

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

SAFETY AND ENFORCEMENT DIVISION
Electric Safety and Reliability Branch

July 11, 2024
RESOLUTION ESRB-11

RESOLUTION**RESOLUTION ESRB-11 - MODIFIES THE APPLICABILITY OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION'S GENERAL ORDER 174, RULES FOR ELECTRIC UTILITY SUBSTATIONS**

OUTCOME: Modifies General Order (GO) 174 to make it applicable to all jurisdictional substations regardless of whether they are subject to the California Independent System Operator's (CAISO) operational control and/or subject to the Federal Energy Regulatory Commission's (FERC) reliability standards, and updates the Division's responsible to receive annual GO 174 reports.

SAFETY CONSIDERATIONS: Will improve the safety and reliability of California electric substations facilities.

ESTIMATED COST: No significant cost.

SUMMARY

The California Public Utilities Commission's (CPUC or Commission) General Order (GO) 174 requires all jurisdictional utilities, both publicly and investor-owned, to adopt and implement safety rules and inspection practices for electric substations. Substations subject to the CAISO's operational control and/or subject to FERC reliability standards are excluded from the GO 174 requirements. FERC is an independent federal agency that regulates the interstate transmission of electricity, natural gas, and oil. CAISO is regulated by FERC and it is a nonprofit public benefit corporation that manages the flow of electricity across the high-voltage, long-distance power lines, for the electric power grid serving 80 percent of California and a small part of Nevada.

The primary guiding principle of CAISO's Planning Standards is to develop consistent reliability standards for the CAISO grid that will maintain or improve transmission system reliability to a level appropriate for the California system.¹ Currently, there are

¹ [CAISO Planning Standards, https://www.aiso.com/Documents/ISO-Planning-Standards-Effective-Feb22023.pdf](https://www.aiso.com/Documents/ISO-Planning-Standards-Effective-Feb22023.pdf)

over 80 mandatory reliability standards in effect that address many aspects of the reliable operation of the nation's electric grid.

This Resolution modifies the requirements of GO 174 to include those substations that are also subject to CAISO operational control and/or FERC jurisdiction.

BACKGROUND OF GO 174

On December 20, 2003, a fire occurred within a PG&E substation which caused a power outage to more than 100,000 customers in San Francisco, including downtown retail stores filled with shoppers on the peak holiday shopping weekend. On March 17, 2005, the Commission opened Investigation (I.) 05-03-001 Into the Operations and Practices of PG&E for the December 20, 2003 PG&E Mission Substation Fire and Electric Outage Pursuant to Public Utilities Code Section 451. During the investigation, it was discovered that a similar incident occurred in PG&E's system in 1996. Both fires had similar contributing factors and root causes. This investigation delved into PG&E's operations and practices to determine the causes and ramifications of the PG&E Mission Substation Fire and Electric Outage that occurred on December 20, 2003. The Commission also issued an order to show cause, compelling PG&E to justify why fines and sanctions should not be imposed in accordance with Public Utilities Code (PUC) Section 451.

Commission Decision (D.) 06-02-003 resolved I.05-03-001 and approved a settlement agreement between the Consumer Protection and Safety Division (CPSD), now the Safety and Enforcement Division (SED), PG&E, and the City and County of San Francisco. Furthermore, D.06-02-003 directed CPSD to formulate a comprehensive inspection practices program for electric substations that would be applicable not only to PG&E but encompass all utilities regulated by the Commission. The decision also obligated PG&E to remit \$500,000 to CPSD for the establishment, training, and execution of an audit program focused on utility substation inspections.

To fulfill part of the settlement agreement, on September 8, 2010, the Commission issued Order Instituting Rulemaking (R.) 10-09-001, *Order Instituting Rulemaking to Implement Commission Regulations Relating to Safety of Electric Substations*. For a year prior to the official proceeding, SED worked with a collection of stakeholders, including the investor-owned utilities, Los Angeles Department of Water & Power (LADWP), the California Municipal Utilities Association (CMUA) and the International Brotherhood of Electrical Workers Union (IBEW), to develop consensus on a draft general order for substation safety and inspection practices. After deliberations, the stakeholders reached a consensus and circulated a draft of GO 174 for comments during the formal rulemaking.

On October 25, 2012, the Commission issued D.12-10-029, which approved and adopted GO 174 "Rules for Electric Utility Substations." The decision found that the Commission

has safety jurisdiction over both investor-owned and publicly-owned utilities and ordered these utilities to adopt and implement safety rules and inspection programs for electric substations. Ordering Paragraph 2 of the decision also required the utilities to meet annually to compare their practices and develop a “best practice” for safety rules and inspections of substation facilities. The Commission further ordered SED to attend these conferences and report on the results of the conferences as well as utility compliance with GO 174. GO 174 imposes the following requirements on electric substations:

- Requires utilities to design, construct and maintain substations per accepted good practice, for their intended use, and in a manner that promotes safety and adequacy of service.
- Requires utilities to develop and implement inspection practices which specify inspection activities, inspection frequencies, and record-keeping and data retention policies.

GO 174 however does not set specific rules for designing, constructing, maintaining, or inspecting substations. Instead, GO 174 requires the utilities to develop their own maintenance plans and to inspect their substations as frequently as necessary, and in a manner that promotes the safety and adequacy of service.

Rule 11 of GO 174 exempts substations under the operational control of CAISO or subject to FERC reliability standards. Such substations are those rated at a voltage of 100 kV or higher.

FERC and CAISO Standards Applicable to Substations

FERC’s reliability jurisdiction is primarily over what is known as the “Bulk Electric System (BES).” All transmission elements operated at 100 kV or higher and real power and reactive power resources connected at 100 kV or higher are referred to as BES. This does not include facilities used in the local distribution of electric energy.²

To maintain the reliability of the bulk power system, FERC reviews, approves, and enforces mandatory reliability standards through an organization called the North American Electric Reliability Corporation (NERC). The Western Electricity Coordinating Council (WECC) has delegated authority to enforce and administer NERC standards for the western states’ region, including California.

Transmission substations are subject to WECC reliability standards for 100kV facilities or higher voltage, with some exclusions. Responsible entities are required to submit and

² [BES Reference Doc 08_08_2018_Clean_for_Posting.pdf \(nerc.com\)](#)

comply with a Transmission Maintenance and Inspection Program.³ These standards operate in parallel with the Commission's safety oversight authority and do not preempt California's substation safety standards.

JUSTIFICATION

As a part of an electric safety program that is unique to California, the Commission has established specific, uniform safety requirements and rules that all electric utilities in California must abide by and follow.

SED is the division tasked with ensuring that electric utilities design, construct, operate, and maintain their facilities in accordance with all the electric facilities' safety rules adopted by the Commission. In order to accomplish this, SED performs proactive inspection audits of all electric utilities to ensure compliance with General Orders (GOs) 95, 128, 165, and 174. Among many things, SED performs electric distribution audits, electric transmission audits, and substation audits of all jurisdictional entities. The electric distribution and transmission audits are performed to determine compliance with the Commission's GOs 95, 128, and 165, and substation audits—which are performed only on substations containing facilities that operate at a voltage less than 100 kV—to determine compliance with the Commission's GO 174. In addition to audits, investor-owned utilities are required to report incidents that meet certain criteria to the Commission. SED investigates all such reportable incidents and customer safety complaints to determine whether the electric utility violated any of the Commission's General Orders or Public Utilities Code. (See, for example, D.06-04-055, Appendix B) The Commission's reportable incident criteria are based on factors/requirements unrelated to voltage level or the facility's location (i.e. whether in a substation or on a pole). SED investigates all such incidents for compliance with the Commission GOs, however, for incidents related to facilities operating at 100 kV or more and in substations, there is currently no general order that is applicable to these facilities.

The Commission's electric safety program, administered by SED, is designed to ensure that the utilities comply with all applicable safety and reliability rules in order to provide safe and reliable electric service. Electric utilities that own or operate underground or overhead electric facilities are required to comply with the requirements GOs 95, 128, and 165 regardless of the voltage of such facilities or whether the facilities are subject to CAISO's operational control and/or FERC reliability standards. However, the same does not apply for substations with facilities operating at 100 kV or more. Under the current rules of GO 174, substations with facilities operating at 100 kV or more are excluded from the safety requirements of GO 174.

³ For example, WECC Reliability Standard PRC-STD-005-1.

The exemption for these facilities and equipment from GO 174 requirements creates a blind spot within the Commission's otherwise comprehensive safety oversight and hinders SED's ability to determine whether the utilities are maintaining and operating all substations safely and in a manner that protects the public and its employees and provides reliable service. This gap in oversight also obligates SED to apply different safety and reliability standards to substations with facilities operating at 100 kV or more when assessing the safety and reliability of these facilities during incident investigations.

The Commission has jurisdiction over all substations regardless of the voltage of the facilities at the substations. The Commission's safety rules and requirements for substations, as codified in GO 174, should simply apply to all substations, regardless of voltage or otherwise subject to NERC/WECC requirements. Removing the current exemption for FERC jurisdictional or CAISO-controlled facilities would be consistent with the Commission's authority to enforce the safety requirements of GOs 95, 128, and 165 across all facilities irrespective of the electric facilities' voltage.

A clear example of this contradictory enforcement authority occurred during the Pacific Gas and Electric Company (PG&E) Metcalf substation incident. On August 26 – 27, 2014, an incident occurred at PG&E's Metcalf substation which contains facilities operating at a voltage higher than 100 kV. SED investigated the incident and determined that PG&E's conduct and behavior was unsafe as it related to its maintenance and operation of the substation. Despite these findings, SED could not apply GO 174 to this incident to ensure that PG&E operated and maintained its substation in a safe and reliable manner because the substation contained electric facilities operating at a voltage over 100 kV. Instead, SED had to pursue safety enforcement under California Public Utilities Code (PUC) Section 451 by demonstrating that PG&E's behavior and conduct was not safe or in accordance with good, accepted standards. Had the Metcalf substation been subject to GO 174, SED would have been able to directly apply the rules of GO 174 to determine that PG&E did not maintain and operate the substation in a safe manner, which would have resulted in at least two violations of GO 174 (Rules 12 and 30). Furthermore, if GO 174 was applicable to the Metcalf substation, SED would have been able to include such substations in its substation audit program and inspect this substation on a regular basis. SED's routine audit of the substation and inspections could have identified PG&E's unsafe practices, and thus, required PG&E to implement measures to correct these unsafe practices, which could have prevented such an incident.

The Commission's current safety and enforcement program as it relates to substations represents a gap in regulation where it does not apply reliability and safety standards equally across the electric utilities. This gap has consequences.

Between 2000 and 2023, a total of 59 equipment failure incidents occurred at substations containing facilities operating at 100 kV or above. SED is required to investigate all

incidents related to substations regardless of the voltage of the facilities in the substation. However, because these substations are excluded from GO 174, SED must refer to other publications and guidelines (such as FERC standards or good utility utilities safe practices) to determine whether these substations are operated and maintained properly. Moreover, if GO 174 applied to these substations, SED would have been able to include these facilities in its routine audits and inspections program which could have identified any improper or unsafe maintenance policies by the utilities operating these substations. The results of SED's audits and inspections would have required the utilities to implement corrective measures that could have prevented the aforementioned incidents from occurring. However, SED's inability to audit and inspect substations containing facilities operating at 100 kV or more, is directly related to the current gap in the Commission's safety rules that determine compliance for these facilities for all other substations. Applying GO 174 to all substations, regardless of the voltage of the facilities in these substations, would remedy this significant gap in the Commission's oversight and administration of electric system safety rules and SED's enforcement authority. Making GO 174 applicable to all substations will play a pivotal role in promoting the safety and reliability of these facilities and help to minimize incidents.

This resolution will not affect compliance with FERC and CAISO requirements, nor conflict with the enforcement of GO 174 on substations that are subject to the CAISO's operational control and/or FERC's reliability standards, as the rules in GO 174 do not conflict with any of the requirements of FERC or CAISO. GO 174 is a performance-based rule, and therefore not composed of a "detailed list" of prescriptive maintenance and inspection requirements for all substation facilities. GO 174 presents basic requirements for a robust enforcement program based on accepted good practices throughout the utility industry. The only change that would result from this resolution is the authority of SED to audit and inspect substations containing facilities operating at 100 kV for compliance with GO 174, just as SED audits and inspects all overhead and underground electric facilities for compliance with GOs 95, 128, and 165, regardless of the voltage of these electric facilities.

COMMENTS ON DRAFT RESOLUTION

A draft Resolution was distributed for comment pursuant to Commission Rule of Practice and Procedure 14.5 on June 7, 2024. Comments were received from _____.

FINDINGS

1. Rule 11 of General Order 174 exempts substations under operational control of the California Independent System Operator (CAISO), or subject to Federal Energy Regulatory Commission (FERC) reliability standards.

2. This resolution will extend the jurisdiction of General Order 174 to include all substations regardless of the operating voltage of facilities, including substations that are currently under the operational control of CAISO or those subject to FERC reliability standards.
3. This resolution will also modify the name of the CPUC division responsible for receiving the GO 174 annual reports.

IT IS ORDERED:

General Order 174 be modified as shown in Appendix A to this Resolution. I certify that this Resolution was duly introduced, passed, and adopted by the Public Utilities Commission of the State of California at its regular business meeting held on July 11, 2024 and the following Commissioners approved favorably thereon:

Rachel Peterson
Executive Director

APPENDIX A

Current Rules:

11 **Applicability**

This General Order applies to electric utilities subject to the jurisdiction of the California Public Utilities Commission (Commission).

Facilities subject to the California Independent System Operator's operational control and/or subject to FERC reliability standards and Customer Substations are exempt from this General Order.

40 **Annual Filings**

40.1 No later than July 1st of each year, each Operator shall transmit to the Utilities Safety and Reliability Branch (USRB) an Inspection Program Summary.

Changes to the Inspection Program shall be reflected in the Inspection Program Summary, including the effective date of the change. Should no changes occur since the previous filing, the Operator shall transmit written correspondence confirming that no changes were made to the Program.

40.2 No later than July 1st of each year, each Operator shall transmit to the CPSD a report summarizing completed and past due Inspections for the prior calendar year.

Proposed Rules (Strikeout and Underline):

11 **Applicability**

This General Order applies to electric utilities subject to the jurisdiction of the California Public Utilities Commission (Commission).

~~Facilities subject to the California Independent System Operator's operational control and/or subject to FERC reliability standards and~~ Customer Substations are exempt from this General Order.

40 Annual Filings

- 40.1 No later than July 1st of each year, each Operator shall transmit to ~~the Utilities Safety and Reliability Branch (USRB)~~ the Safety and Enforcement Division (SED) or its successor, an Inspection Program Summary.

Changes to the Inspection Program shall be reflected in the Inspection Program Summary, including the effective date of the change. Should no changes occur since the previous filing, the Operator shall transmit written correspondence confirming that no changes were made to the Program.

- 40.2 No later than July 1st of each year, each Operator shall transmit to ~~the CPD~~ the Safety and Enforcement Division (SED) or its successor a report summarizing completed and past due Inspections for the prior calendar year.

*Final Rules:***11 Applicability**

This General Order applies to electric utilities subject to the jurisdiction of the California Public Utilities Commission (Commission).

Customer Substations are exempt from this General Order.

40 Annual Filings

- 40.1 No later than July 1st of each year, each Operator shall transmit to the Safety and Enforcement Division (SED) or its successor, an Inspection Program Summary.

Changes to the Inspection Program shall be reflected in the Inspection Program Summary, including the effective date of the change. Should no changes occur since the previous filing, the Operator shall transmit written correspondence confirming that no changes were made to the Program.

- 40.2 No later than July 1st of each year, each Operator shall transmit to the Safety and Enforcement Division (SED) or its successor a report summarizing completed and past due Inspections for the prior calendar year.

(END OF APPENDIX A)