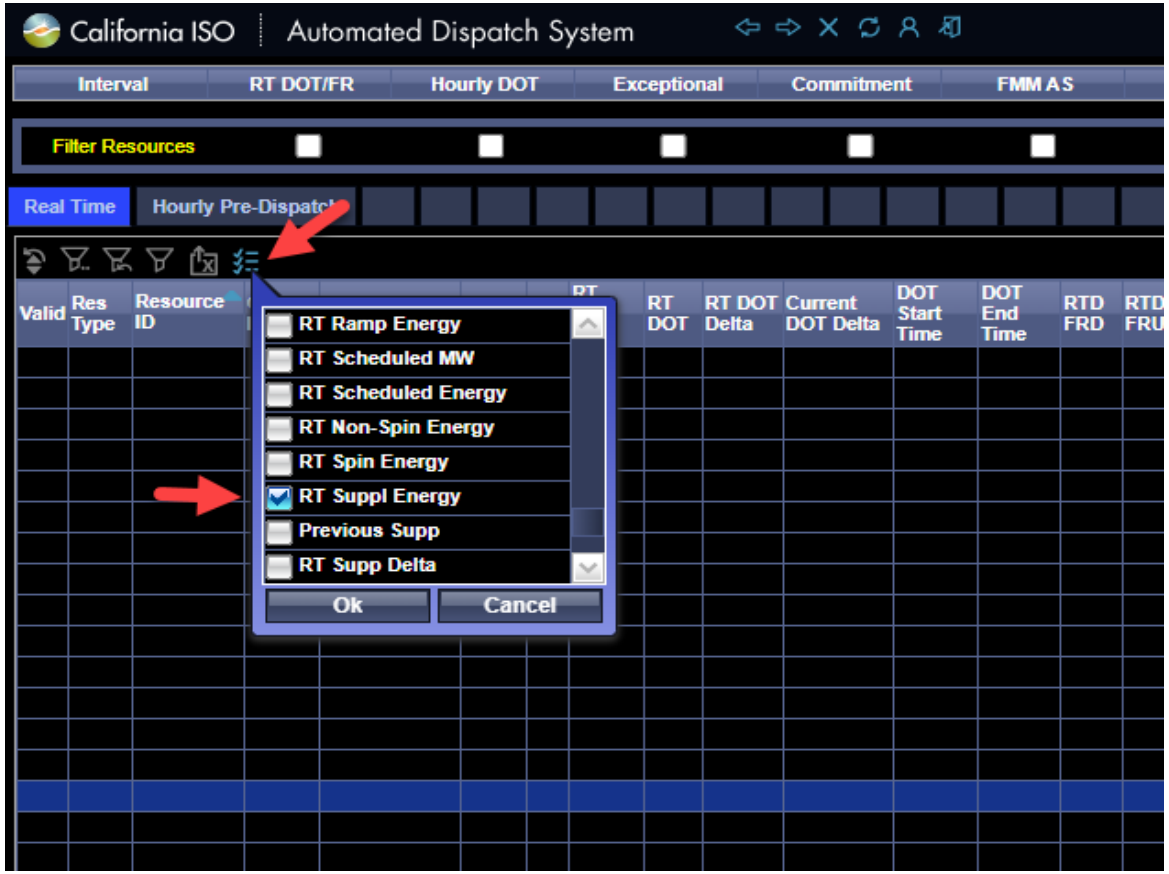
The message will only pop up **once per user per time horizon** of the instruction, and **will remain until acknowledged** by the user

# Example – Resource Not Following AGC Set Point Instruction

# Tip to Improve Visibility

**Make six (6) columns visible to see flags when resources are not following DOTs:**
Opr Ins Start Time, Opr Ins End Time, Opr Ins Reason, Opr Ins Flag, Follow DOT Flag, RT Suppl Energy



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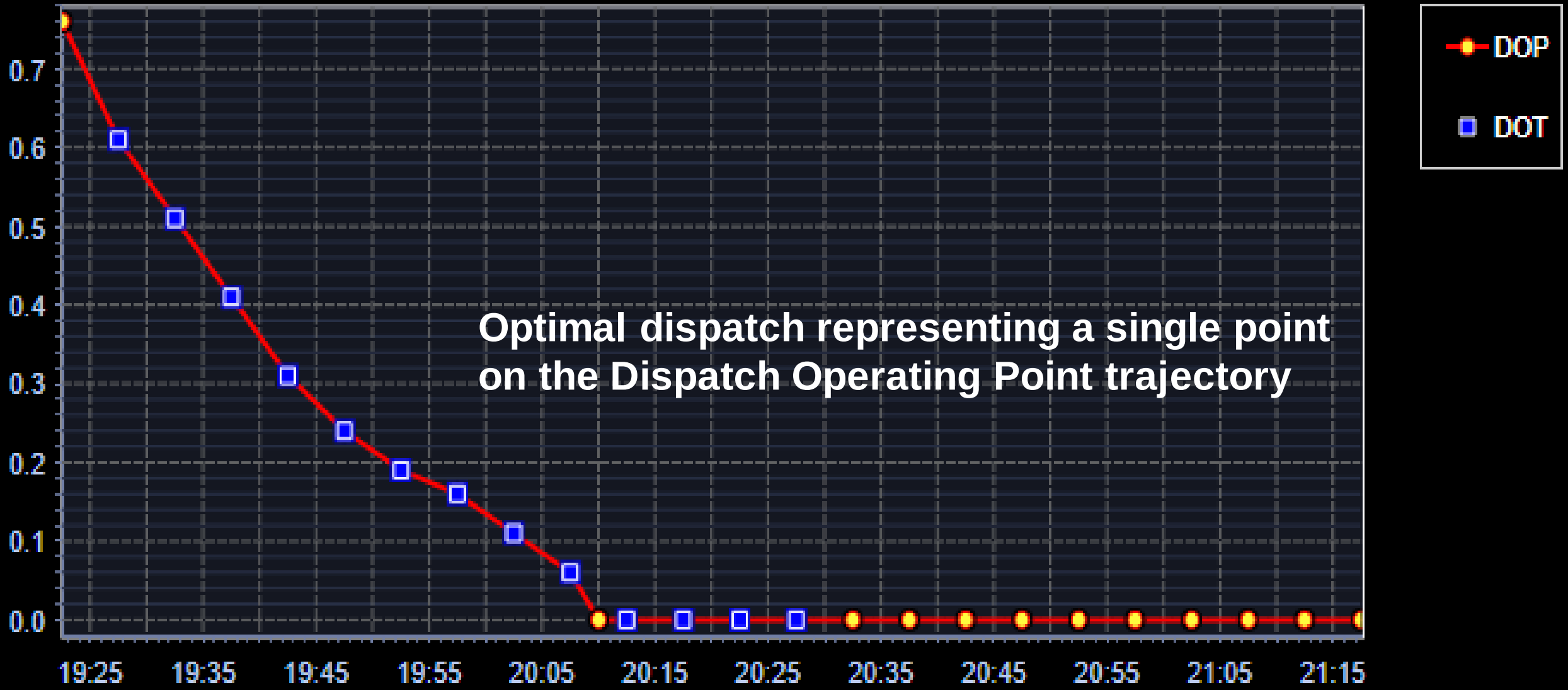
4. Follow Dispatch Operating Targets & Operating Instructions accurately

**SCs and Resource Owner/Operators must work together**

# Dispatch Operating Targets (DOT)

- Optimal dispatch representing a single point on the Dispatch Operating Point (DOP) trajectory
- Daily instructions are received via Automated Dispatch System (ADS)
- Resources expected to **perform as instructed**
- Eligible Intermittent Resources (EIRs) expected to **produce as capable** unless they receive an Operating Instruction

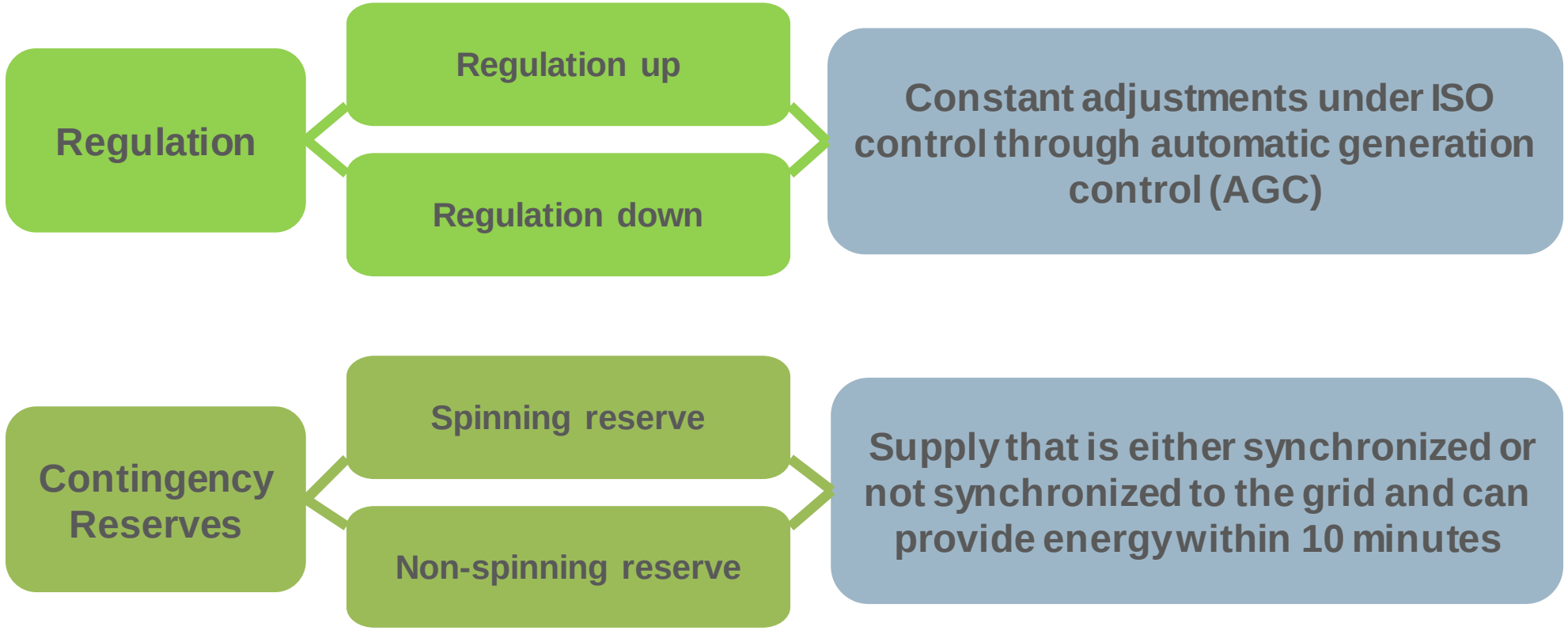
# Trajectory Plot:



# Set Points vs. Base Points

- **Set points** are a megawatt output target for a participating generator
- **Base points** are set by non-economic dispatches called manual base points (MBP)
- CAISO Automatic Generation Control (AGC) is normally set to send a direct MW set point **signal to all participating units every four seconds**
- The difference between the set point and base point is the MW quantity of regulation service that a unit is providing at a given moment in time, commonly called '**mileage**'

# Contingency Reserve (CR) instructions sent through Automated Dispatch System (ADS)



# Communicating unavailability of resources using outages

When **should** an outage be submitted?

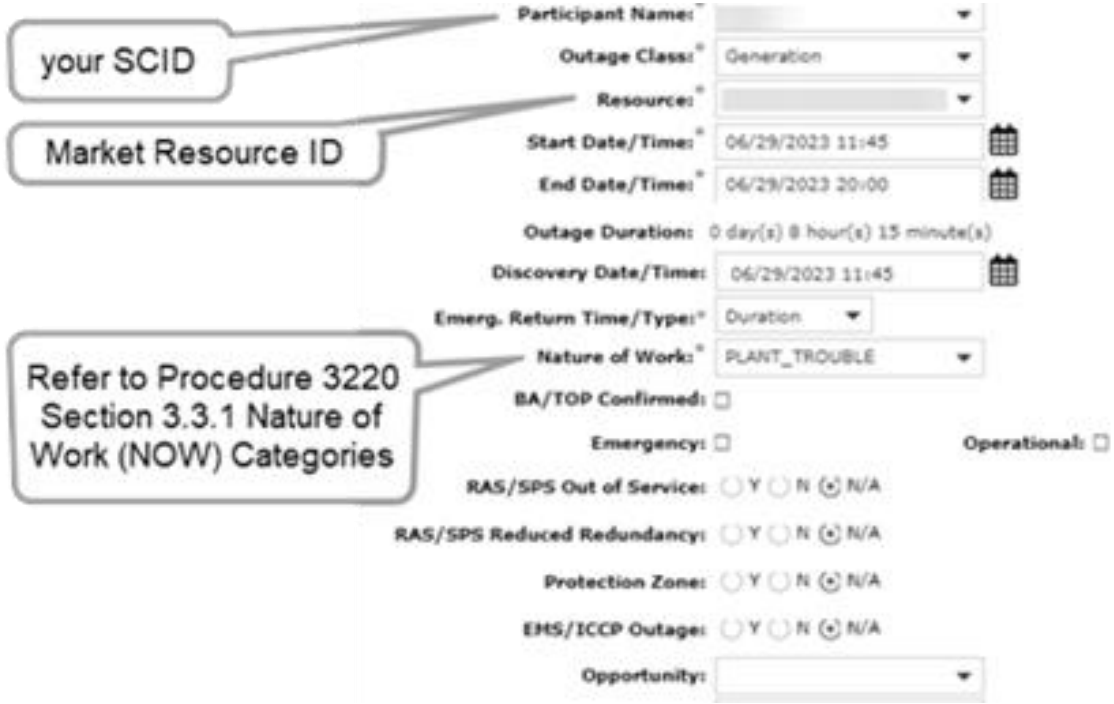
When a physical restriction limits a unit's output and must be submitted regardless of whether it is expected to be a long or serious outage

When should an outage **NOT** be submitted?

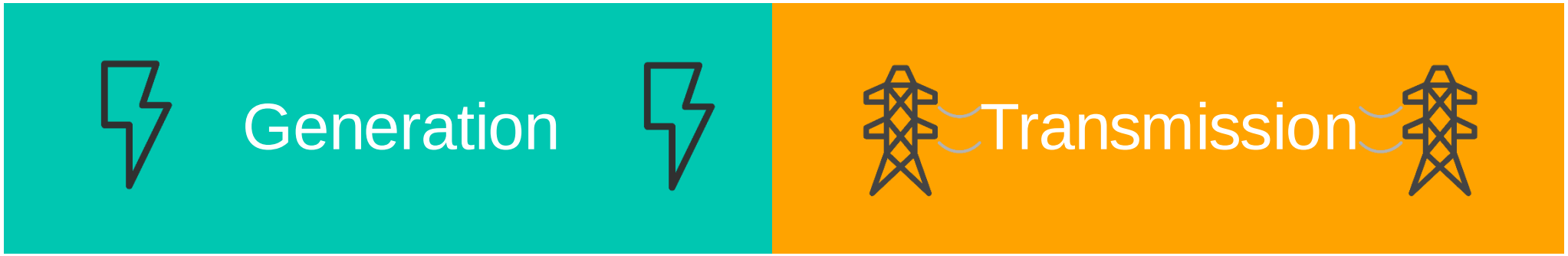
For economic reasons

Where can I learn more about outages?

[Business Practice Manual](#)
[Outage Management](#)
Outage timeframes Section 2.4
Outage types Section 3.1



# Resource availability provided via outage data



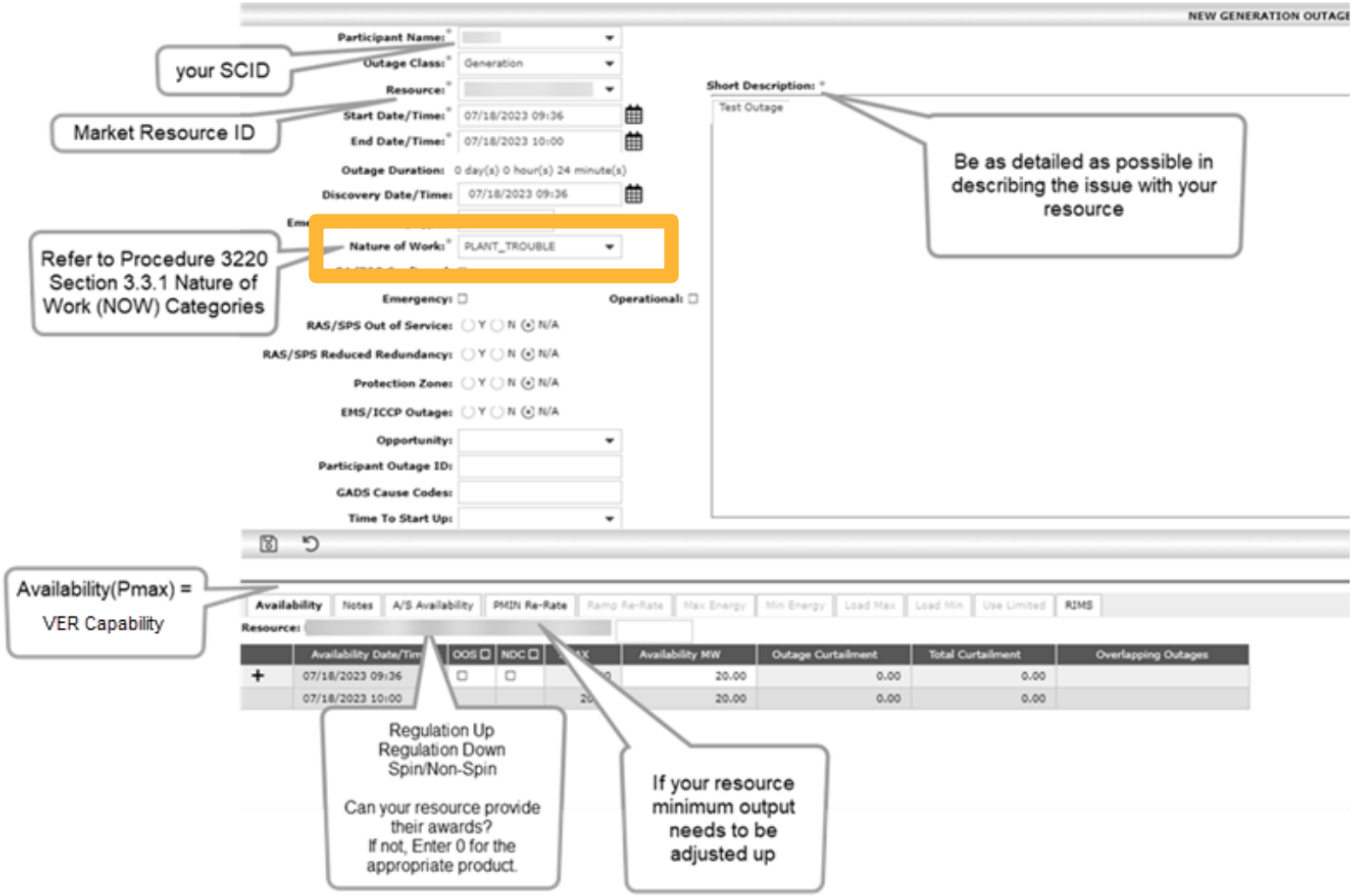

Master File provides the market with information on generating resources

Resource availability values are sent to market systems - setting the limits for forward schedules and real-time dispatches

The market runs a power flow calculation which takes into account the status of the bulk electrical system

# Outage Management System (webOMS)

**Solar Example**



# Outages are treated differently in Day-ahead vs. Real-time

| Day-Ahead | Real-Time |
| --- | --- |
| After the outage planned **end time**, the market adds the start-up time to the end of the outage, before awarding the unit | The market assumes that **start-up time** is part of the outage |

Example: If an outage ends at 6:59am and there's a bid for HE8 (7am – 8am) the market could dispatch the resource

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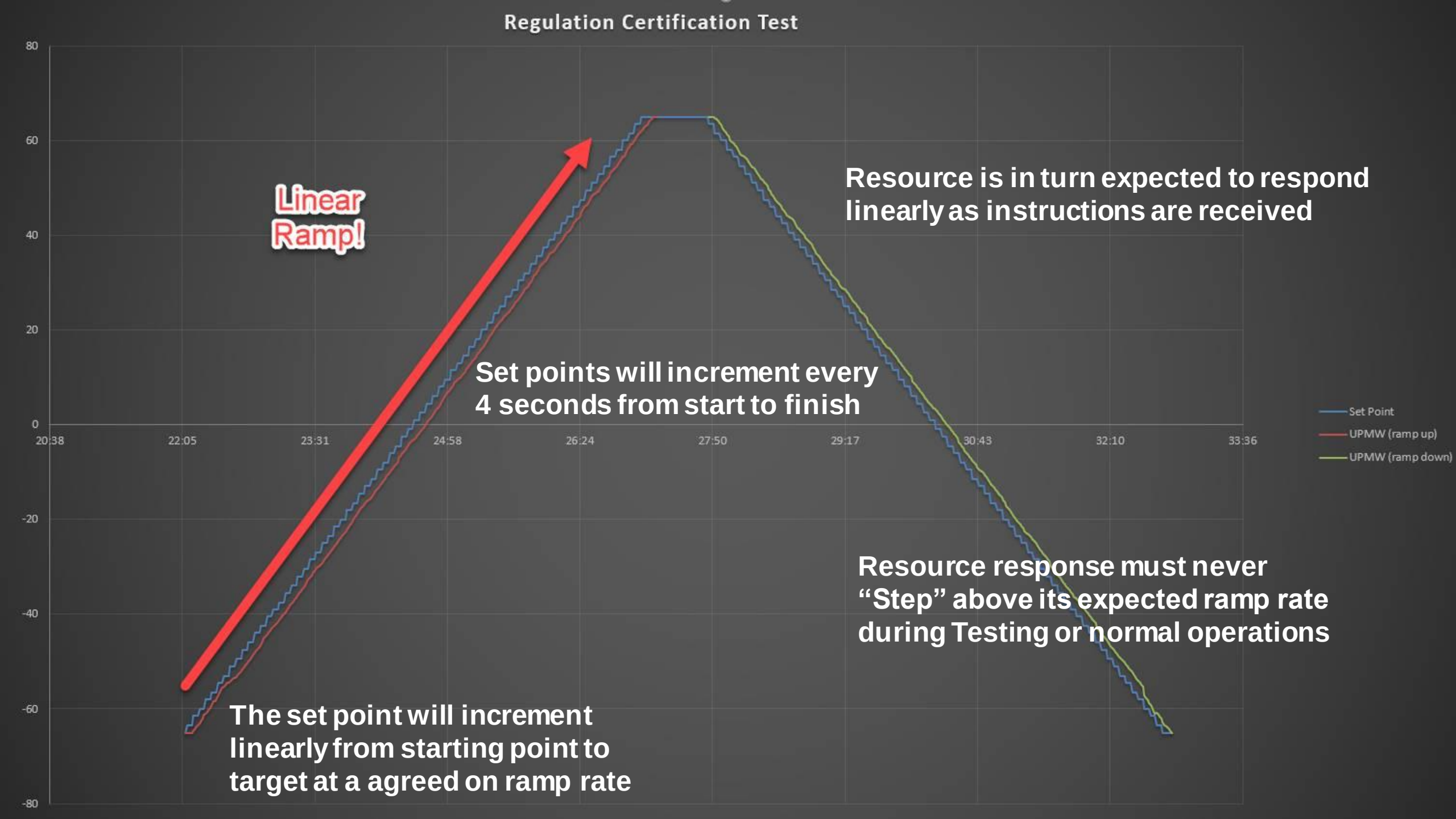
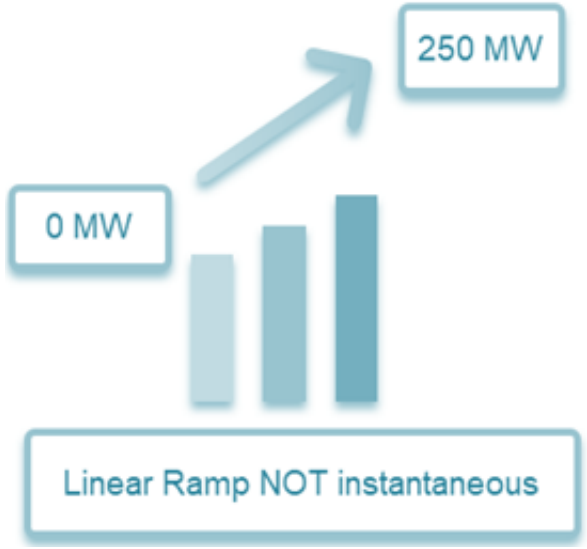
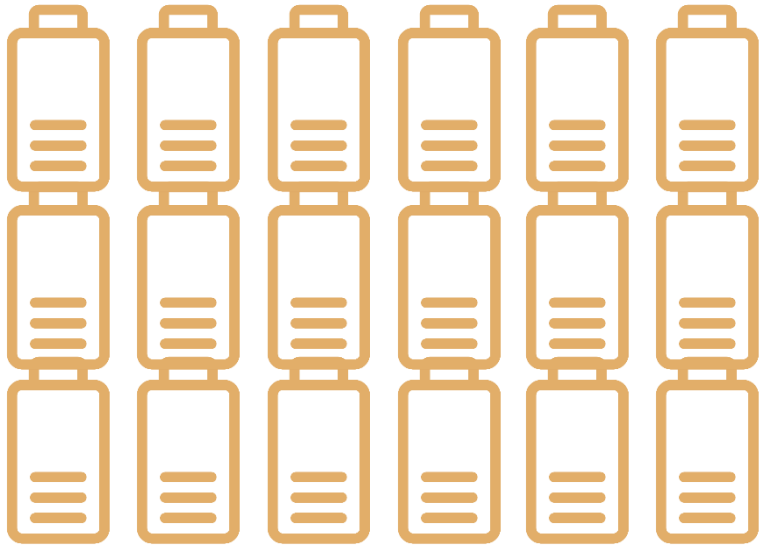
**SCs and Resource Owner/Operators must work together**


Regulation Certification Test
80
60
40
20
0
-20
-40
-60
-80
20:38
22:05
23:31
24:58
26:24
27:50
29:17
30:43
32:10
33:36
Set Point
UPMW (ramp up)
UPMW (ramp down)
Linear Ramp!
Resource is in turn expected to respond linearly as instructions are received
Set points will increment every 4 seconds from start to finish
Resource response must never "Step" above its expected ramp rate during Testing or normal operations
The set point will increment linearly from starting point to target at a agreed on ramp rate

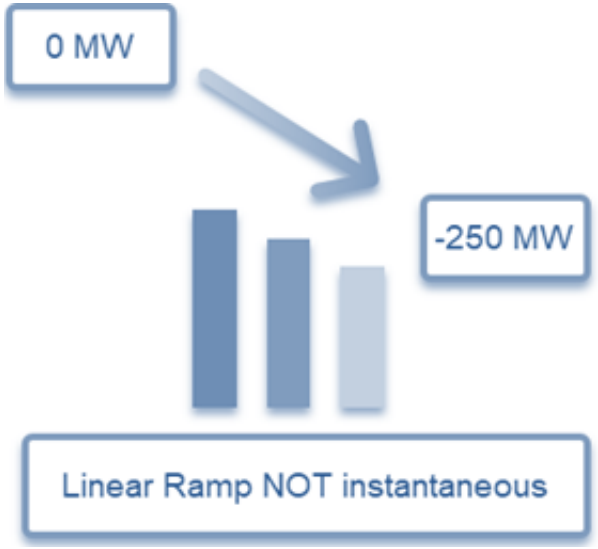
# Battery Linear Ramping

## Discharge (+)



## Charge (-)



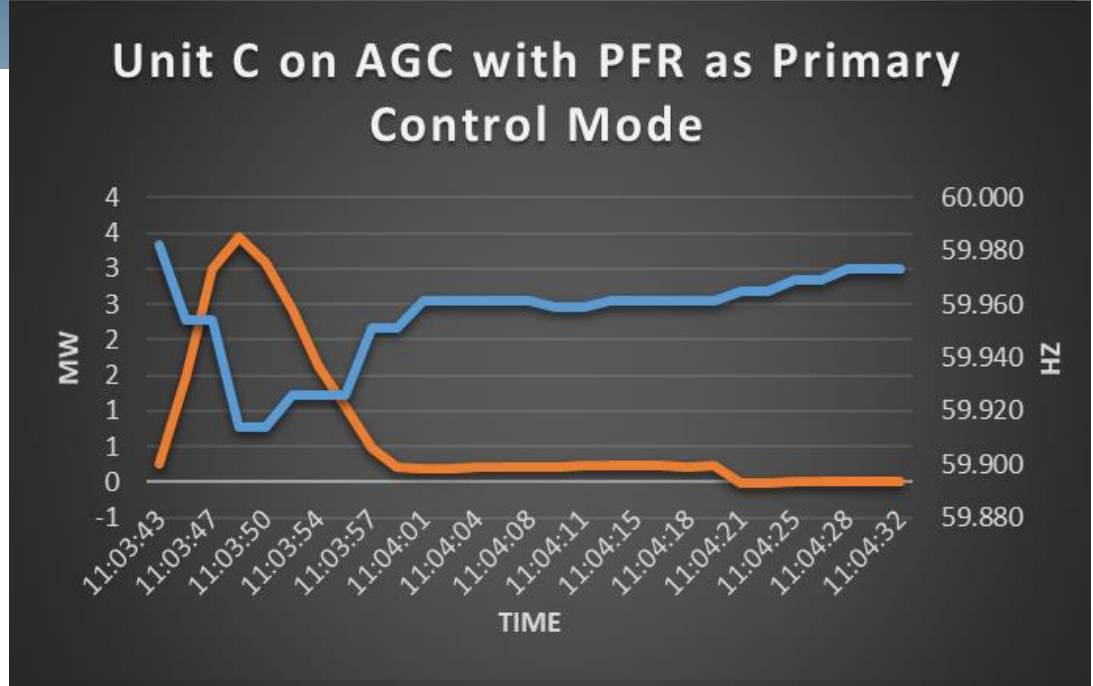
# Storage Key Terms

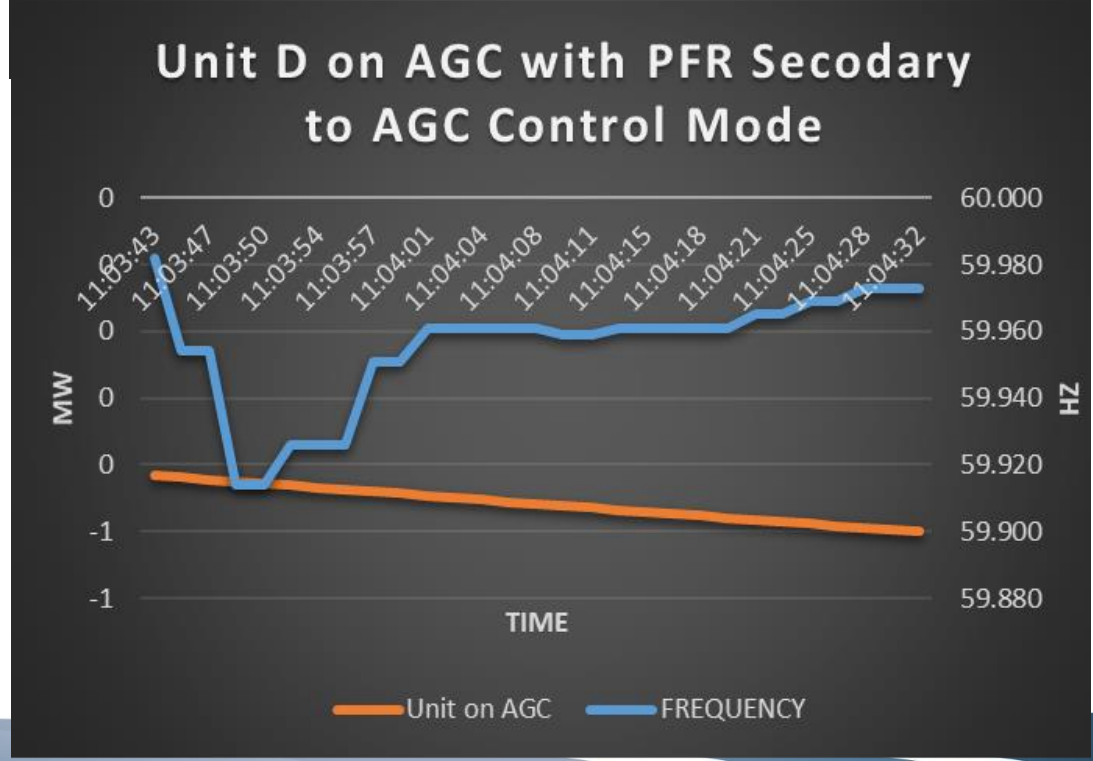
| | |
|---|---|
| **Primary Frequency Response (PFR)** | First stage of frequency control and is the response of generator governors and loads to arrest locally detected changes in frequency |
| **Droop (FERC Order 842)** | Variation in real power (MW) output due to variations in system frequency and is typically expressed as a percentage -- e.g. 5% droop -- and reflects the amount of frequency change from nominal e.g. 5% of 60 Hz is 3 Hz necessary to cause the main prime mover control mechanism of a generating facility to move from fully closed to fully open |
| **Deadband (FERC Order 842)** | Represents a minimum frequency deviation e.g. ±0.036 Hz from nominal system frequency -- 60 Hz in North America -- that must be exceeded in order for the generating facility to provide primary frequency response |

# Primary Frequency Response (PFR)

**PFR needs to be the Primary Control Mode and be additive** to other control modes

Most battery storage facilities have Automatic Generation Control (AGC) as the primary control mode



# Managing State of Charge (SOC) for resources

## Day-Ahead Market

Resources submit SOC for HE01 into Scheduling Infrastructure and Business Rules (SIBR)

**Regulation Energy Management (REM)**
The REM SOC is 50% so they have equal upward/downward mobility

**Non-Regulation Energy Management (NREM)**
The market tracks a resource's SOC and uses it to determine when to charge/discharge in order to optimize it across the 24-hour period

## Real-Time Market

Monitors resources SOC using telemetry -- the measurement of flow on the lines – and ensures that sufficient SOC is reserved to support market awards

# Managing State of Charge (SOC) for storage resources

**Reserves**

Spinning and Non-Spinning awards ensure that 30 minutes of SOC is reserved in the Fifteen Minute Market (FMM) and Real-time Dispatch (RTD)

**Regulation**

Regulation Up and Regulation Down awards ensure that 30 minutes of SOC is reserved in the Fifteen Minute Market (FMM) and Real-time Dispatch (RTD) and 20 minutes of SOC for Real-Time Contingency Dispatch (RTCD)*

*** For the 1st RTCD the market reserves 20 minutes and releases 10 minutes**
*** For the 2nd and beyond it releases all**

**Self Schedules**

Self-Schedules are respected by reserving SOC for Self-schedules outside of the RTD horizon and then RTD ensures that SOC is reserved to meet the Self-Schedule for the hour

# Resource Management Priorities

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**SCs and Resource Owners / Operators must work together**

# Rules, guidelines and instructions define market and reliability processes

# Resource Performance Issue for resources within the ISO BAA

- Increases the awareness of resource performance issues by notifying SCs via email when resources fail to perform as expected and in accordance with the ISO Tariff
- SCs are responsible for coordinating with resource owners and scheduling desks to ensure understanding and corrective actions are being taken
- Categories to be monitored:

**Resource failed to follow CAISO Dispatch Operating Instruction (DOT)**

**Resource failed to ramp in a linear manner**

**Resource failed to transition correctly between Automated Generator Control (AGC) to DOT**

**Resource failed to be on and/or follow AGC**

# Possible Consequences of Non-response

| | |
|---|---|
| **Settlements** | Economic Consequences |
| **Regulatory** | Contractual Consequences |
| **Enforcement** | Report to FERC, NERC/WECC, CAISO DMM |

# Resource Owner / Operators Desk Reference Guide

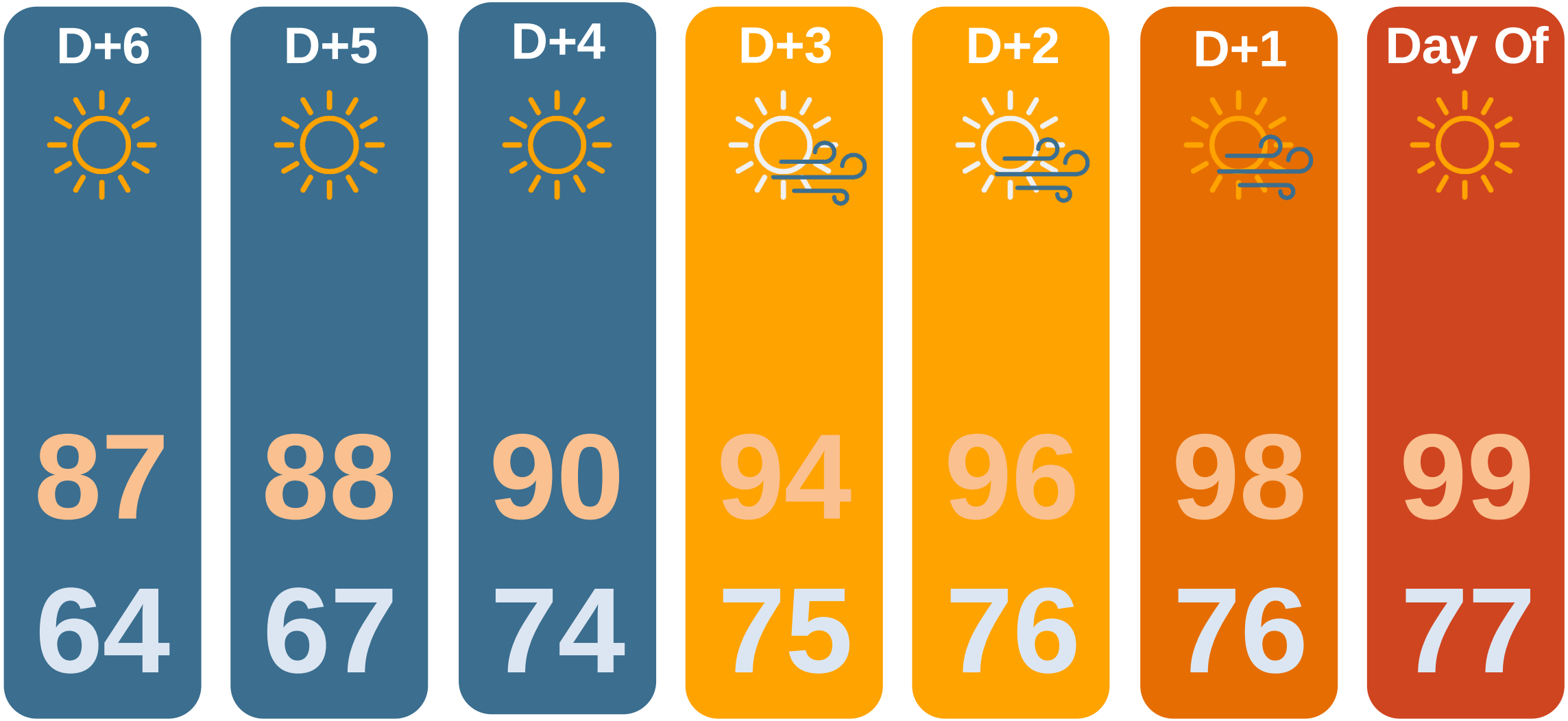

- Resource Owners / Operators Desk Reference Guide – Overview
- Training Resources
- Knowledge Articles
- Policies & Procedures
- New Resource Implementation Documents

# Summer Readiness

- Communicate between Scheduling Coordinator and Resource Operator to ensure adequate control of resources
- Respond to Operating Instructions within required time parameters, consistent with Tariff requirements
- Submit detailed outage cards reflecting physical limitations
- Ensure proper set up for resource testing and performance
- Be ready to respond to emergency notifications
- Register accurate information in Master File
- Actively monitor your resources
- Report suspicious activity

# CAISO EMERGENCY PLAYBOOK

# 7 Day Outlook



# 7-day resource adequacy capacity trend

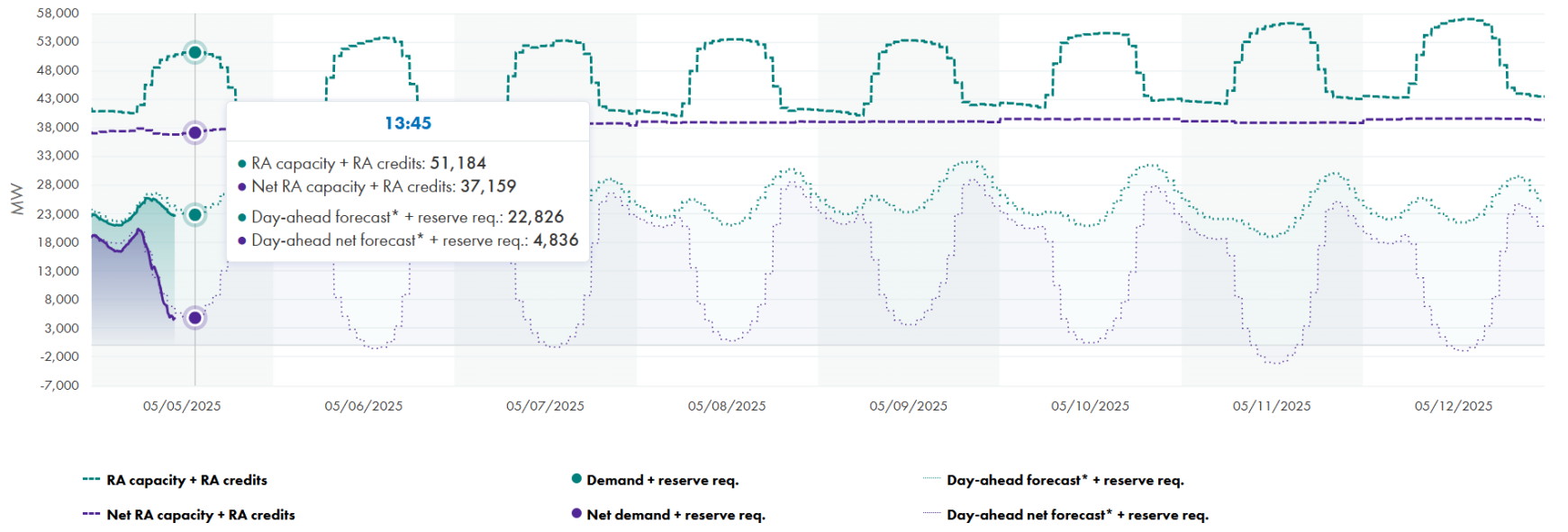
Today's Outlook | Demand | Supply | Emissions | Prices | AS OF 11:00 05/05/2025

Current | Demand trend | Net demand trend | Resource adequacy trend | 7-day resource adequacy trend

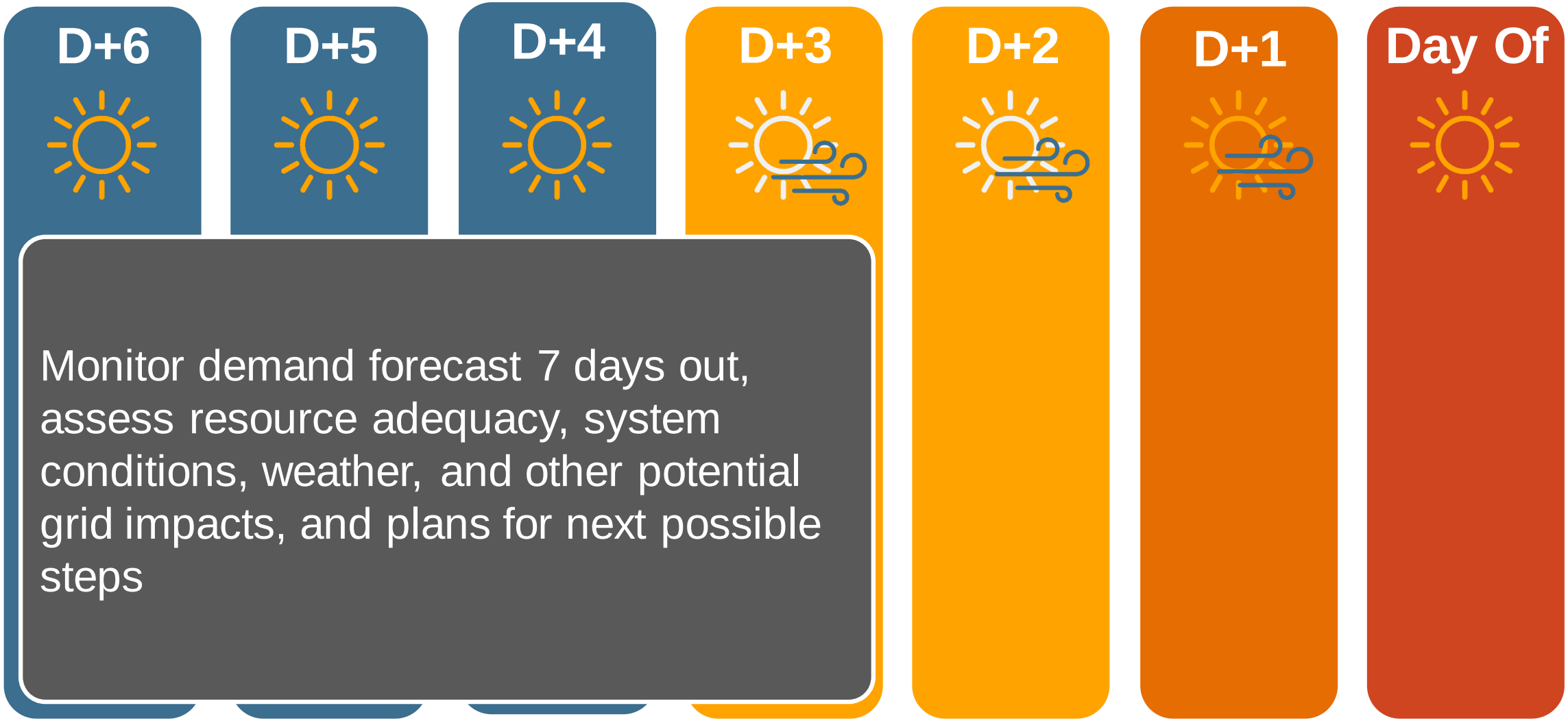
## 7-day resource adequacy capacity trend

Resource adequacy capacity forecast for today plus the next 7 days, in megawatts, compared to demand forecast plus reserve requirements.

Options ▾ Download ▾



# 4 – 7 Days Out


D+6
D+5
D+4
D+3
D+2
D+1
Day Of
Monitor demand forecast 7 days out, assess resource adequacy, system conditions, weather, and other potential grid impacts, and plans for next possible steps

# 4 – 7 Days Out

## Operational Coordination

- Utilities
- Neighboring Balancing Authorities (BA)
- Emergency Load Reduction Program (ELRP) Board
- RC West

**Depending on actual and potential system conditions, outreach and coordination re: possible extreme event to:**

- Governor's Office (GO)
- Long-start strategic reserve resource scheduling coordinators (LS-SRR SCs)

**Consider need for DOE 202c orders and whether other government agency assistance may be needed**

## Public and Customer Communications

**CAISO may issue Flex Alert and/or EEA Watch notice via:**

- ISO Today mobile app
- MNS
- Email
- Today's Outlook
- News release
- Daily Briefing notice
- Social media
- FlexAlert.org

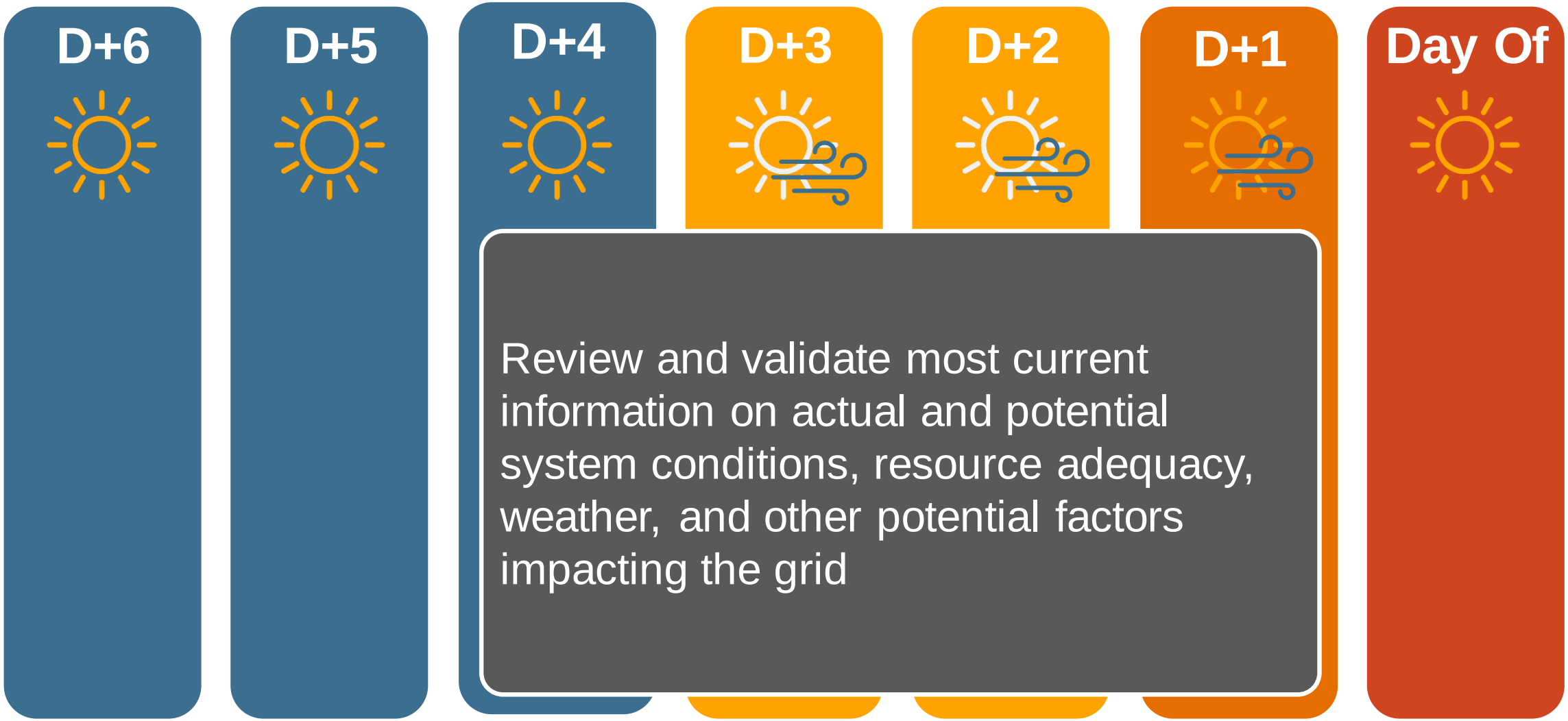
**De-escalate / all-clear notices issued via:**

- ISO Today mobile app
- MNS
- Email
- Today's Outlook
- Social media

**CAISO may issue High temperature heads up via:**

- CAISO website
- CAISO social media

# 1 – 4 Days Out


D+6
D+5
D+4
D+3
D+2
D+1
Day Of
Review and validate most current information on actual and potential system conditions, resource adequacy, weather, and other potential factors impacting the grid

# 1 – 4 Days Out

## Operational Coordination

**To prepare entities for possible conservation efforts and free up additional supply, CAISO may initiate communication to:**

- Water agencies (CDWR, MWD)
- Neighboring Balancing Areas
- Emergency Load Reduction (ELRP) Board
- Utilities
- RC West
- Regulatory Agencies

**Coordinate the following:**

- Requests for Department of Energy (DOE) 202c Orders
- Emergency supply above approved permit and/or GIA
- Governor's Office (GO) Proclamation of a State of Emergency and/or GO Executive Orders

## Public and Customer Communications

**CAISO may issue Restricted Maintenance Operations (RMO) via:**

- ISO Today mobile app
- MNS
- Email
- Today's Outlook

**Also publicly posted:**

- DOE Orders
- GO Proclamations and Orders

# 1 Day Out

D+6

D+5

D+4

D+3

D+2

D+1

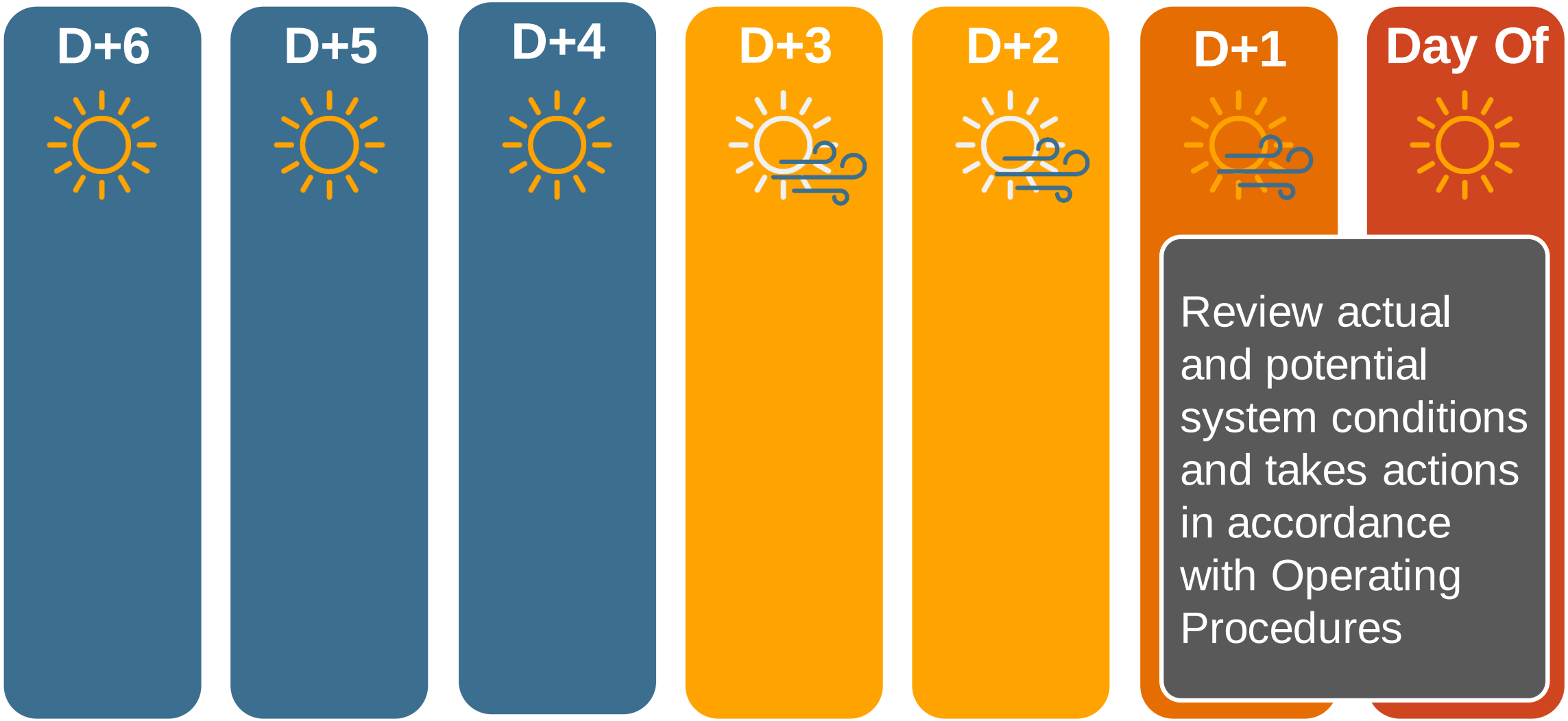
Day Of

Review and validate Day Ahead Market results and most current information on actual and potential system conditions, resource adequacy, weather and other potential factors impacting the grid

# 1 Day Out

| Operational Coordination | Public and Customer Communications |
| --- | --- |
| • Utilities<br>• Neighboring BAs<br>• ELRP Board<br>• RC West | **CAISO may issue Flex Alert and/or EEA Watch notice via:**<br>• ISO Today mobile app<br>• MNS<br>• Email<br>• News release<br>• Daily Briefing notice<br>• Social media<br>• FlexAlert.org |

# Operating Day



# Operating Day

## Operational Coordination

- Utilities
- Neighboring Balancing Authorities (BA)
- Emergency Load Reduction Program (ELRP) Board
- RC West

## Public and Customer Communications

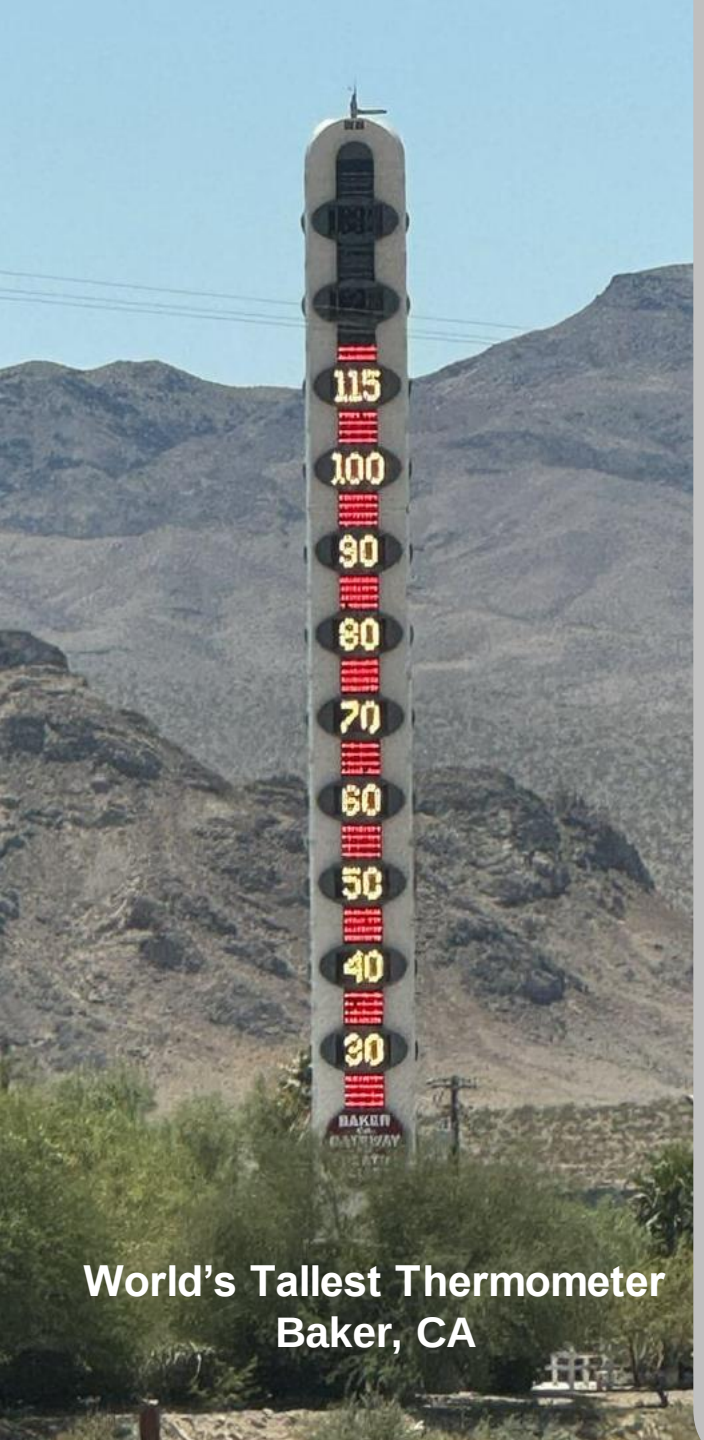
**CAISO may issue Flex Alert and/or EEA Watch notice via:**

- ISO Today mobile app
- MNS
- Email
- Today's Outlook
- News release
- Daily Briefing notice
- Social media
- FlexAlert.org

**De-escalate / all-clear notices issued via:**

- ISO Today mobile app
- MNS
- Email
- Today's Outlook
- Social media

# ENERGY EMERGENCY ALERTS (EEA)




World's Tallest Thermometer
Baker, CA


**Firm Load Interruption / Ordering Rotating Outages**

**Prepare For Possible Rotating Outages**

**Load reduction programs and emergency operating plans**

**Real-time energy supply tight**

**Day-ahead energy supply tight**

**Incentivize customers to conserve energy**

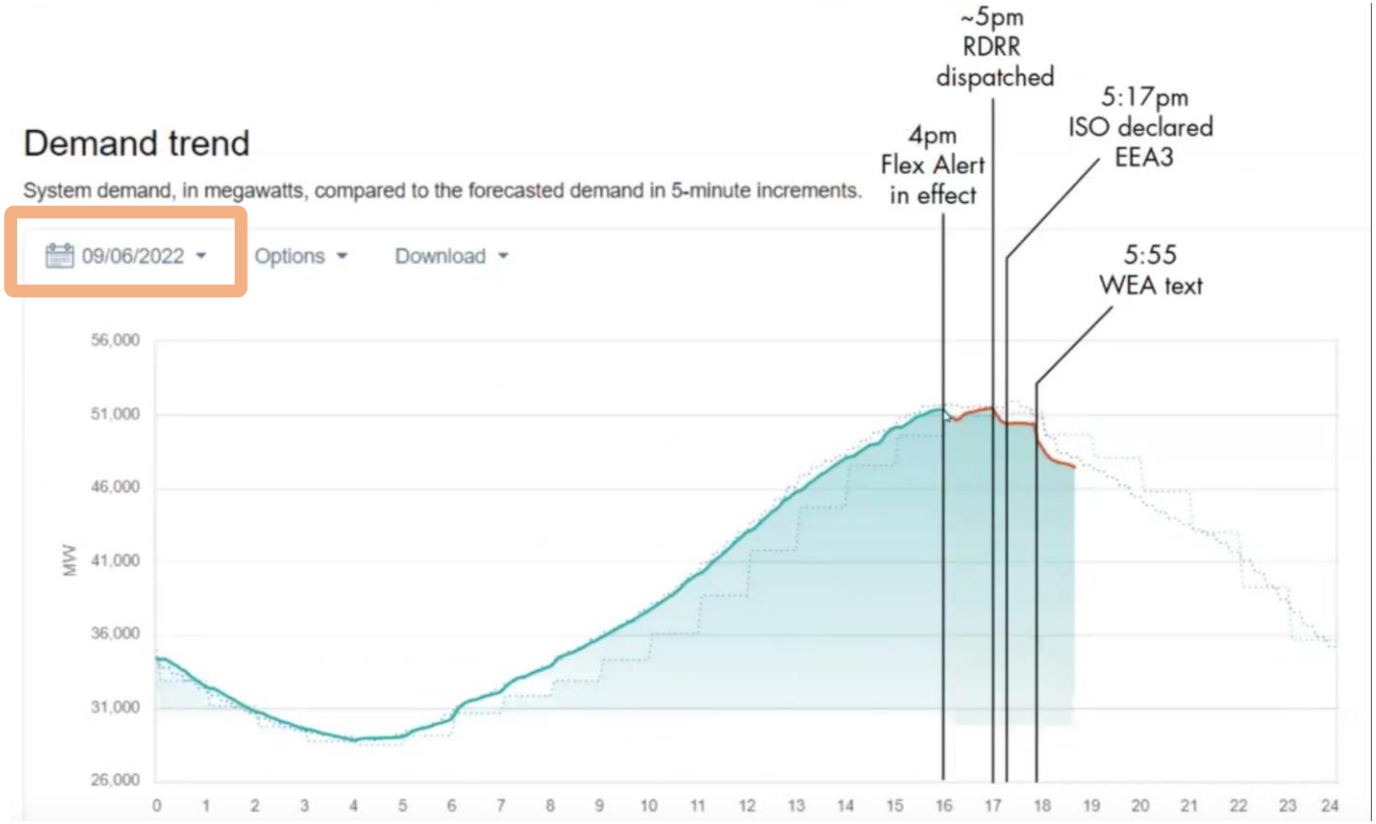
**Maintenance postponed to ensure resource availability**

# Heat Event

- 7 day outlook indicating record high temperatures across the Western U.S.
- CAISO BA peak load forecast is above 50,000 MW
- CAISO RA capacity is below forecast load
- Rest of WECC reporting potential record high loads
- No major transmission or generation outages

# Labor Day Weekend 2022

| Trade Date | RMO | Flex Alert | EEA Watch | EEA 1 | EEA 2 | EEA 3 |
|---|---|---|---|---|---|---|
| August 31 | | | | | | |
| September 1 | | | | | | |
| September 2 | | | | | | |
| September 3 | | | | | | |
| September 4 | | | | | | |
| September 5 | | | | | | |
| September 6 | | | | | | |
| September 7 | | | | | | |
| September 8 | | | | | | |
| September 9 | | | | | | |



# Emergency Notifications

*Energy shortages can be caused by persistent high heat, equipment failure, weather events, or natural disasters, such as wildfires. When electricity supply is tight, the California ISO uses an alert system to keep the public informed. The ISO recently transitioned to a series of notifications that match the North American Electric Reliability Corporation's (NERC) Energy Emergency Alert (EEA) system to be consistent with alerts used by the RC West and other balancing authorities in the Western Electricity Coordinating Council (WECC). Learn more about EEAs.*

**Flex Alert**

A Flex Alert is a call to consumers to voluntarily conserve electricity when the ISO anticipates energy supply may not meet high electricity demand. Reducing energy use during a Flex Alert can prevent more dire measures, such as moving into EEA notifications, emergency procedures, and even rotating power outages. Visit the ISO's Flex Alert website for energy conservation tips and to sign up for notifications.

**Restricted Maintenance Operations**

When high demand is anticipated, the ISO will caution utilities and transmission operators to avoid taking grid assets offline for routine maintenance to assure that all generators and transmission lines are available.

**Transmission Emergency**

Declared for any event threatening or limiting transmission grid capability, including line or equipment overloads or outages.

**Energy Emergency Alert Watch (EEA Watch)**

Analysis shows all available resources are committed or forecasted to be in use, and energy deficiencies are expected. This notice can be issued the day before the projected shortfall or if a sudden event occurs. Consumers are encouraged to conserve energy.

**Energy Emergency Alert 1 (EEA 1)**

Real-time analysis shows all resources are in use or committed for use, and energy deficiencies are expected. Consumers are encouraged to conserve energy.

**Energy Emergency Alert 2 (EEA 2)**

ISO requests emergency energy from all resources and has activated emergency energy programs. Consumers are urged to conserve energy to help preserve grid reliability.

**Energy Emergency Alert 3 (EEA 3) – Preparing for rotating power outages**

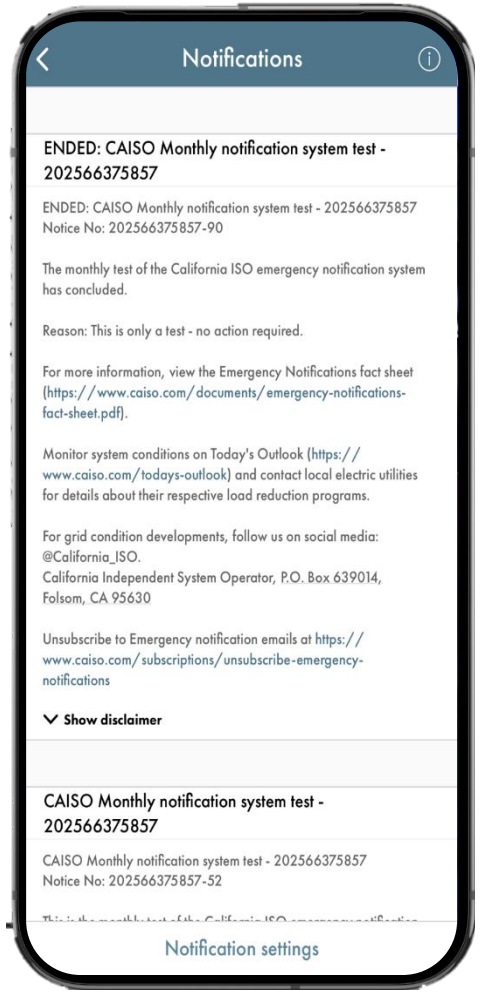
The grid operator is unable to meet minimum reliability reserve requirements and has declared the initial step of an EEA 3. Utilities have been alerted to prepare for outages, but rotating outages have not been ordered.

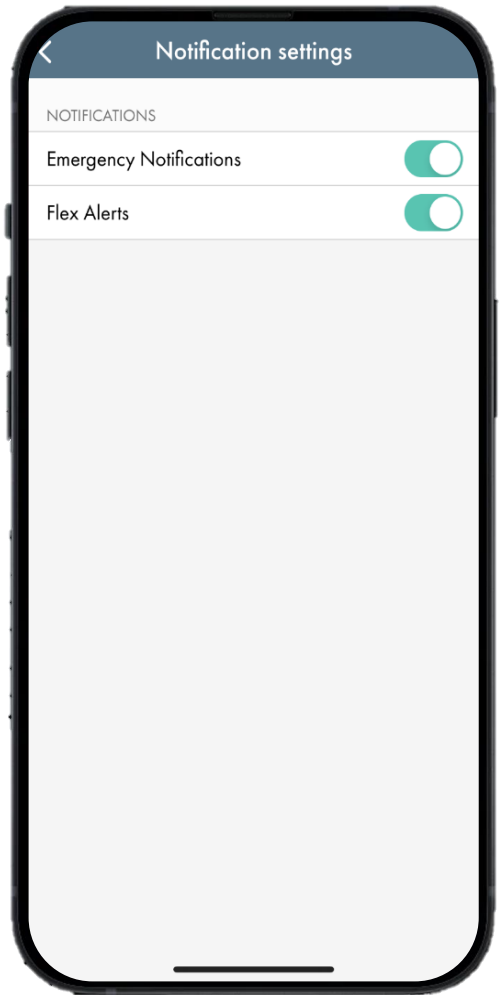
**Energy Emergency Alert 3 (EEA 3) – Ordering rotating power outages**

The grid operator has ordered utilities to begin rotating power outages to protect grid reliability. The final step of an EEA 3 is declared when electricity supply is not sufficient to meet demand and required reserves are unable to be maintained.

*To learn more about emergency notifications, go to ISO System Emergency procedures.*

*To monitor grid conditions, visit Today's Outlook and download the ISO Today mobile app.*

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California ISO

# Restricted Maintenance Operations (RMO)

## What is happening in the Balancing Area (BA)?

Actual or potential impacts to balancing and/or transmission operation

## What's needed?

Reschedule planned work to keep equipment and resources in service if outages could threaten grid reliability

## By when?

Ideally issued in advance, day ahead

# Flex Alert

## What is happening in the Balancing Area (BA)?

Potential energy shortages or gas curtailments, ongoing grid issue (fire, natural disaster), variable or uncertain temperature forecast, cloud cover, etc.

## What's needed?

Public awareness to reduce the demand for energy by voluntary means

## By when?

Ideally issued in advance, day ahead

# EEA Watch

## What is happening in the Balancing Area (BA)?

Day ahead analysis is forecasting one or more hours energy deficient

## RC Confirm / Translate

All available generation projected to be in use

## What's needed?

Additional bids, incremental dispatch

## By when?

Issued in advance, day ahead by 15:00 PPT

# EEA 1

## What is happening in the Balancing Area (BA)?

Real time analysis is forecasting one or more hours energy deficient

## RC Confirm / Translate

All available generation in or projected to be in use

## What's needed?

Be prepared for use of load management programs

## By when?

Issued in real time, ideally hours ahead

# EEA 2

## What is happening in the Balancing Area (BA)?

All available resources are in use expected energy requirements will no longer be met

BA is still able to maintain Contingency Reserve (CR) requirements

## RC Confirm/ Translate

Load management procedures in effect

## What's needed?

Additional bids, incremental dispatch, incrementally reduce exports, emergency assistance, evaluate transmission limitations

## By when?

Issued in real time, current or next hour(s)

# EEA 3 / Prepare for Potential Rotating Outages

## What is happening in the Balancing Area (BA)?

Counting armed firm load as non-spin contingency reserves

## RC Confirm / Translate

BA unable to maintain Contingency Reserves (CR), firm load interruption is imminent

## What's needed?

Emergency assistance, evaluate transmission limitations

## By when?

Issued in real time, current or next hour(s)

# EEA 3 / Prepare for Possible Rotating Outages

- The notice issued by Operations will be titled "**EEA 3**", but note that social media and news releases will indicate "**EEA 3 – Prepare for Possible Rotating Outages**"
  - Title difference is due to a limitation with the current operations notification system. This will be addressed later this year with a notification system replacement project.
- CAISO BA will contact the UDC/MSS entities capable of interrupting load (rotating outages) in 10 minutes
  - Could be needed if a contingency occurs to help keep the grid stable

**EEA 3 – Prepare for Possible Rotating Outages is NOT an instruction to interrupt firm load**

CAISO will issue Operating Instructions for firm load removal
**DO NOT act based on System Status Update emails**

# EEA 3 – Firm Load Interruption / Ordering Rotating Outages

## What is happening in the Balancing Area (BA)?

Unable to maintain CR, manual load shedding is starting / in progress

## RC Confirm / Translate

BA unable to maintain Contingency Reserves (CR), firm load interruption is in progress

## What's needed?

Receive firm load shed operating instructions (rotating outages) via blast call

## By when?

Issued in real time, "within in 10 minutes" in current or next hour(s)

# EEA 3 – Firm Load Interruption / Ordering Rotating Outages

- The notice issued by Operations will be titled **EEA 3 – Firm Load Interruption** but note that social media and news releases will indicate **EEA 3 – Ordering Rotating Outages**
- This notice is a separate notice from the initial **EEA 3**
- CAISO BA no longer able to meet demand and will initiate firm load shed operating instructions (rotating outages) **via blast call**.
- Will still require load armed as contingency reserve to be available for contingency

**Utilities should communicate with customers and rotate load blocks hourly in accordance with your respective emergency plans**

Year 2022 | MW Shed 500 | Display Load Colum

Shed Values — CAISO

| Zone | Fixed Pro-Rata Share | MW Curtailed |
|---|---|---|
| Pacific Gas and Electric | 46.38% | 232.06 |
| Southern California Edison | 39.09% | 195.59 |
| San Diego Gas & Electric | 8.50% | 42.52 |
| NCPA | 2.30% | 11.51 |
| Riverside | 1.22% | 6.11 |
| Anaheim | 1.00% | 5.01 |
| Pasadena | 0.51% | 2.55 |
| Vernon | 0.36% | 1.80 |
| Valley Electric | 0.30% | 1.50 |
| Azusa | 0.13% | 0.66 |
| Banning | 0.10% | 0.50 |
| Corona | 0.04% | 0.20 |

# Restoration – Emergency Downgrade and Return to Normal

1. **If firm load shed was required, CAISO BA will restore firm load as soon as system conditions allow**
2. **MW restoration values will be determined by Shift Manager pro rata**
3. **Downgrade from EEA 3 to EEA 2**

   Operating Instructions to restore firm load

   Operating Instructions to no longer “arm” firm load as Contingency Reserves
4. **Downgrade from EEA 2 to EEA 1**

   Operating Instructions and dispatch ended for RDRR and all available energy from UDC/MSS
5. **End EEA 1 and EEA Watch**
6. **Continued updates to Reliability Coordinator (RC) until event over and CAISO BA returned to EEA 0 with all Emergency notices cancelled**

# CAISO communication methods

| | X (formerly Twitter) | GMS | Emergency notification, MNS, Today's Outlook, ISO Today mobile app | Notice | Customer service email | System status update email | Blast call |
|---|---|---|---|---|---|---|---|
| Restricted Maintenance Operations | | X | X | | | | |
| Flex Alert (day ahead) | X | | X | X | | | |
| Flex Alert (day of) | X | | X | X | | | |
| EEA Watch (day of) | X | X | X | X | | X | |
| EEA 1 | X | X | X | X | | X | |
| EEA 2 | X | X | X | X | | X | |
| EEA 3 | X | X | X | X | | X | X |
| All clear | X | X | X | X | X | | |

## Subscribe or Unsubscribe

If you **would like to be added** to the Emergency Alert (EA) notification distribution list, sign up on the caiso.com Emergency notifications page

RC West area alerts also available on the RC West subscriptions page

# Operational Procedures

NERC Standards

- COM-002-4 - Operating Personnel Communications Protocol
- EOP-011-1 – Emergency Operations

RC West Procedures

- RC0410 – System Emergencies

CAISO BA Procedures

- 4420 – System Emergency
- 4410 – Emergency Assistance
- 4510 – Load Management
- 4510A

https://www.caiso.com/rules/Pages/OperatingProcedures/Default.aspx


Questions & Answers

**For more details visit www.caiso.com or contact CustomerReadiness@caiso.com**