SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead®

CAISO ROTATING OUTAGES

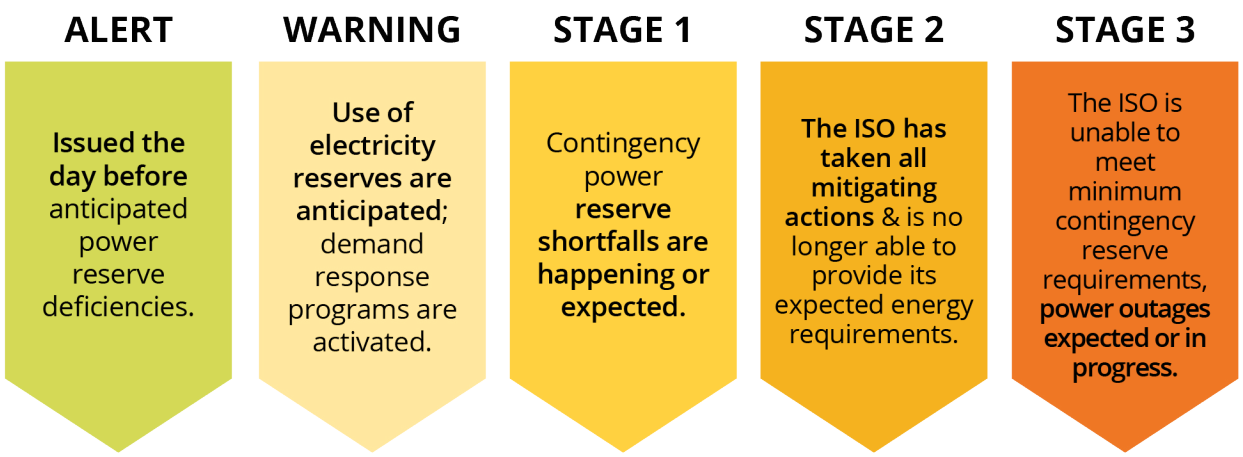
The California Independent System Operator (CAISO) manages the California electric grid and the energy market for 80% of the state of California. It is responsible for coordinating and ensuring the supply of power across the state used by the state's three investor owned utilities (IOUs), including Southern California Edison. Typically, by managing contracts with power producers both in and out of California, there is enough energy to meet California's needs. Using weather reporting and modeling, CAISO provides look ahead forecasts that typically allows it to predict and cover any anticipated peak loads.

Electricity must be supplied on demand. Other than very limited energy storage across the state, the lead time from when power is generated to when it hits air conditioners and light switches is almost instantaneous. A failure to supply electricity when it is demanded by the system could lead to major power outages, which can disrupt communities, businesses and lives; endanger public safety; and damage electrical infrastructure, slowing restoration. The CAISO will take a number of preventative steps, with rotating outages being the last, in order to avoid a widespread blackout.

THE STAGES OF A CAISO EMERGENCY

When CAISO anticipates that demand is going to outpace available supply, it will call a statewide emergency. Rotating outages are the last stage of a CAISO emergency. Other steps include alerting and warning utilities, triggering demand response programs that require participating customers to reduce their energy use, and calling on business customers to provide backup generation (see diagram, below). It can also ask customers to conserve energy by calling a statewide Flex Alert. If these prevention steps do not reduce enough demand or add enough additional sources of generation, a Stage 3 emergency allows CAISO to order the utilities to turn off service immediately through rotating outages. Given the immediacy of power generation, the time between the three stages of emergencies can be minimal. And after Stage 3 is called, SCE may have as few as 10 minutes before starting rotating outages.

CAISO SYSTEM ALERTS, WARNINGS AND EMERGENCIES



Source: CAISO System Alerts, Warnings and Emergencies.
Available: http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf (accessed September 3, 2020.)

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HOW CAISO ROTATING OUTAGES ARE MANAGED

Every customer has a rotating outage number on their bill in the event of CAISO rotating outages. This number corresponds to a group, which includes 20,000 to 30,000 customers and represents approximately 100 megawatts of energy usage. The groups are purposely geographically dispersed across SCE's service territory so that no one community would lose all its power in the event of a CAISO rotating outage. The groups are updated and reviewed annually to ensure that they continue to have the right number of megawatts of power and that circuits including public safety providers or other emergency operations are removed.

Several groups could be called at a time, depending on the amount of the energy shortfall. CAISO rotating outages typically last one hour. If the emergency continues longer than that, new groups of customers are shut down. Once a group has participated in a CAISO rotating outage, it is moved to the bottom of the outage list and will not be called again until the entire list has been cycled through.

EXEMPT AND NON- EXEMPT CUSTOMERS

- Certain customers who provide essential public health, safety, and security services (Essential Use Customers) are typically exempt from rotating outages. The list of categories of Essential Use Customers can be found at sce.com/rotatingoutage.
- Critical care customers (those who cannot be without electric service for more than two hours) are not excluded from rotating outages. These customers are typically prepared for potential outages and other emergencies, including having backup generators. They are also notified in advance of any outage, regardless of the amount of lead time that we have for the outage
- Community Choice Aggregators (CCA) are also subject to rotating outages since their electricity is supplied through the SCE electric grid.

HOW TO FIND A CAISO ROTATING OUTAGE GROUP NUMBER

Customers can find their CAISO Rotating Outage Group Number by:

- Logging in to My Account on sce.com and following the step-by-step guide
- Locating the number printed on the front of each month's printed bill
- Calling SCE Customer Service at 1-800-611-1911
- Searching neighborhood rotating outage maps at sce.com/rotatingoutage

Customers' CAISO rotating outage group numbers are treated as confidential information to protect privacy and safety.

For more information on CAISO rotating outages visit caiso.com
For more information on SCE's response to rotating outages, visit sce.com/rotatingoutage

AUGUST 14-15, 2020 CAISO STAGE 3 EMERGENCY EVENT

In response to one of the strongest West Coast heat waves on record, CAISO directed the utilities to implement rotating outages for the first time in 19 years. The state is conducting a thorough investigation into the causes, but known factors causing the shortage of electricity supply included the heat wave, lower levels of wind generation, unexpected natural gas generation losses, and lowered availability of electricity imports from out of state.

To prevent and reduce the outages, IOU customers reduced use through conservation and provided energy to the grid through self-generation programs. SCE managed 70 demand response programs dispatched across six consecutive days, while large business customers turned on their backup generators. Collectively, customers reduced the peak in SCE's service area by more 1,200 megawatts of energy. With these efforts, and many customers stepping up to conserve, further rotating outages were avoided.

PREVENTING FUTURE CAISO ROTATING OUTAGES

With climate change, more intense and longer heat waves are expected in the coming decades. SCE and the state have noted the need for more generation capacity since long before the August 2020 rotating outage event. Market rules need to adjust so we can transition responsibly to a low-carbon grid. Energy storage is the only way to store power for later, but we do not have nearly enough energy storage in California today to make a significant difference in energy emergencies. The California Public Utilities Commission recently approved SCE's proposal to procure 770 megawatts of battery-based energy storage resources. While these additional resources will enhance electric grid reliability and help address current potential energy shortfalls identified in the state, SCE's Pathway 2045 vision suggests that California needs 30,000 MW of utility-scale energy storage to manage an additional 80,000 MW of utility-scale clean generation. Distributed energy will also grow significantly, with 50 percent of rooftops projected to have solar along with another 10,000 MW of customer-sited storage.

As the climate crisis continues to unfold, we must continue to transition to a clean energy economy. As our response to the August 2020 CAISO emergency demonstrates, we can band together across the state to find collective solutions—demonstrating generosity, resolve and initiative.