



California ISO

2021 Joint Agencies CAISO Balancing Authority Area Electric Reliability Contingency Plan

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TABLE OF CONTENTS

Contents

SECTION 1: Contingency Plan Overview	1
Background	1
Purpose and Scope	1
SECTION 2: Contingency Coordination	3
SECTION 3: Roles and Responsibilities	4
CAISO	4
CEC	4
CPUC	5
SECTION 4: Contingency Resource Types	7
SECTION 5: Contingency Plan Timeline & Actions	9
Up to 7 Calendar Days Out	9
3 to 4 Calendar Days Out	9
1 Calendar Day Out	10
Day of Event	11
Post Event	11

SECTION 1:

Contingency Plan Overview

Background

In 2020, two extreme heatwaves impacted the western United States and strained electric system operations in California. One of the heat waves resulted in two days with rotating outages in the hours between 6 p.m. to 9 p.m. In response, Governor Newsom requested the California Energy Commission (CEC), California Independent System Operator (CAISO), and California Public Utilities Commission (CPUC) develop an analysis of the root causes of the electricity supply deficiencies.

The three energy institutions jointly published a [Final Root Cause Analysis \(RCA\)](#) on January 13, 2021.¹ In addition to identifying the causes of the electricity supply shortfalls, the RCA identified the need for advanced and timely coordination, including communication protocols.

The RCA also called for the CEC, in collaboration with the Governor's Office, CAISO, and CPUC to develop a contingency plan drawing and building on actions taken under the leadership of the Governor's Office to mitigate electricity supply shortfalls in August 2020, referred to here as the Contingency Plan.

Since the publishing of the RCA, the three energy institutions have analyzed conditions for summer 2021. At the CEC's May 4, 2021, Integrated Energy Policy Report (IEPR) Joint Agency public workshop on Summer 2021 Energy Reliability, the CEC presented two scenarios for the state. The scenarios were based on analysis for the months of August and September, which are typically the most critical months in the state for electric reliability. The analysis compared anticipated supply to demand in an average weather year and in an extreme weather year affecting the entire West. The analysis showed that there is sufficient anticipated supply to meet demand under average weather conditions. However, there would be a need to trigger up to 2300 megawatts (MW) of contingency resources during evening hours if the state and the rest of the West were to experience extreme heat, such as the conditions seen in 2020.

An updated analysis was presented at the CEC's July 8-9, 2021, IEPR Joint Agency public workshop on Summer 2021 Electric and Natural Gas Reliability. The updated analysis added July and the impacts of drought and supply changes, and showed the potential for a need of up to 3900 MW of contingency resources in the evening hours of an extreme weather event.

Purpose and Scope

The RCA identified the need for advanced and timely coordination for contingencies, including communication protocols and development of a contingency plan drawing and building on actions taken under the leadership of the Governor's Office to mitigate electricity supply shortfalls in August 2020.

¹ Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave, January 13, 2021, p. 73.

The purpose of this Contingency Plan is to systematize measures that were enacted last year under leadership from the Governor's Office, identify additional measures, and create the processes and structures to enable advanced coordination. This Contingency Plan describes how the energy institutions will coordinate in advance of and throughout an anticipated electricity supply shortfall event in the CAISO balancing area. It also describes contingency resources that can support the grid during an anticipated shortfall, including additional generation and load reduction measures. The Contingency Plan also describes the roles and responsibilities of each institution to identify and pursue contingency resources, as well as the triggers associated with engaging each resource.

This Contingency Plan applies in the event of a possible shortfall in electricity supply within the CAISO balancing authority due to events that occur within or outside the CAISO balancing authority area. This Contingency Plan does not address localized events, such as public safety power shutoffs or supply shortfalls in other balancing authority areas.

SECTION 2: Contingency Coordination

CAISO, CEC, and CPUC, under the leadership of the Governor's Office, have established principal-level and technical-level teams that coordinate regularly during summer months and with increasing frequency leading up to and during a potential electricity shortfall event.

Principal Team: The principals include senior leadership from each institution in coordination with the Governor's Office, including:

- President and Chief Executive Officer, CAISO
- Chair, CEC
- President, CPUC

The Principal Team meets weekly during summer months and reviews upcoming grid conditions, status of resource procurement programs and determines whether more frequent coordination is necessary within the week. Within four days of the identification of a potential electricity shortfall event, the Governor's Office Task Force is triggered, and the Principals are in constant communication to share information and provide direction to the Technical Team.

Technical Team: The Technical Team has representation from senior levels in each institution able to direct technical staff to pursue contingency resources. The team members participate in Principal Team meetings and meet, as necessary, following Principal Team meetings to coordinate on addressing actions identified in the Principal Team meetings. The Technical Team members or their designees reach out to contingency resource providers during an event to identify their ability to support grid reliability and quantify the potential support. The members also track potential capacity that a generation or load reduction resource can provide. The Technical Team members are responsible for updating their Principal Team representatives during an event.

SECTION 3: Roles and Responsibilities

CAISO

The CAISO is the balancing authority for 80% of the load in California and a small portion of Nevada. Subject to a federally approved tariff, the CAISO operates wholesale energy and ancillary services markets to balance electric supply and demand and ensure reliable operation of the transmission system. The CAISO is responsible for identifying potential events that may lead to a shortfall and triggers activation of the Contingency Plan which initiates a time sequence of events as described in Section 5.

When electricity supplies get tight, the CAISO uses a series of notifications to inform market participants and the public of potential energy shortages. The CAISO's Alerts, Warnings, and Emergency (AWE) messages announce escalation of adverse grid or market conditions.

The North American Reliability Corp. (NERC) developed a separate set of alert designations, the Energy Emergency Alert (EEA). EEAs are issued by the Reliability Coordinator, RC West, for any balancing authorities in its RC area. The CAISO AWE and RC West EEA designations have different numbers for the phases of an emergency. The CAISO is planning to align its designations to match the EEAs, in an effort to be consistent with the alerts used by RC West and other balancing authorities in WECC.

AWE Notifications



Flex Alerts

A Flex Alert is a call to consumers to voluntarily conserve electricity when the CAISO anticipates using nearly all available resources to meet demand. Reducing energy use during a Flex Alert can prevent more dire measures, such as moving into AWE notifications, emergency procedures, and even rotating power outages.



Restricted Maintenance Operations

High loads are anticipated. CAISO participants are cautioned to avoid taking grid assets offline for routine maintenance, to ensure that all generators and transmission lines are available.



Alert

All available resources are online, and resource deficiencies are expected. Market participants are encouraged to offer supplemental energy. Issued by 3 p.m. the day before projected shortfall. RC West issues EEA watch.



Warning

Market participants are encouraged to offer supplemental energy and RC West issues EEA-1. CAISO may call for demand response, and when demand response is dispatched, RC West issues EEA-2.



Transmission Emergency

Declared for any event threatening or limiting transmission grid capability, including line or transformer overloads or loss.



Stage 1 Emergency

CAISO requests certain market participants to voluntarily reduce energy use. RC West issues EEA-2.



Stage 2 Emergency

CAISO calls for utilities to voluntarily interrupt loads where possible. Requests maximum conservation.



1-Hour Notification

CAISO may initiate rotating outages within an hour. RC West issues EEA-3.



Stage 3 Emergency

Controlled power curtailments are imminent or in progress. CAISO calls for out-of-market and emergency energy from all available sources.

The CAISO has direct communication with each wholesale electricity market participant's Scheduling Coordinator. A Scheduling Coordinator is the legal entity that represents the market participant and provides bids for supply resources or demand into the CAISO market.

The CAISO's communications pathways include, but are not limited to:

1. Broad and public outreach via:
 - a. Initiating and ending the Heat Bulletin
 - b. Initiating and ending Flex Alerts
 - c. Initiating and ending Alerts, Warnings, and Emergencies and Emergency Alerts
2. Direct outreach to Scheduling Coordinators participating in the CAISO wholesale markets, including the Western Energy Imbalance Market.
3. Direct outreach to CAISO interconnected generators.
4. Direct outreach to state agencies and governmental entities for informational updates and coordination.

The CAISO's contingency-related actions include, but are not limited to:

1. Initiating public notifications to communicate potential, imminent, and in-progress grid emergencies.
2. Requesting additional resources from Scheduling Coordinators.
4. Assessing the feasibility of resources providing emergency energy above their approved generator interconnection agreement net MW at the point of interconnection.
5. Activate CAISO operating procedure 4420.²

² California Independent System Operator System Emergency Procedure Number 4420, June 15, 2021

CEC

As the state's primary energy policy and planning agency, the CEC supports emergency response efforts by serving as a central source of credible and timely information on emergency impacts to the state's energy infrastructure. Support activities include planning for shortages and major events affecting the availability of electricity, natural gas, and petroleum fuels; assisting local governments with energy resiliency planning; and encouraging load reduction to reduce energy demand. With respect to CAISO reliability, the CEC provides relevant analytics to prepare for summer reliability, including the demand forecast, and coordinates with key federal and state agencies, jurisdictional generators, and large end-users before, during, and after an event.

The CEC develops annual demand forecasts, which are used by the CPUC for resource planning proceedings, including the Resource Adequacy program. The CEC also now develops annual summer reliability analyses that evaluate anticipated supply against anticipated demand. These analyses help inform the state on potential summer reliability issues.

The CEC coordinates with multiple government and private sector entities, as necessary, to enable greater power production or load reduction during emergency events. The CEC leverages existing relationships with jurisdictional generators, in close coordination with CAISO, identifying facilities that are able to increase power output with or without permit relief. The CEC supports the Governor's Office on emergency declarations necessary to enable additional temporary generation through permit relief to prevent grid instability. Furthermore, the CEC works with other major governmental and private sector electricity users, such as the United States military, the California Department of General Services, and major commercial and industrial customers to identify potential load reduction opportunities.

CPUC

The CPUC regulates investor-owned utilities. It oversees the Resource Adequacy program, which has the goal to ensure reliable electric service by requiring CPUC-jurisdictional load serving entities, including investor owned utilities, community choice aggregators and electric service providers have capacity procured and made available when and where it's needed by the CAISO. The CPUC also oversees multiple programs that provide demand-side resources that can either reduce demand or provide additional energy during contingency events.

The CPUC's communications pathways include, but are not limited to:

1. Broad, public outreach and amplification of the CAISO's and Flex Alert's messages on Twitter, Instagram, Facebook, and LinkedIn, including the CAISO's Heat Bulletin and Alerts, Warnings, and Emergency Alerts.
2. Independent messages pushed out via social media and media outreach, as appropriate.
3. Direct outreach to state agencies and governmental entities for informational updates and coordination.
4. Direct outreach to IOUs to ensure consistency of messaging and amplification of messaging. The IOUs have the best direct path to communications with their customers.

The CPUC's contingency-related actions include, but are not limited to:

1. Amplifying the CAISO's messages initiating public notifications to communicate potential, imminent, and in-progress grid emergencies.
2. Amplifying voluntary conservation messages via Flex Alerts and coordination with IOUs and program providers to do the same.
3. Coordination with IOUs and program providers in advance of potential grid emergencies to ensure they are prepared to implement emergency load reduction programs in the event that they are triggered and to ensure amplification of messaging.
4. Other actions as appropriate and in coordination with the Governor's Office, CAISO, and CEC.

SECTION 4: Contingency Resource Types

The three energy institutions have coordinated on identifying potential additional resources that can be called upon in the event of a potential electricity supply shortfall. These resources are above and beyond those routinely available as supply.

Within days of a potential electricity supply shortfall event, the following contingency resources have been identified to be called upon to mitigate a supply shortfall:

- **Voluntary Customer Conservation** – Californians have shown that they are willing to voluntarily reduce their energy use during critical periods. This can be a low-cost and low greenhouse gas emission option to support the grid. To initiate voluntary conservation, the CAISO issues Flex Alerts in advance of a potential shortage. The alerts provide advice for customers to make the most impactful reductions and can include increasing thermostat temperatures, avoiding the use of major appliances, and turning off unnecessary lights. CAISO initiates the alerts, which are further broadcast by the CEC and CPUC. While a statewide Flex Alert program has been unfunded in recent years, the CPUC has funded a 2-year \$24 million campaign to educate customers about the positive impacts of electricity conservation and inform them of when electricity demand is high and conservation is needed.
- **Additional Generation and Load Reductions** – In addition to voluntary conservation from customers, there are other potential generation sources and load reductions that the state can draw on, typically from larger customers who are not already participating in demand response programs. An example partner is the California Department of Water Resources (DWR) operator of the State Water Project (SWP), a system of water storage facilities, pumping and generating plants, and pipeline and canal infrastructure that delivers water throughout the state. Through DWR operational controls, the SWP can offer CAISO additional electric generation and load reduction during peak periods with sufficient notice. CAISO and CEC coordinate with DWR to make additional generation and load reduction available, as needed. However, for summer 2021, DWR has identified that drought conditions have severely limited their ability to provide additional support during a contingency event.

The CEC, in coordination with the Governor's Office, has developed a network to reach other major end users to identify potential load reduction. This network includes large state government users (e.g. Department of General Services, the University of California system) and large commercial, retail, and industrial customers. In the event of an energy emergency, the CEC coordinates with the Governor's Office to identify and request reductions available from this network.

- **Emergency Load Reduction Program (ELRP)** – The CPUC’s ELRP provides compensation for certain customers that provide additional load reduction during an energy emergency.³ This program is being piloted in 2021 and 2022, after which the CPUC will determine whether the program should continue. The CAISO and CEC coordinate with the IOUs to track potentially available load reductions under this program before and during an emergency event.
- **Imports from Other California Balancing Authorities** – Non-CAISO balancing authorities in the state can potentially provide additional available generation as imports to the CAISO territory, as they did during the 2020 heatwave. Prior to an emergency (*i.e.*, during the planning stage), the CAISO and CEC coordinate with partner balancing authorities to alert them of a need and track available generation that they can provide. During an emergency, the CAISO as the balancing authority will coordinate with other balancing authorities directly.
- **Additional Thermal Generation** – Some thermal power plants may have the ability to generate additional capacity beyond permit limits/restrictions in an emergency. Realizing additional generation is not a certainty and depends on a variety of factors and conditions at each individual facility. Some generators may also be able to generate additional capacity beyond their interconnection limitations. In emergency circumstances, temporary permit relief can be achieved through a Governor’s Emergency Order or through an Emergency Order from the U.S. Department of Energy. CEC and CAISO coordinate on identifying where actions such as an emergency order would enable additional generation.

The CAISO may be able to use its backstop authority either prior to or during the operational timeframe. The CAISO tariff provides for a capacity procurement mechanism (CPM) pursuant to manually identifying additional resources or due to a “significant event,” such as a substantial event, or a combination of events, that is determined by the CAISO to either result in a material difference from what was assumed in the resource adequacy program, or produce a material change in system conditions that causes, or threatens to cause, a failure to meet reliability criteria.

³ CPUC Decision 21-03-056, March 25, 2021 Decision Directing Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company to Take Actions To Prepare For Potential Extreme Weather In The Summers Of 2021 And 2022

SECTION 5:

Contingency Plan Timeline & Actions

Actions taken in this Contingency Plan are triggered by stages of alerts provided by CAISO. Alerts can be made as early as seven calendar days in advance of a potential event. CAISO, CEC, and CPUC will take advantage of this early notice to alert relevant contingency resources about a potential request. Triggers at three to four calendar days and one calendar day before a potential event require expanded outreach to identify and request contingency resources.

Up to 7 Calendar Days Out

CAISO will create an alert up to seven days in advance of a potential event. This early window allows the CAISO and CEC to begin engagement with contingency resources to prepare them in the event action is requested closer to a potential event.

CAISO: If the CAISO determines there is a potential event, up to 7 days prior to the event, the CAISO will:

- Notify the CEC's Emergency Coordinator and the CPUC's Deputy Executive Director for Energy and Climate Policy.
- Publicly communicate the potential event via a "heat bulletin."

Communication will include details such as type of event, expected impact or duration, and other information as available and appropriate. Broad and public communication includes messaging to market participants and public messaging via CAISO's normal communications platforms such as news releases, Today's Outlook on the CAISO website and the mobile app, market notices, website alerts, notifications on Twitter, and other electronic and verbal communication to the public at large. To ensure communication is disseminated as broadly as possible, the CAISO will attempt to announce the potential event on a non-holiday weekday.

The CAISO will provide regular updates on the potential event. If appropriate, the CAISO will reach out to coordinate with entities such as SWP and other Balancing Authorities. If the CAISO determines that the event will not materialize, the CAISO will broadly and publicly communicate this, including outreach to the state agencies.

CEC: The CEC will ensure CEC-jurisdictional generators and major electricity users are aware of the CAISO alert and prepare to engage them, as necessary.

CPUC: The CPUC will initiate internal safety alert system protocols. In coordination with the CEC, CAISO, Governor's Office, and the IOUs, the CPUC will reach out to large customers who cannot or choose not to participate in IOU load reduction programs, but who may be able to shed load with advanced warning, in order to gauge load reduction potential in the event it becomes necessary.

3 to 4 Calendar Days Out

As the probability of an event increases, the Technical Team will increase outreach to contingency providers and quantify potential contingency resources. Contingency resource owners require time to evaluate their ability to provide resources, quantify the potential capacity, and prepare operations to provide them during the event. Engagement three to four days in advance of the event provides them sufficient time to assess their capacity to support grid operations.

CEC, CAISO, and CPUC: The Principal and Technical Teams will remain in constant communication to ensure review of grid status and the potential need for contingency resources, coordinate outreach, and to combine information on potential capacity that can be made available.

CAISO: The CAISO will initiate outreach to Scheduling Coordinators to request any additional resources to bid into the CAISO wholesale electricity market to address the potential event. This outreach will include other California balancing authorities, including those participating in the Western Energy Imbalance Market. The estimated scope of additional resources may not be known for a few days. However, the CAISO endeavors to track additional resource estimates for reporting and tracking purposes so that CAISO operations will be able to utilize as much additional capacity as possible. To ensure Scheduling Coordinators can act upon CAISO requests, the CAISO will attempt to conduct outreach on a non-holiday weekday.

CEC: The CEC will reach out to major electricity users to identify potential load reduction and to coordinate with other state agencies and the Governor's Office to prepare an emergency order, if necessary, to enable additional generating capacity to be bid into the CAISO market, as available.

CPUC: The CPUC will update their internal safety alert system notification. In coordination with IOUs, the CPUC will engage with large customers who cannot or choose not to participate in IOU load reduction programs, but who may be able to shed load with advanced warning, to prepare for load drop in the event it becomes necessary.

1 Calendar Day Out

The CAISO, CEC, and CPUC will be in constant communication to share updates on available resources and anticipated demand to fully anticipate grid conditions.

CAISO: The CAISO will operate regular market processes and emergency procedures, such as:

- Calling a Flex Alert (up to 24 hours prior to when conservation measures may be needed)
- Messaging to consumers of potential outages
- Running the day-ahead market
- Call a Grid Alert in the day-ahead timeframe in anticipation of operating reserve deficiencies

CAISO: The CAISO will confirm additional support from SWP, generation from other balancing authorities, and potential support from the ELRP through the IOUs.

CEC: The CEC will communicate with jurisdictional generators to inform them that an energy emergency has been declared, provide information about any emergency waivers or emission limit waivers that have been issued by the Governor's Office or by the U.S. Department of Energy, request that they closely coordinate with CAISO to bid additional capacity into the market, report any facility challenges to support the request, and contact the CEC if they need assistance. The CEC will also maintain a master list of potential generation and load reduction resources in case of an event.

CPUC: The CPUC will update the internal safety alert system notification. In coordination with CEC, CAISO, Governor's Office, and IOUs, the CPUC will alert large customers who cannot or choose not to participate in IOU load reduction programs, but who have indicated an ability to shed load with advanced warning, to prepare for load drop in the event it becomes necessary.

Day of Event

The CAISO, CEC, and CPUC will be in continuous communication to share updates on available resources and respond to grid conditions.

CAISO: The CAISO will implement existing operating procedures and any emergency dispatches authorized.

CEC: The CEC will update and maintain a master list of additional generation and load reductions.

CPUC: The CPUC will update their internal safety alert system notification. In coordination with the CEC, CAISO, Governor's Office, and IOUs, the CPUC will request that large customers who cannot or choose not to participate in IOU load reduction programs, but who have indicated an ability to drop load with advanced warning, to shed load as necessary.

Post Event

Whether it reaches the point of needing contingencies or not, valuable lessons can be learned and should be incorporated into this Contingency Plan. After each event, the CAISO, CEC, and CPUC will hold an after-action meeting to review lessons learned, which will then be incorporated into this Contingency Plan.