R.18-04-019: Workshop on Climate Adaptation and General Orders

April 17, 2025

California Public Utilities Commission

Welcome and Opening Remarks

Commissioner Darcie L. Houck

Agenda

Topic	Speaker	Time
I. Welcome and Opening Remarks	Commissioner Houck	9:00 to 9:15 a.m.
II. Background and Purpose	Junaid Rahman (CPUC)	9:15 to 9:20 a.m.
III. California Climate Adaptation Landscape	Sara Moore (CPUC)	9:20 to 9:30 a.m.
IV. OEIS Presentation on Climate Adaptation	Colin Lang (OEIS)	9:30 to 10:00 a.m.
V. General Order Analysis Findings and Thematic Categories	Britney Gaines(CPUC) Maria Jaya (CPUC)	10:00 to 10:45 a.m.
BREAK		10:45 to 11:00 a.m.
VI. Proposed Regulatory Approaches	Sara Karim (CPUC)	11:00 to 11:30 a.m.
VII. Panel on Climate Adaptation Policy	Moderator: Audrey Williams (CPUC)	11:30 a.m. to 12:30 p.m.
VIII. Open Discussion	All	12:30 to 12:40 p.m.
IX. Next Steps and Closing Remarks	Audrey Williams (CPUC)	12:40 to 12:50 p.m.

Virtual Housekeeping

- Workshop is structured to stimulate conversations and engage different perspectives
- Keep comments courteous, professional and respectful
- Reach out to IT if you experience technical issues

Logistics

- All attendees have been muted
- To ask questions, please use the Chat function
- Opportunity to unmute during open Q&A
- Reminder – please mute when finished
- Workshop will be recorded and posted to CPUC website

Opening Remarks

Commissioner Houck, California Public Utilities Commission

Background and Purpose

Junaid Rahman, Senior Regulatory Analyst, Safety Policy Division

II. Background

- AB 111, passed in 2019, mandated review, as necessary… safety and regulatory requirements for electric facilities, along with recommendations related to climate change.
- The Phase 2 Scoping Memo (R.18-04-019, June 2, 2023) identified the need to update General Orders to better align with climate adaptation efforts.
    - The Safety Policy Division conducted a thorough review of the General Orders to assess and identify necessary modifications aimed at addressing climate adaptation.

CPUC Procedural History of R.18-04-019

- Order Initiating Rulemaking (R.18-04-019, May 7, 2018) was established to integrate climate change adaptation matters in relevant CPUC proceedings, safeguarding California's utility access against climate threats.
- The CPUC has issued two decisions in R.18-04-019 Phase 1 related to electric and gas utilities.
  - Decision on Definitions and Data (D.19-10-054, November 1, 2019)
    - Defines climate change adaptation for energy utilities in California:

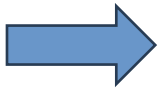
    "Climate change adaptation is adjustment in natural and human systems to a new or changing environment. Adaptation to climate change for energy utilities regulated by the Commission refers to adjustment in utility systems using strategic and data-driven consideration of actual or expected climatic impacts and stimuli or their effects on utility planning, facilities maintenance and construction, and communications, to maintain safe, reliable, affordable and resilient operations."
  - Decision on Disadvantaged Vulnerable Communities and Utility Vulnerability Assessments (D.20-08-046, September 3, 2020)
    - Established Community Engagement Plans and Climate Adaptation Vulnerability Assessments (CAVAs)

Alignment with International and California Climate Adaptation Efforts

Sixth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (UN IPCC) "Climate Change 2022: Impacts, Adaptation and Vulnerability"

California's Fourth Climate Assessment (2018); The California Climate Adaptation Strategy (2024)

Climate Adaptation Proceeding Phase 2



Climate Adaptation Proceeding (R.18-04-019)
- Definitions and Data (D.19-10-054)
- Disadvantaged Vulnerable Communities and Utility Vulnerability Assessments (D.20-08-046)

Workshop Purpose

- This workshop will present findings from the Safety Policy Division's analysis of the CPUC's General Orders regarding R.18-04-019 Phase 2 Task 6.
    - Task 6 focuses on updating General Orders to incorporate climate adaptation measures.
- This workshop aims to engage experts to gather insights on three possible strategies SPD proposes to update the General Orders in line with climate adaptation requirements.
- We are seeking to adequately incorporate climate adaptation into energy utility processes to increase ratepayer safety, reliability, and resilience, while having positive or neutral impacts on ratepayer affordability.

Questions?

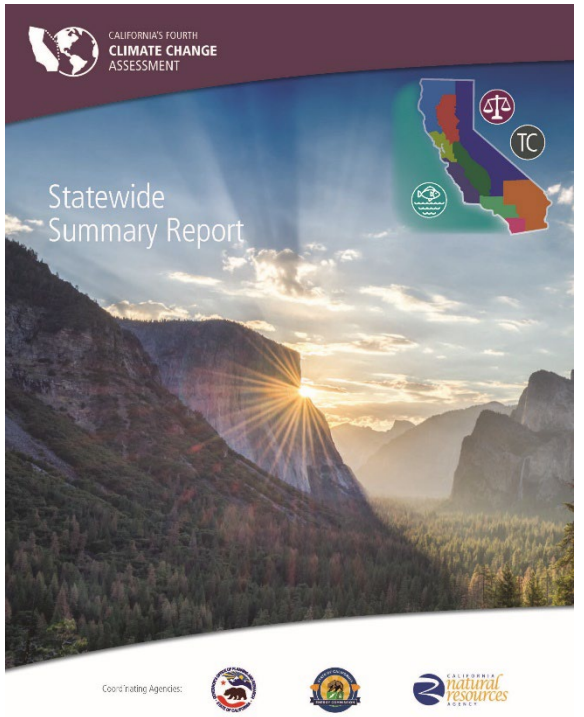
California Climate Adaptation Landscape

Sara Moore, Senior Regulatory Analyst, Safety Policy Division

California Assessments and Strategy

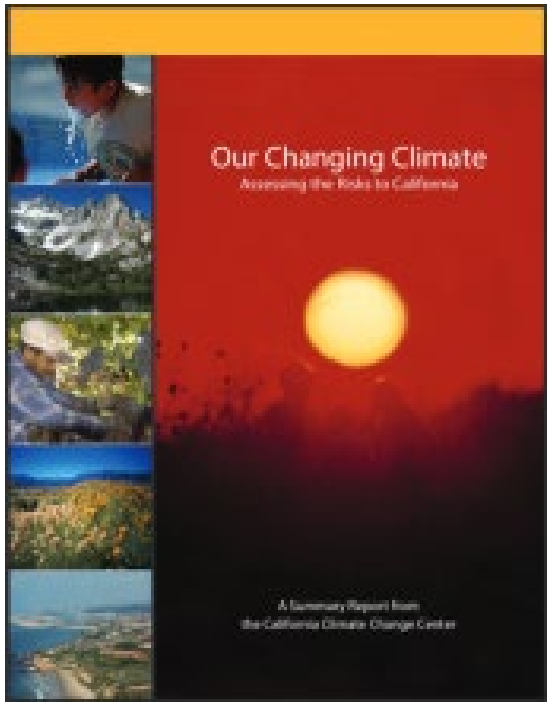
- ***California's Climate Change Assessment*** (5-year cycle)
  - Interagency report (Natural Resources Agency, Energy Commission, Governor's Office of Land Use and Climate Innovation)
  - Conducted via the Integrated Climate Adaptation and Resiliency Program (ICARP)
  - 4th assessment released in 2018
  - 5th is underway and scheduled for 2026
  - Includes 9 regional reports

- ***California Climate Adaptation Strategy*** (3-year cycle) links together the state's existing and planned climate adaptation efforts, showing how they fit together to achieve California's climate resilience priorities.



State Climate Adaptation – Highlights

Year	Effort
2005	State launched CA Climate Change Assessment "Our Changing Climate"(2006), downscales UN IPCC models, updated every 5 years
2008	State launched CA Climate Adaptation Strategy (2009), updated every 3 years
2009	Office of Environmental Health Hazard Assessment (OEHHA) launched the first "Indicators of Climate Change in California" report, updated every 3 years
2010	Ocean Protection Council issued State of California Sea-Level Rise Guidance, updated 2013, 2018, 2024
2011	Cal-Adapt.org launched, updated 2017 (Cal-Adapt 2.0)
2012	California Emergency Management Agency and California Natural Resources Agency (CNRA) launched the first California Adaptation Planning Guide, updated 2020 by California Governor's Office of Emergency Services
2013	California Environmental Protection Agency and the California Department of Public Health launched Preparing California for Extreme Heat, updated 2022 by CNRA



Climate Adaptation Phase 2 (R.18-04-019)

- Phase 2 is outlined in the June 2023 Scoping Memo. Task 6 in the Scoping Memo describes possible updates to General Orders for climate adaptation.
  - "Should the Commission update any General Orders to ensure they appropriately reflect climate adaptation needs? If so, which General Orders merit consideration? What process should be used to update them?"
  - Safety Policy Division conducted an analysis of CPUC General Orders.

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Questions?

Office of Energy Infrastructure Safety (OEIS) Presentation

Colin Lang (OEIS)

AREAS TO CONSIDER FOR GENERAL ORDER MODIFICATION TO ADDRESS THE DYNAMIC RISK OF CLIMATE CHANGE AND TO MITIGATE WILDFIRE RISK

Pursuant to PUC 326(a)(7)

April 17, 2025

AGENDA

- Statutory Authority
- Wildfire Mitigation as Climate Mitigation
- Research and Inputs
- Areas to Consider for General Order Modification
- Conclusion

STATUTORY AUTHORITY

Public Utilities Code section 326(a)(7) authorizes the Office of Energy Infrastructure Safety to:

> *…**review**, as necessary, in coordination with the California Wildfire Safety Advisory Board and necessary commission staff, **safety requirements** for electrical transmission and distribution infrastructure and infrastructure and equipment attached to that electrical infrastructure, **and provide recommendations to the commission to address the dynamic risk of climate change and to mitigate wildfire risk**.*

WILDFIRE MITIGATION AS CLIMATE MITIGATION

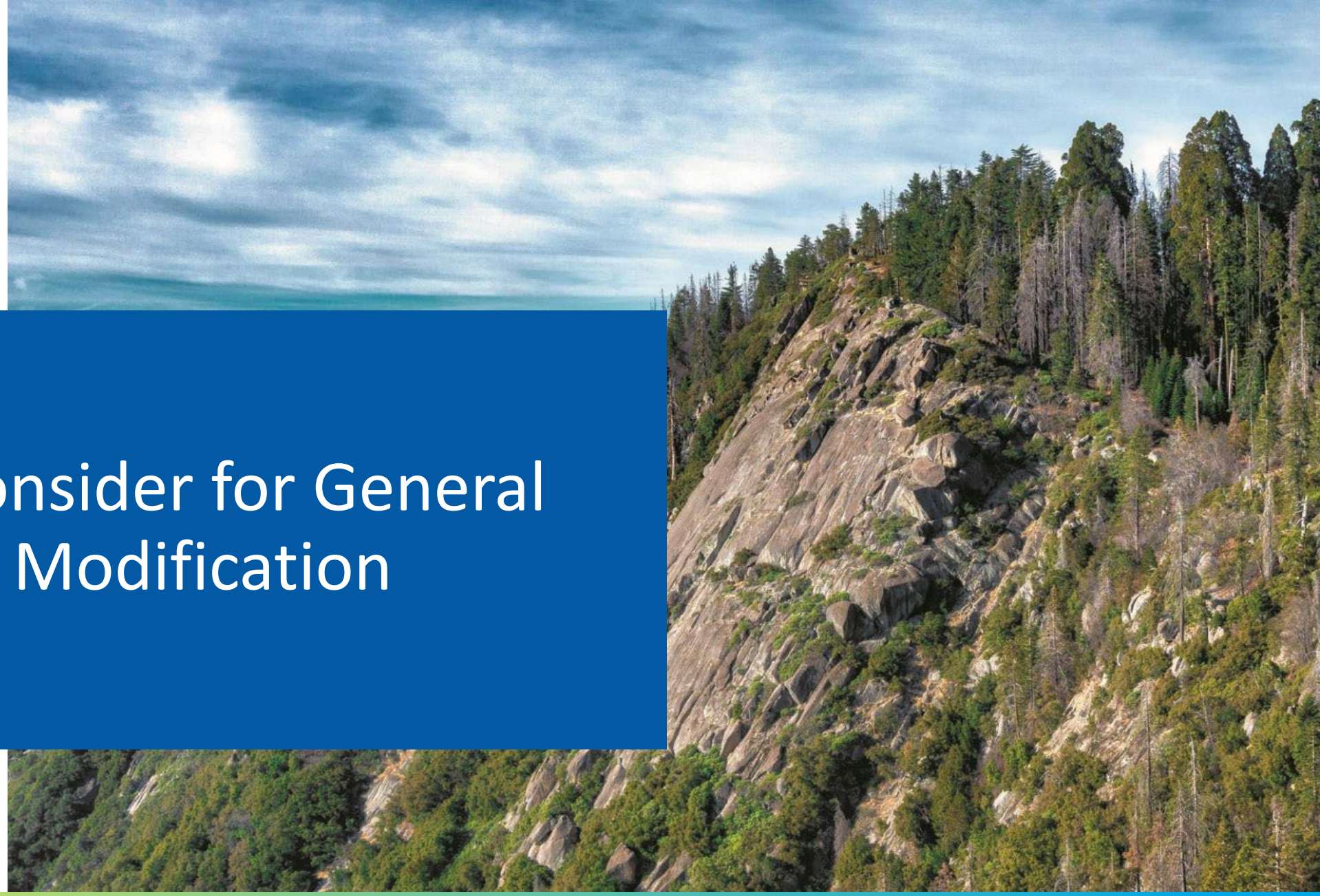
- **Safety:** Reducing wildfire risk from utility infrastructure protects Californians and ecosystems from climate-enhanced wildfire disasters.
- **Reliability:** Wildfire mitigations, such as vegetation management and grid hardening, reduce outages.
- **Resilience:** Wildfire mitigations, including grid monitoring and weather forecasting allows utilities to anticipate risks from wind, heat, and other climate factors, and prepares utilities to proactively respond to/prepare for climate-enhanced disasters.

RESEARCH AND INPUTS

Energy Safety has considered the following inputs in its effort:

- WMPs, WMP evaluations, and WMP maturity surveys
- Assigned contractor baseline and recommendation reports – contract duration: June 2022 to December 2023
- Stakeholder feedback via workshop and written comments submitted post-workshop – workshop held July 13 & 14, 2023
- Wildfire Safety Advisory Board (WSAB) recommendations and policy papers – policy papers published February 2024

Areas to Consider for General Order Modification



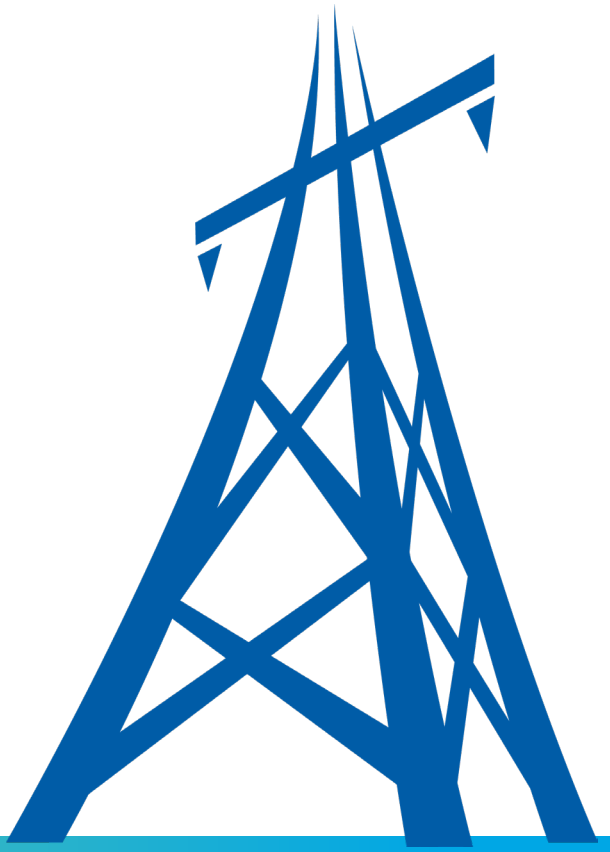
ASSET INVENTORIES

Asset inventories are necessary for:

- Recording of essential information about electrical assets.
- Facilitating evolution to component lifecycle management (and away from run to failure) through:
    - Proactive inspections and maintenance.
    - Timely identification and remediation of potential issues.

For Consideration:

- Establish General Order requirements for asset inventories that are digital, geospatial, and include standard attributes and nomenclature.



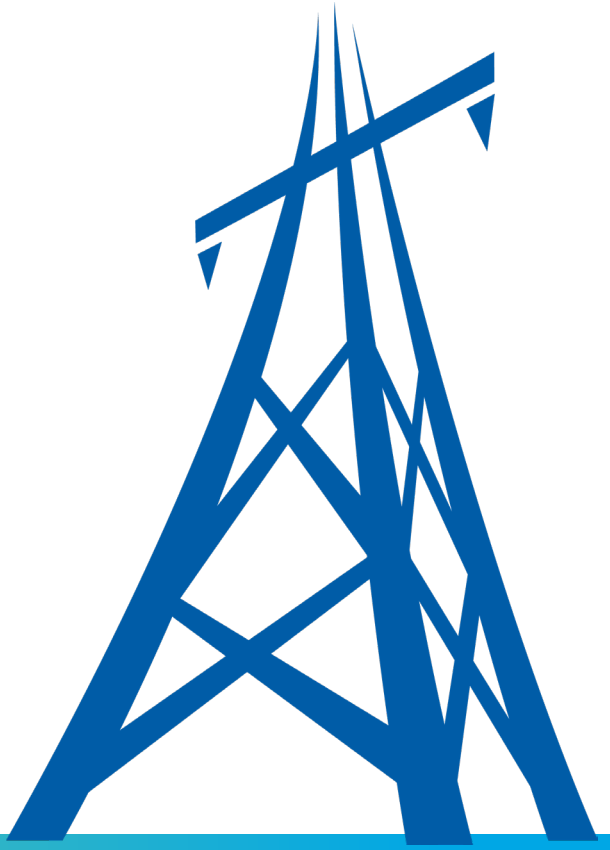
WEATHER STATIONS & DATA

Accurate weather data are necessary for:

- Forecasting weather indicative of high wildfire/climate risk
- Operationally responding to that weather (e.g., disable reclosers, initiate a PSPS, pause construction that may produce sparks).
- Improving risk modeling, risk prioritization, and decision-making for maintenance, operations, and construction (e.g., identify and prioritize circuits for system hardening investment, such as covered conductor and undergrounding).

For consideration:

- Establish General Order requirements for weather stations, including the capabilities of stations, placement of stations, maintenance of stations, data collection standards, and use of the data.

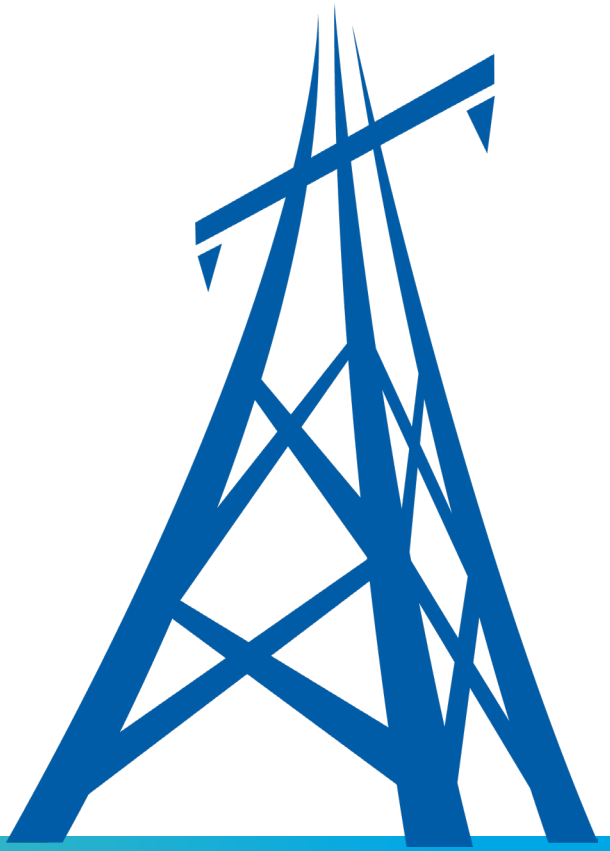


FUTURE CLIMATE CONDITIONS IN CONSTRUCTION STANDARDS

General Order 95, Rule 31.1 requires that design, construction, and maintenance be done in accordance with “known local conditions.”

For Consideration:

- Modify General Order 95 to require the consideration of climate change forecasts in design, construction, and maintenance.



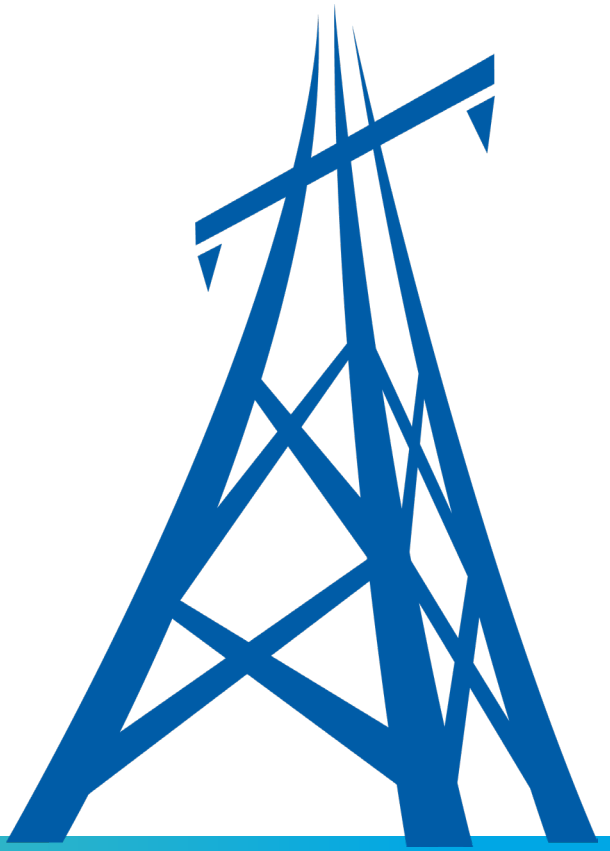
EXEMPT/NON-EXEMPT EQUIPMENT

Exempt equipment is designed and tested to limit arcs/sparks and/or expelling of hot material during operation.

Replacement non-exempt equipment would reduce the number of possible utility-related ignitions.

For Consideration:

- Modify General Order 95 to prohibit the installation of new non-exempt equipment in high wildfire risk areas.
    - Prioritize non-exempt equipment with a higher likelihood of ignition, such as fuses and lightning arrestors.
- Modify General Order 95 to require the proactive replacement of non-exempt equipment with exempt equipment in high wildfire risk areas.



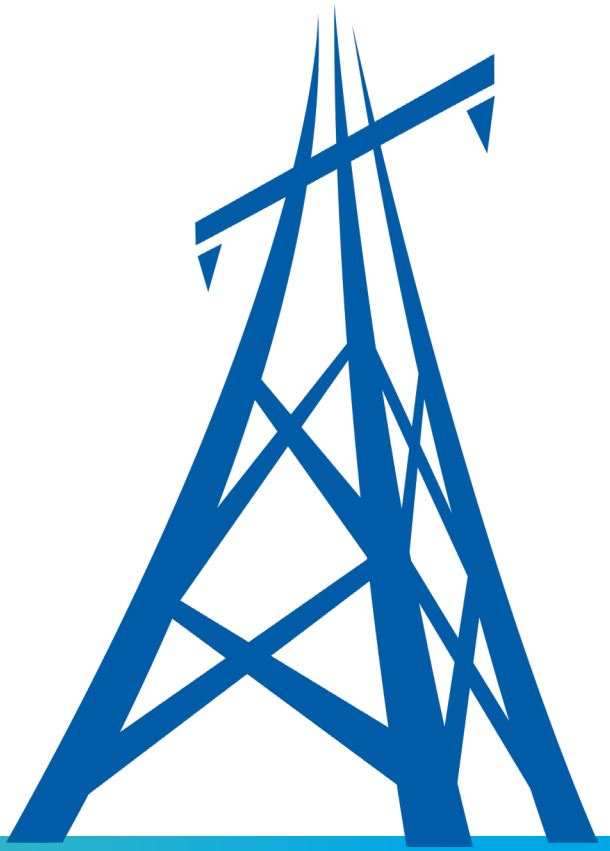
PRE-GO 95 EQUIPMENT

Equipment installed prior to the inception of and updates to GO 95 (pre-GO 95 equipment) may not necessarily meet the purpose of the rules to “secure safety… to the public…” and may pose a wildfire risk.

Aging equipment and infrastructure, including pre-GO 95 equipment, is associated with increasing wildfire risks.

For Consideration:

- Establish General Order requirements regarding the continued use of equipment predating General Order 95 and the conditions under which pre-GO 95 equipment should be replaced.



RISK-INFORMED INSPECTIONS

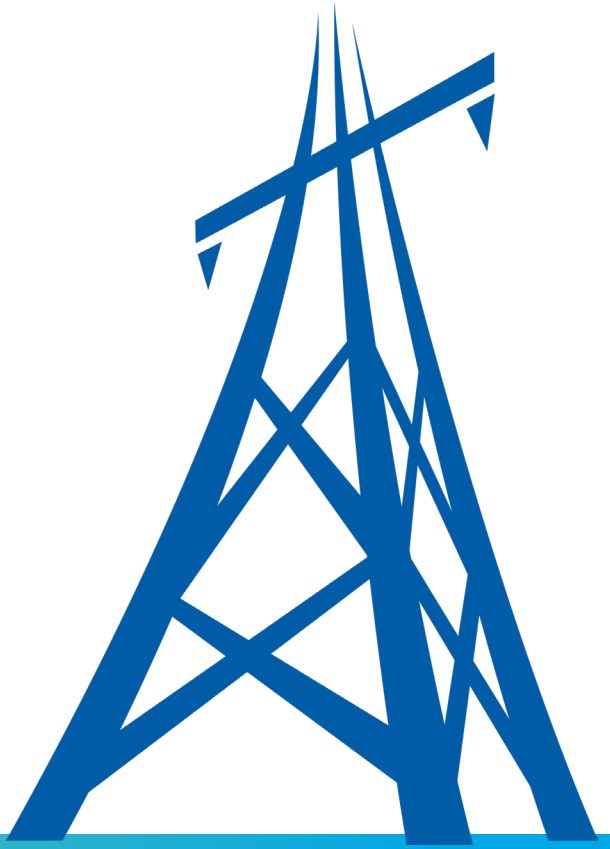
Certain electrical assets are more likely to cause an ignition.

Certain areas have a higher likelihood of ignition and consequence if an ignition occurs.

General Orders do not explicitly require the inspection of vegetation.

For Consideration:

- Modify General Order 165 to require risk-based, risk-prioritized inspections of assets and vegetation in high wildfire risk areas.



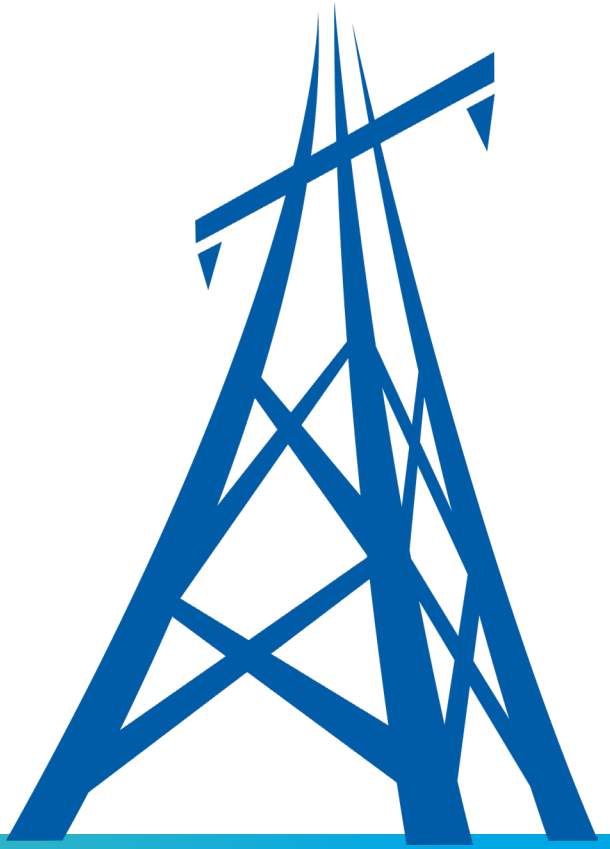
REMOTE MONITORING & OPERATING DEVICES

Remote devices can detect faults and other critical conditions and trigger automatic operations, like de-energization and the dispatch of resources.

- Reduce the likelihood of the fault causing an ignition.
- Decrease response time to critical conditions.

For consideration:

- Establish General Order requirements for the installation and maintenance of remote monitoring and operating devices.
- Modify General Order 95 to require lines in high wildfire risk areas be fitted with protective devices whose response times can be increased, and automatic reclosers that are capable of being remotely disabled.



ADOPTION OF ANSI STANDARDS

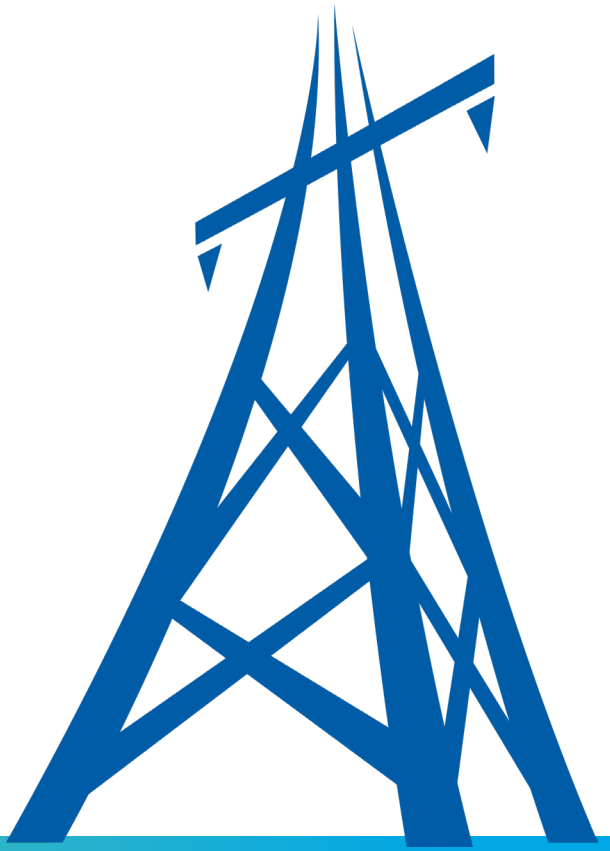
The American National Standards Institute (ANSI) A300 Tree Care standards provide standard practices and specifications for, amongst other things, the pruning of trees.

Adherence to ANSI A300 standards ensures the health of the tree and reduces the need for and expense of repeated pruning.

These industry standards are currently in use by all the electrical corporations.

For Consideration:

- Modify General Order 95, Rule 35 and Table 1, to align with ANSI A300 pruning standards.



Conclusion

Given the changing climate, we need to think differently about the minimum standards for how utilities design, construct, and maintain the grid.

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OFFICE OF ENERGY INFRASTRUCTURE SAFETY
A California Natural Resources Agency

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Questions?

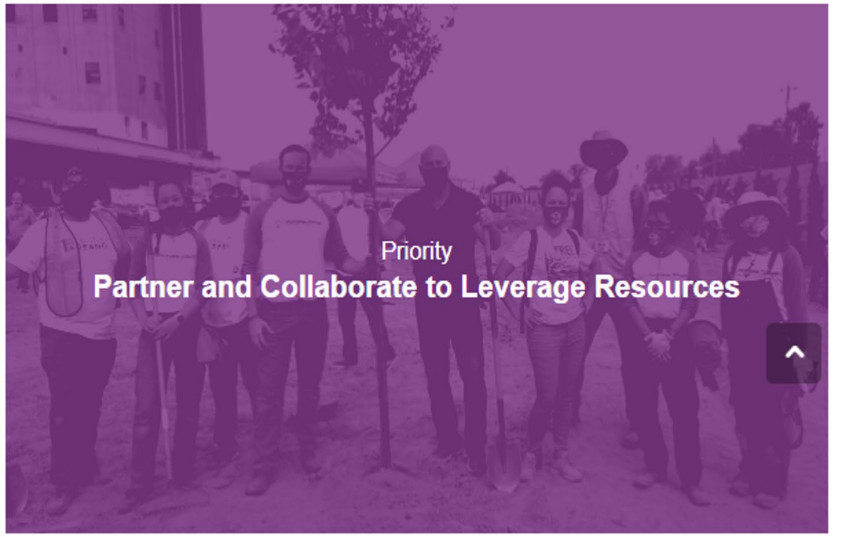
General Order Analysis

Britney Gaines, Research Data Specialist, Safety Policy Division

General Order Analysis – Background

- **GO – General Order** (CPUC Glossary): A Public Utilities Commission order that sets standards, procedures, or guidelines applicable to a class of utilities, rather than a decision affecting just one utility.
- SPD conducted a comprehensive review of CPUC's 94 GOs to assess their ability to address utility infrastructure, construction, maintenance, and management in relation to climate adaptation.
- SPD identified GOs that fit within the scope of R.18-04-019 and could be modified to align with climate adaptation goals.
- Our analysis was grounded in the Fourth California Climate Assessment and Strategy.

California Climate Adaptation Strategy – Priorities



GO Analysis – Explained

- SPD analyzed 94 CPUC GOs.
- The analysis objective was to assess the ability of GOs to address utility infrastructure, construction, maintenance, and management in relation to climate adaptation.
- The analysis used a 3-round process applying inclusion criteria to each GO:

First Round Screening – Criteria

- Identified GOs that target industries within R.18-04-019 scope and infrastructure that could incorporate consideration of a changing climate
- Excluded GOs with only ministerial or financial transactions purposes

Inclusion Criteria
Electric, Gas, Telecommunication
Safety, Reliability Standards
Operation, inspection, facilities maintenance
Assets (e.g, substations)
Utility planning, site selection process for infrastructure, construction
Hazard analysis, vulnerability analysis of services or system designs
Ratemaking for standard services that are not related to transportation industry
Communication including outreach to customers and the public, internal communication, and reporting to the CPUC

Exclusion Criteria
Rail including railroad, railway, train
Easement
Privacy
Financial transaction including fees, notes, interest, liability
Ministerial including record keeping or internal CPUC administration
Transportation, including carriers, ferries, and motor vehicles

First Round Screening – Outcome

- 16 GOs included
- 78 GOs Excluded

Inclusion Criteria	GOs Fitting Criteria *
Electric, Gas, Telecommunication	**(16)** 50, 52, 58-A, 58-B, 94-B, 95, 103-A, 112-F, 128,159-A, 165, 166, 167-B, 171, 174, 177
Safety, Reliability Standards	**(5)** 58-A, 58-B, 103-A, 166, 167-B
Operation, inspection, facilities maintenance	**(6)** 52, 58-B, 94-B, 112-F, 165, 167-B
Assets (e.g, substations)	**(1)** 174
Utility planning, site selection process for infrastructure, construction	**(7)** 50-B, 52, 94-B, 95, 103-A, 112-F, 159-A
Hazard analysis, vulnerability analysis of services or system designs	**(3)** 94-B, 103-A, 112-F
Ratemaking for standard services that are not related to transportation industry	**(2)** 58-A, 103-A
Communication including outreach to customers and the public, internal communication, and reporting to the CPUC	**(1)** 177

* GO inclusion under a criterion not mutually exclusive

Second Round Screening – Criteria and Outcome

- 6 questions informed by the 6 State Climate Adaptation priorities, evaluating the 16 GOs selected from First Round
- 11 GOs fit the inclusion criteria for Second Round

Inclusion Questions	Number of GOs Fitting Inclusion Criteria
1. Can the GO be **leveraged and/or modified to account for change in climate**?	**11**
2. Are there **sections of the GO** that are **connected to continuity of service failure**?	**8**
3. Does the GO **focus on the way generation, transmission, substations, or other facilities are designed, build, sited and operated**?	**10**
4. Are there any **opportunities for technological advancement** in the GO t**o account for a change in climate**?	**2**
5. Can the GO be **leveraged and/or modified to touch on repetitive loss or repair of an infrastructure**?	**7**
6. Is there some sort of **hazard or vulnerability captured within the GO**?	**9**

* GO inclusion under a criterion not mutually exclusive

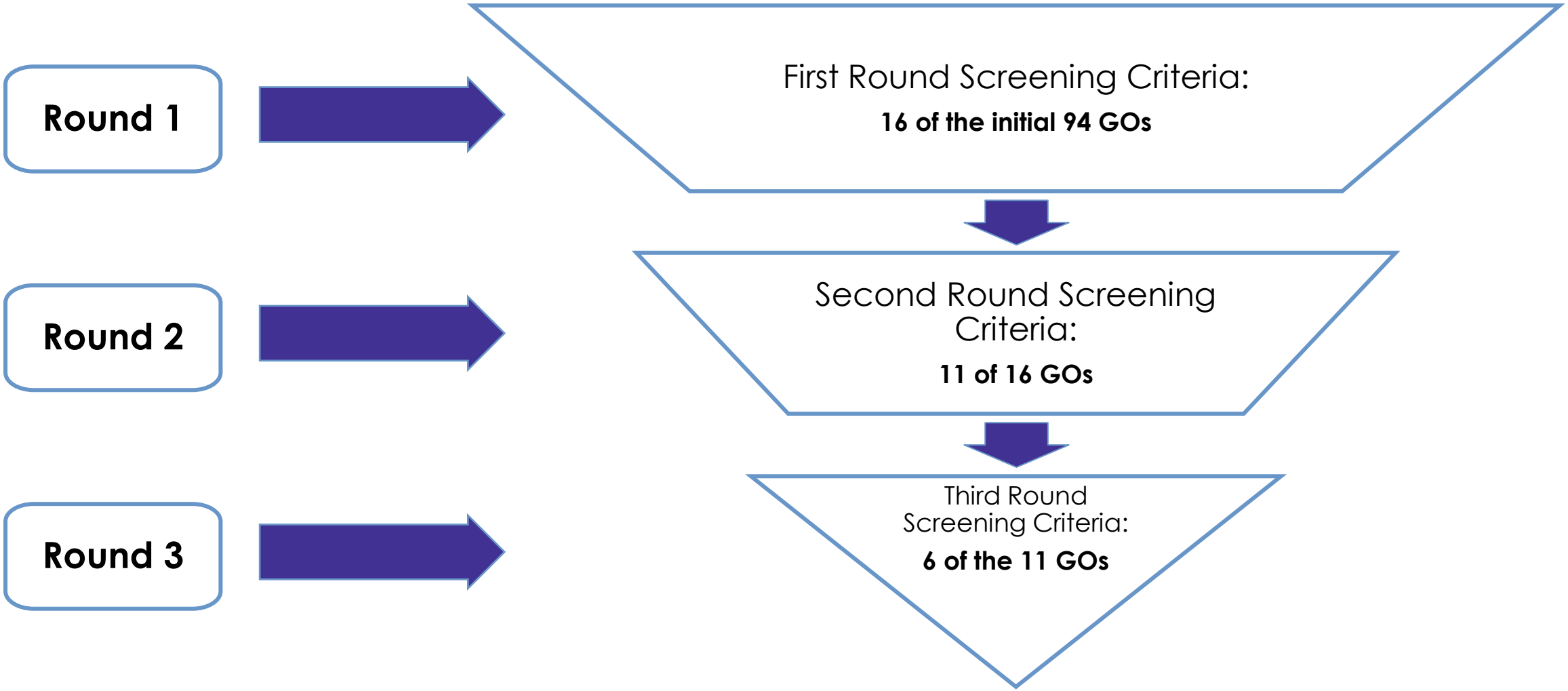
Third Round Screening – Criteria and Outcome

- SPD collaborated with subject matter experts across CPUC to review 11 GOs from the second round.
  - Review objective - to assess feasibility of GOs being altered to address climate adaptation priorities
- **5 GOs were excluded** because they could not be modified and/or already addressed climate adaptation requirements.
- **6 GOs were included** as they could feasibly be adjusted to address priorities and fit previous screening criteria.

Subject matter experts from CPUC's:

- Water Division
- Energy Division
- Safety Enforcement Division
- Safety Policy Division
- Legal Division

General Order Analysis – Screening Results



Analysis: Thematic Categories (1/2)

- Examined the final 6 GOs and derived common categories and crosscutting themes related to climate adaptation.

- Thematic categories could assist in defining lanes to help strategically approach modifications to General Orders.

Analysis: Thematic Categories (2/2)

1. Site Selection	•Requirements for selecting a site on energy projects
2. Construction	•Requirements for constructing a new energy infrastructure
3. Equipment Tolerance	•Requirements for equipment tolerance for climate adaptation
4. Repetitive Loss	•Requirements that relates to loss of infrastructures
5. Reporting Requirement	•Requirements for reporting to CPUC
6. Inspections	•Requirements on inspections and maintenance of infrastructures
7. System Failure	•Requirements on service disruptions or continuity of services
8. Reconstruction	•Requirements on damaged infrastructures
9. Processes	•Requirements on vulnerabilities through state and federal engagement

Questions?

Findings and Thematic Categories

Maria Jaya, Senior Regulatory Analyst, Safety Policy Division

Introduction to Findings and Thematic Categories

- To address climate change, we may need to modify these GOs to enhance resilience, minimize disruptions, and protect communities.
- Thematic categories for climate adaptation could facilitate a structured policy modification.
  - Climate adaptation thematic categories cross-cut multiple GOs, highlighting common regulatory themes across infrastructure type.

Findings of GO Analysis

- SPD identified 6 GOs that could be modified to address climate adaptation for energy utilities.

GO 95: Overhead Electric Line Construction

GO 128: Rules for Underground Electric Supply and Communication Systems

GO 165: Inspection Cycles for Electric Distribution Facilities

GO 166: Standards for Operation, Reliability, and Safety During Emergencies and Disasters

GO 167-B: Enforcement of Maintenance and Operation Standards for Electric Generating Facilities

GO 174: Rules for Electric Utility Substations

Nine Thematic Categories

1. Site Selection	•Requirements for selecting a site on energy projects
2. Construction	•Requirements for constructing a new energy infrastructure
3. Equipment Tolerance	•Requirements for equipment tolerance for climate adaptation
4. Repetitive Loss	•Requirements that relates to loss of infrastructures
5. Reporting Requirement	•Requirements for reporting to CPUC
6. Inspections	•Requirements on inspections and maintenance of infrastructures
7. System Failure	•Requirements on service disruptions or continuity of services
8. Reconstruction	•Requirements on damaged infrastructures
9. Processes	•Requirements on vulnerabilities through state and federal engagement

Thematic Categories and GO Findings

- The 9 thematic categories for climate adaptation cut across these GOs

	GO 95	GO 128	GO 165	GO 166	GO 167-B	GO 174
1. Site Selection	X	X				X
2. Construction	X	X				X
3. Equipment Tolerance	X	X		X	X	X
4. Repetitive Loss	X				X	
5. Reporting Requirement	X		X	X	X	X
6. Inspections	X	X	X		X	X
7. System Failure Data	X	X			X	
8. Reconstruction	X	X			X	
9. Processes		X	X	X	X	

Examples of Organizing by Thematic Categories

- Impacts to ***site selection*** for infrastructure (e.g., GO 95, GO 128, and GO 174)
- Scope or frequency of ***inspections*** by utilities could be modified to better monitor current and future climate change impacts (e.g., GO 128, GO 165, and GO 174)
- ***Mandatory reporting*** could be modified to capture the role of climate change impacts in outages or system failures (e.g., GO 128 and GO 166)
- Standards for how infrastructure is ***designed and constructed*** (e.g., GO 95, GO 128, and GO 174)

Questions?

Break

Return at 10:20 AM

Proposed Regulatory Approaches

Sara Karim, Regulatory Analyst, Safety Policy Division

Considerations for Courses of Action

- Support resilience
  - Guide future rulemaking
  - Consistent and complementary
- Minimize Damage
  - System failures
  - Major outages
  - Climate hazards
- Affordability for ratepayers

Courses of Action

1. Update individual General Orders through separate proceedings or one larger proceeding with multiple tracks and phases.

2. Establish standards and rules for climate adaptation through a General Order.

3. Establish standards and rules for climate adaptation through a CPUC Decision using thematic categories.

Course of Action 1 – Update Individual General Orders

Update individual General Orders through separate proceedings or one larger proceeding

- The CPUC could update existing GOs with climate adaptation requirements
- Example text from one General Order: Present language of GO 128 Rule 17.1 Design, Construction, and Maintenance:
    - Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use, regarding the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service
    - For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of [the] communication or supply lines and equipment

Pros and Cons
Course 1: Update Individual General Orders

Pros	Cons
• Addressing General Orders individually allows for a tailored modification to address climate adaptation. • Individual decisions may be amended through the Petition for Modifications process or fully replaced by new decisions.	• Will require individual proceedings for each identified General Order or one large proceeding with multiple tracks and phases. • This may make future maintenance and modifications of decisions more complex.

Course of Action 2 – Proposed Climate Adaptation General Order

Establish standards and rules for climate adaptation through a General Order using thematic categories

For example:

- Integrate climate change considerations into infrastructure development and maintenance, which would be organized by the nine thematic categories
- Integrate climate hazard projections in the site selection of electrical infrastructure
- Require Electrical IOUs to provide reports on projects that are organized by the nine thematic categories (short to medium term)
- Establish a working group that will meet monthly to share best practices in these areas

Pros and Cons
Course 2: Climate Adaptation General Order

Pros	Cons
• General Orders can create an umbrella over certain topics • Centralize and provide a foundation for coordination of future modification of climate adaptation rules and standards	• General Orders may require more coordination to modify than individual decisions • Creating a general order can take a long time versus a decision

Course of Action 3 – CPUC Decision Establishing Standards and Rules

Establish standards and rules for climate adaptation through a CPUC Decision using thematic categories

- Involve creating some encompassing climate adaptation documents through the current proceeding
- Would not directly modify any GO
- Could achieve similar ends as examples given for creating a new GO

Pros and Cons
Course 3: Climate Adaptation Decision

Pros	Cons
• Decisions are more flexible and easier to change to respond to new science and environments. • Decisions can be more targeted and specific.	• Flexibility may not be a goal we want to achieve. • Decisions are less centralized than General Orders, to enable future modification • This may make future maintenance and modifications of decisions more complex.

Questions?

Panel on Climate Adaptation Policy

Audrey Williams, Program & Project Supervisor, Safety Policy Division

Questions

- Introduction
  - Name, title, organization
  - Reaction to presented analysis

Questions

- How is climate change adaptation currently incorporated into energy utility planning processes in the short-, medium-, and long-term?
- What are the gaps in climate change adaptation within the energy utility planning processes, if any, in the short-, medium-, and long-term?
- What, if anything, can be done to help improve the resiliency of California's electric infrastructure to climate hazards, including coastal flooding, inland flooding, storms, extreme heat, and drought?

Questions

- How can General Orders be modified to adequately incorporate climate adaptation considerations into energy utility planning processes to improve:
  - ratepayer safety
  - reliability
  - resilience
- How can we do this while maintaining positive or neutral impacts on ratepayer affordability?
- Are there suggestions on ways to organize the discussed approaches? (ie GO vs. thematic category)

Open Discussion

Next Steps and Closing Remarks

Audrey Williams, Program & Project Supervisor, Safety Policy Division

Building the Evidentiary Record

- Follow up ruling will be issued with questions for parties on this proposal.
- The recording for this workshop will be posted to our website.

California Public Utilities Commission

Audrey Williams, Safety Policy Division, PPS
Audrey.Williams@cpuc.ca.gov