STATE OF CALIFORNIA EDMUND G. BROWN JR., *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

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November 19, 2013

Agenda ID #12589
Quasi-Legislative

TO PARTIES OF RECORD IN RULEMAKING 08-11-005:

This is the proposed decision of Commissioner Florio. It will not appear on the Commission's agenda sooner than 30 days from the date it is mailed. The Commission may act then, or it may postpone action until later.

When the Commission acts on the proposed decision, it may adopt all or part of it as written, amend or modify it, or set it aside and prepare its own decision. Only when the Commission acts does the decision become binding on the parties.

Parties to the proceeding may file comments on the proposed decision as provided in Article 14 of the Commission's Rules of Practice and Procedure (Rules), accessible on the Commission's website at www.cpuc.ca.gov. Pursuant to Rule 14.3, opening comments shall not exceed 15 pages.

Comments must be filed pursuant to Rule 1.13 either electronically or in hard copy. Comments should be served on parties to this proceeding in accordance with Rules 1.9 and 1.10. Electronic and hard copies of comments should be sent to ALJ Kenney at tim@cpuc.ca.gov. Comments should be served to Commissioner Florio's advisor Marcelo Poirer at mpo@cpuc.ca.gov in electronic format only. The current service list for this proceeding is available on the Commission's website at www.cpuc.ca.gov.

/s/ KAREN V. CLOPTON
Karen V. Clopton, Chief
Administrative Law Judge

KVC:avs

Attachment

Decision **PROPOSED DECISION OF CMMR FLORIO** (Mailed 11/19/2013)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Revise and Clarify Commission Regulations Relating to the Safety of Electric Utility and Communications Infrastructure Provider Facilities.	Rulemaking 08-11-005 (Filed November 6, 2008)

DECISION ADOPTING REGULATIONS TO REDUCE THE FIRE HAZARDS ASSOCIATED WITH OVERHEAD ELECTRIC UTILITY FACILITIES AND AERIAL COMMUNICATIONS FACILITIES

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DECISION ADOPTING REGULATIONS TO REDUCE THE FIRE HAZARDS ASSOCIATED WITH OVERHEAD ELECTRIC UTILITY FACILITIES AND AERIAL COMMUNICATIONS FACILITIES

1. Summary

This decision revises General Order (GO) 95 to incorporate new and modified rules to reduce the fire hazards associated with overhead power lines and aerial communication facilities in close proximity to power lines. The most significant revisions adopted by this decision are as follows:

- Construction Grade "F" is eliminated. This has the effect of requiring communications-only facilities to be built with higher safety factors.
- The vertical loads that overhead facilities must support are increased to reflect the increased weight of workers and their equipment.
- The loading calculations for the planned addition of facilities to a pole must (1) incorporate the most recent intrusive inspection results, if available, (2) reflect the condition of the pole, and (3) use industry recognized values of relevant parameters.
- Records of loading calculations must be retained for the service life of the pole for which the calculations are performed.
- GO 95 is reformed to incorporate modern standards regarding the design and construction of utility structures using wood, steel, and other engineered materials.

In addition to the above revisions to GO 95, this decision orders electric utilities and communications infrastructure providers to henceforth design and construct their overhead facilities in accordance with the will-not-fail performance standard in Rule 48 of GO 95. This decision also approves a consensus plan for investor-owned electric utilities (IOUs) to report fire incidents to the Commission's Safety and Enforcement Division (SED), and for SED to use

this data to identify systemic fire-safety risks and develop measures to mitigate the fire-safety risks.

The fire-safety regulations adopted by this decision carry out the statutory mandate in Public Utilities Code Section 451 that:

> Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities, including telephone facilities… as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public.

There are no estimated costs for the regulations adopted by this decision. This decision finds that the additional costs, if any, are more than offset by the significant public-safety benefits. The IOUs are authorized to track the costs they incur to implement the regulations adopted by this decision and to file applications to recover these costs. The IOUs shall thereafter seek to recover such costs in their general rate case (GRC) proceedings. The Small Local Exchange Carriers may use their annual California High Cost Fund-A advice letters to recover the costs they incur to implement the regulations adopted in this proceeding until their next GRC proceedings.

2. Background

2.1. Procedural Background

In October 2007, strong Santa Ana winds swept across Southern California and caused dozens of wildfires. The resulting conflagration burned more than 780 square miles, killed 17 people, and destroyed thousands of homes and buildings. Hundreds of thousands of people were evacuated at the height of the fire siege. Transportation was disrupted over a large area for several days, including many road closures. Portions of the electric power network, public communication systems, and community water sources were destroyed.

Several of the worst wildfires were reportedly ignited by power lines. These included the Grass Valley Fire (1,247 acres), the Malibu Canyon Fire (4,521 acres), the Rice Fire (9,472 acres), the Sedgewick Fire (710 acres), and the Witch Fire (197,990 acres). The total area burned by these five power-line fires was more than 334 square miles.

In response to the widespread devastation, the Commission issued Order Instituting Rulemaking (R.) 08-11-005 to consider and adopt regulations to reduce the fire hazards associated with overhead power lines and aerial communication facilities in close proximity to power lines. Most of the Commission's regulations regarding the construction, operation, and maintenance of overhead utility facilities are in General Order (GO) 95 and GO 165. A major goal of these GOs is to minimize public safety hazards, including fire hazards, associated with overhead utility facilities.

R.08-11-005 was initially divided into two phases. Phase 1 focused on fire-prevention measures that could be implemented in time for the 2009 autumn fire season in Southern California. Phase 1 concluded with the issuance of Decision (D.) 09-08-029. Phase 2 addressed matters that required more time to consider and implement. Phase 2 concluded with the issuance of D.12-01-032. In D.12-01-032, the Commission instituted a new Phase 3 to address the issues enumerated in Ordering Paragraph 8 of that decision.

A prehearing conference for Phase 3 was held on April 23, 2012. The *Assigned Commissioner's Ruling and Scoping Memo for Phase 3 of this Proceeding*, dated June 1, 2012, (hereafter, "the Phase 3 Scoping Memo") determined that the scope of Phase 3 would be limited to the following issues identified in Ordering Paragraph 8 of D.12-01-032 and the Phase 3 Scoping Memo:

1. Revising Section IV of GO 95 to reflect modern materials and practices, with the goal of improving fire safety.
2. Revising Section IV of GO 95 to incorporate standards for wood structures and materials that (i) provide electric utilities and communications infrastructure providers (CIPs) with clear guidance for reliably obtaining prescribed safety factors when using wood products with inherent variability, and (ii) can be enforced by the Commission and the Commission's Safety and Enforcement Division (SED).
3. Revising Section IV of GO 95 to incorporate (i) a new High Fire-Threat District, (ii) one or more maps of the High Fire-Threat District, and (iii) fire-safety standards for the design and construction of electric utility and CIP structures in the High Fire-Threat District.
4. Assessing whether any of the new fire-safety standards developed pursuant to the previous Item 3.iii should apply to existing facilities in the High Fire-Threat District and, if so, developing a plan, timeline, and cost estimate for upgrading existing facilities to meet the new standards.
5. Developing a plan for investor-owned electric utilities (IOUs) to report data to SED regarding power-line fires and for SED to use such data to (i) identify and assess systemic fire-safety risks associated with overhead power-line facilities and aerial communications facilities in close proximity to power lines, and (ii) formulate cost-effective measures to reduce systemic fire risks.
6. Preparing a detailed work plan for the development, expert review, adoption, implementation, and funding of fire-threat map(s) for the purposes identified in Item 7 below.
7. Developing and adopting fire-threat map(s) in conformance with the work plan prepared pursuant to Item 6 above. The adopted fire-threat maps must be capable of being used for the following purposes:
    i. In conjunction with the fire-prevention measures adopted in this proceeding that rely on fire-threat maps for their implementation.

ii. Identifying the boundaries of the High Fire-Threat District identified in Item 3 above.

8. Implementation issues associated with any requirements adopted in Phase 3, including cost recovery and the timeframe for implementing the new rules and requirements.

The Phase 3 Scoping Memo excluded (i) matters that are focused on reducing utilities' legal liability; and (ii) replacing GO 95's design methodology for structures and facilities.

The Phase 3 Scoping Memo established a three-track workshop process to address Phase 3 issues. The three tracks are:

Track 1: GO 95 Rule Changes. The purpose of this track is to develop and evaluate proposed revisions to GO 95 identified in Issues 1 – 4 above.

Track 2: Fire Data. The purpose of this track is to develop a plan for IOUs to report data to SED regarding fires associated with overhead power-line facilities, and for SED to use the data, as set forth in Issue 5 above.

Track 3: Fire-Threat Maps. The purpose of this track is to first prepare a work plan for the development, expert review, adoption, implementation, and funding of fire-threat maps, as set forth in Issue 6 above, and then use the work plan to guide the actual development, review, and adoption of fire-threat maps as set forth in Issue 7 above.

The Phase 3 Scoping Memo established two workshop processes, one for Tracks 1 and 2, and the other for Track 3. As the workshops for Tracks 1 and 2 progressed, the parties were unable to develop recommendations regarding the following issues assigned to Track 1:

- Revising GO 95 to incorporate (i) a new High Fire-Threat District, (ii) maps of the High Fire-Threat District, and (iii) fire-safety standards for the design and construction of electric utility and CIP structures in the High Fire-Threat District. (Issue 3 above.)

- Assessing whether any of the new fire-safety standards developed pursuant to the previous bullet should apply to existing facilities in the High Fire-Threat District. (Issue 4 above.)

The participants in the workshop process reported that implementable recommendations regarding the above Track 1 issues could not be formulated until after fire-threat maps are adopted in Track 3. Accordingly, the above Track 1 issues were deferred to Track 3 pursuant to the *Assigned Commissioner's Amended Scoping Memo and Ruling For Track 3 Issues and Deferred Track 1 Issues* dated May 15, 2013 (hereafter, the "Amended Phase 3 Scoping Memo").

Today's decision addresses non-deferred Track 1 issues and Track 2 issues (i.e., Issues 1, 2, and 5 above). The deferred Track 1 issues and Track 3 issues will be addressed in future Commission decisions.

2.2. The Phase 3 Workshops for Track 1 and Track 2

The Phase 3 Scoping Memo established a two-stage workshop process for Tracks 1 and 2. Stage 1 consisted of self-directed technical panels to develop consensus proposals (Technical Panels). There was one Technical Panel for Track 1 and a second Technical Panel for Track 2. Each Technical Panel filed a report containing the participants' proposals and alternate proposals. The parties then filed comments and reply comments regarding the two Technical Panel reports.

Stage 2 consisted of facilitated all-party workshops where each party's concerns regarding the Technical Panel reports were considered. A total of nine days of workshops were held over a three-month period. Thirty-four parties actively participated in the workshops, including SED, the IOUs, publicly owned electric utilities (POUs), telecommunications companies, cable providers, consumer groups, fire agencies, independent consultants, and one individual. The parties represented at the workshops are listed below:

List of Participants in the Workshops for Phase 3, Tracks 1 and 2
AT&T California (AT&T)
Bear Valley Electric Service, a division of Golden State Water Company (Bear Valley)
California Cable and Telecommunications Association (CCTA)
California Department of Forestry and Fire Protection (Cal Fire)
California Municipal Utilities Association (CMUA)
California Pacific Electric Company, LLC (CalPeco)[1]
The Commission's Safety and Enforcement Division (SED)
Comcast Phone of California, LLC (Comcast)
County of Los Angeles Fire Department (LA County Fire Dept.)
Cox California Telcom, LLC (Cox)
Cox Communications California, LLC (Cox)
Crown Castle NG West, Inc. f/k/a NextG Networks of California, Inc. (Crown Castle)
CTIA-The Wireless Association (CTIA)
Extenet Systems (Extenet)
Frontier Communications (Frontier)
Hans Laetz (Laetz)
Los Angeles Department of Water and Power (LADWP)
Modesto Irrigation District (Modesto)
Mussey Grade Road Alliance (MGRA)
New Cingular Wireless PCS, LLC (Cingular)
Pacific Gas and Electric Company (PG&E)
PacifiCorp d/b/a Pacific Power (PacifiCorp)
Sacramento Municipal Utility District (SMUD)
San Diego Gas & Electric Company (SDG&E)

[1] On September 13, 2013, CalPeco served notice that it had changed its name to Liberty Utilities LLC. This decision will refer to Liberty Utilities LLC as CalPeco for consistency with the record of this proceeding.

List of Participants in the Workshops for Phase 3, Tracks 1 and 2
The Small Local Exchange Carriers (Small LECs)[2]
Southern California Edison Company (SCE)
Sprint Nextel (Sprint)
Sunesys, LLC (Sunesys)
SureWest Telephone (SureWest)
The Utility Reform Network (TURN)
Time Warner Cable (Time Warner)
T-Mobile West Corporation, d/b/a T-Mobile (T-Mobile)
tw telecom of California, lp (TW)
Verizon

During the workshops, the parties considered and discussed all the proposed changes to GO 95 in the Technical Panel 1 Report and the proposed plan for the IOUs to report data on power-line fires to SED (the "Fire Incident Data Collection Plan") in the Technical Panel 2 Report. Opportunities were provided to modify the recommendations in the Technical Panel reports and to suggest additional associated rule changes.

Parties were given an opportunity to request an evidentiary hearing on Track 1 issues and Track 2 issues using the procedures in the Phase 3 Scoping Memo. There were no requests for an evidentiary hearing and none was held.

The workshop process resulted in thoughtful proposals for reducing fire hazards. Much of the credit for the success of the workshops belongs to Administrative Law Judge Minkin who served as the neutral facilitator for the

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[2] The Small LECs are Calaveras Telephone Company, Cal-Ore Telephone Co., Ducor Telephone Company, Foresthill Telephone Co., Happy Valley Telephone Company, Hornitos Telephone Company, Kerman Telephone Co., Pinnacles Telephone Co., The Ponderosa Telephone Co., Sierra Telephone Company, Inc., The Siskiyou Telephone Company, Volcano Telephone Company, and Winterhaven Telephone Company.

Stage 2 workshops. With her guidance, the 34 parties were able to debate dozens of proposals and reach a consensus in important areas. We also thank the workshop participants for their hard work and dedication. We appreciate the cooperation exhibited by all the parties in both the self-directed technical panels and the workshops. Lastly, we extend our thanks to the Workshop Report team for preparing the workshop report summarized below.

2.3. The Workshop Report and Briefs

On May 8, 2013, Sunesys filed and served the *Phase 3 Joint Parties' Workshop Report for Workshops Held January – March 2013* (hereafter, "the Phase 3 Workshop Report" or "Workshop Report") on behalf of the following parties: AT&T and Cingular (AT&T); Bear Valley; CCTA; Cal Fire; CMUA; CalPeco; SED; Comcast; the LA County Fire Dept.; Cox; Crown Castle; CTIA; Extenet; Frontier; Laetz; LADWP; Modesto; MGRA; PG&E; PacifiCorp; SMUD; SDG&E; the Small LECs; SCE; Sprint Nextel; Sunesys; SureWest; TURN; T-Mobile; TW; and Verizon.

The Phase 3 Workshop Report contains 50 proposed regulations. There are 33 consensus proposals in Appendix A of the Workshop Report; 16 contested proposals in Appendix B of the Workshop Report; and the proposed Fire Incident Data Collection Plan in Appendix C of the Workshop Report.

Opening Briefs regarding the Phase 3 Workshop Report were filed on May 22, 2013, by the following parties: A coalition of communication

infrastructure providers (the CIP Coalition),[3] Laetz, the LA County Fire Dept.,[4] MGRA, SED, and a coalition of IOUs.[5] Reply briefs were filed on June 5, 2013, by the CIP Coalition, the IOUs less SDG&E, Laetz, the LA County Fire Dept., MGRA, a coalition of municipal electric utilities (the publicly owned electric utilities or POUs),[6] SED, and SDG&E.

SED's opening brief contained one additional proposal which SED described as a consensus proposal that was mistakenly omitted from the Phase 3 Workshop Report. There was no opposition the proposal in the reply briefs. SED's proposal will be treated as a Consensus Proposal by this decision.

3. Commission Jurisdiction

The purpose of this rulemaking proceeding is to consider and adopt regulations to reduce the fire hazards associated with (1) overhead power-line facilities, and (2) aerial communication facilities located in close proximity to overhead power lines. The California Constitution and the Public Utilities Code provide the Commission with broad jurisdiction to adopt regulations regarding

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[3] The CIP Coalition is comprised of AT&T, CCTA, CTIA, Comcast, Cox, Crown Castle, Extenet, Frontier, the Small LECs, Sprint, Sunesys, SureWest, Sprint, T-Mobile, Time Warner, TW, and Verizon.

[4] The LA County Fire Dept. participated in the Phase 3 workshops and the preparation of the Phase 3 Workshop Report. The County of Los Angeles County Counsel prepared and submitted briefs with assistance from the LA County Fire Dept. and other departments. For simplicity, this decision will use "LA County Fire Dept." to refer to all County of Los Angeles departments that participated in Phase 3.

[5] The IOUs are Bear Valley, CalPeco, PacifiCorp, PG&E, SCE, and SDG&E.

[6] The POUs consist of CMUA, LADWP, and SMUD.

the safety of utility facilities and operations.[7] Utilities are required by Pub. Util. Code § 702 to "obey and comply" with such requirements.[8]

The Commission has enacted an extensive set of safety regulations governing utility facilities and operations, including GO 95. A major goal of GO 95 is to minimize fire hazards.

In addition to the Commission's broad jurisdiction to regulate investor-owned utilities, Pub. Util. Code §§ 8002, 8037, and 8056 provide the Commission with authority to adopt and enforce rules governing electric transmission and distribution facilities of publicly owned utilities (POUs) for the limited purpose of protecting the safety of employees and the general public. Today's decision does not re-visit the Commission's determination in the OIR and the Phase 1 Decision that it may adopt and enforce safety-related regulations for POU electric transmission and distribution facilities.[9]

The Commission's comprehensive jurisdiction over matters of public safety associated with utility facilities extends to attachments to utility poles by CIPs. Specifically, 47 U.S.C. § 224 provides that the Federal Communications Commission (FCC) does not have "jurisdiction [under 47 U.S.C. § 224] with respect to rates, terms, and conditions, or access to poles, ducts, conduits, and rights-of-way as provided in subsection (f) for pole attachments in any case where such matters are regulated by a State." The Commission has certified to the FCC that the Commission regulates such matters in conformance with

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[7] Cal. Constitution, Art. XII, §§ 3 and 6, and Pub. Util. Code §§ 216, 701, 761, 768, 770, 1001, 8037 and 8056. See also *SDG&E v. Cal. Super.* (1996) 13 Cal.4th 893, 923-924.

[8] See also Pub. Util. Code §§ 761, 762, 767.5, 768, 770.

[9] OIR at 6, and D.09-08-029 at 8 – 9 and Conclusion of Law 3.

47 U.S.C. §§ 224(c)(2) and (3).[10] Further, under 47 U.S.C. § 253(b) the Commission may adopt regulations to protect public safety and welfare.

Likewise, the Cable Communications Policy Act of 1984 specifically grants states jurisdiction over cable service in safety matters. (47 U.S.C. § 556(a).) The California Legislature asserted such jurisdiction in Pub. Util. Code § 768.5, which gives the Commission authority to regulate cable companies with respect to the safe operation, maintenance, and construction of their facilities.

4. Criteria for the Adoption of New Regulations

The main purpose of this proceeding is to consider and adopt regulations to reduce the fire hazards associated with overhead power lines and aerial communication facilities in close proximity to power lines. Therefore, in deciding whether to adopt the proposals in the Phase 3 Workshop Report, the primary standard we will use is whether the proposals are likely to reduce fire hazards. This is consistent with the public safety goals articulated in Pub. Util. Code 451, which states, in relevant part, as follows:

> Every public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities, including telephone facilities… as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public.

Because this is a quasi-legislative rulemaking proceeding, today's decision may rely on legislative facts[11] obtained from written submissions in this

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[10] D.98-10-058, 82 CPUC2d 510, 531, as modified by D.00-04-061, 6 CPUC3d 1, 5.

[11] Phase 1 Scoping Memo at 16. A quasi-legislative proceeding establishes policies or rules affecting a class of regulated utilities. (Rule 1.3(d) of the Commission's Rules of Practice and Procedure.) Legislative facts are general facts that help the Commission

Footnote continued on next page

proceeding, such as the Phase 3 Workshop Report and briefs. We may also draw on evidence from past proceedings, our experience and expertise in regulating utilities, our current policies, and common sense.[12]

Pub. Util. Code § 1708.5(f) provides that "the commission may conduct any proceeding to adopt, amend, or repeal a regulation using notice and comment rulemaking procedures, without an evidentiary hearing, except with respect to a regulation being amended or repealed that was adopted after an evidentiary hearing, in which case the parties to the original proceeding shall retain any right to an evidentiary hearing accorded by Section 1708." Notice of OIR 08-11-005 was served on all potential parties, including regulated electric corporations, municipal electric utilities, and CIPs operating in California.[13] Parties were given an opportunity to request an evidentiary hearing regarding the matters that are addressed in this decision using the procedures in the Phase 3 Scoping Memo. No party requested an evidentiary hearing and none was held.

5. Consensus Proposals

5.1. Summary of Proposals

Appendix A of the Phase 3 Workshop Report contains 33 consensus proposals to revise GO 95 (hereafter, "Consensus Proposals"). SED's opening

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to decide questions of law and policy and discretion. (Rule 13.3(c) of the Commission's Rules of Practice and Procedure.)

[12] D.06-06-071 at 26; D.06-12-029 at 13 – 14; D.04-03-041 at 11; and D.99-07-047, 1 CPUC3d 627, 634 – 636.

[13] OIR 08-11-005, at Ordering Paragraph 6.

brief added one more Consensus Proposal. The following table summarizes the 34 Consensus Proposals.

Summary of Consensus Proposals
<u>Consensus Proposal 1</u> re: GO 95, Rule 42, Grades of Construction **Purpose of Rule 42**: This rule specifies "grades of construction" A, B, C, and F, with Grade "A" having the highest safety factors and Grade "F" the lowest. Grade F applies to communications-only facilities. **Proposed Revisions**: Consensus Proposal (CP) 1 eliminates Grade "F" from Rule 42. Grade "C" would become the lowest grade. This change would require new communications facilities to be built with higher safety factors. The elimination of Grade "F" is also reflected in CPs 7, 9, 16, 28, 29, 32, and 33.
<u>Consensus Proposal 2</u> re: GO 95, Rule 43, Temperature and Loading **Purpose of Rule 43**: This rule specifies the ambient temperature, wind load, and ice load that are used to determine the required strength of lines and associated support structures (e.g., poles and towers). **Proposed Revisions**: Consensus Proposal 2 revises Rule 43 to incorporate the term "Lines" that is defined elsewhere in GO 95; clarify that the terms "loading" and "loads" include vertical, transverse, and longitudinal loads; and clarify that the need to obtain the Commission's approval to use other load conditions for the design of lines applies only to "less stringent" conditions.
<u>Consensus Proposal 3</u> re: GO 95, Rule 43.1-C, Heavy Loading Temperature **Purpose of Rule 43.1-C**: This rule requires a temperature of 0 degrees Fahrenheit (ºF) to be used when determining maximum load, 60ºF for computing construction conditions, and 130 ºF for computing sag. **Proposed Revisions**: Consensus Proposal 3 revises Rule 43.1-C so that a conductor temperature of 0ºF shall be assumed at the time of maximum loading and at least 130ºF for computing sag and its effect on structural loads. The temperature that should be assumed during construction is deleted.

<u>Consensus Proposal 4</u> re: GO 95, Rule 43.2-C, Light Loading Temperature **Purpose of Rule 43.2-C**: This rule requires a temperature of 25ºF to be used when determining maximum load, 60 ºF for computing construction conditions, and 130ºF for computing sag. **Proposed Revisions**: Consensus Proposal 4 revises Rule 43.2-C so that a conductor temperature of 25ºF shall be assumed at the time of maximum loading and at least 130ºF for computing sag and its effect on structural loads. The temperature that should be assumed during construction is deleted.
<u>Consensus Proposal 5</u> re: GO 95, Rule 44, Safety Factors **Purpose of Rule 44**: This rule defines the term "safety factors" and describes how safety factors should be applied in determining the required strength of structures and materials. **Proposed Revisions**: Consensus Proposal 5 revises the definition of "safety factors" so that it applies to all materials and line elements under all loading conditions specified in GO 95. The proposal also eliminates the term "maximum working stresses" which is not applicable to those line elements that are designed on the basis of designated load capacities versus stresses. In addition, the proposal adds a new "note" that states the purpose of safety factors is to account for "uncertainties in strengths, loads, design performance, and minor construction deviations."
<u>Consensus Proposal 6</u> re: GO 95, Rule 44.1, Installation and Reconstruction **Purpose of Rule 44.1**: This rule states that newly installed or reconstructed lines and line elements "shall provide as a minimum the safety factors specified in Table 4" of GO 95 for vertical loads, transverse loads, and longitudinal loads. The rule further provides that the design of a structure shall consider the structural loadings and mechanical strength requirements of all facilities that are planned for the structure. **Proposed Revisions**: Consensus Proposal 6 shortens Rule 44.1 to state that newly installed or reconstructed lines and line elements "shall provide as a minimum the safety factors specified in Table 4" and that the design for a structure must consider all facilities that are planned for the structure.

<u>Consensus Proposal 7</u> re: GO 95, Rule 44.1, Table 4 – Safety Factors **Purpose of Table 4**: This table lists the minimum safety factors for newly installed line elements such as poles, crossarms, conductors, and guys for each grade of construction. **Proposed Revisions**: Consensus Proposal 7 revises Table 4 to (1) delete construction Grade "F"; (2) broaden the description of materials and line elements (e.g., change "steel" to "metal"); (3) eliminate redundant provisions; and (4) incorporate non-substantive edits.
<u>Consensus Proposal 8</u> re: GO 95, Rule 44.2, Additional Construction **Purpose of Rule 44.2**: This rule requires an entity planning to add facilities that materially increase the load on a structure to perform a loading calculation to ensure that the additional facilities do not reduce the safety factors below the values in Rule 44.3. **Proposed Revisions**: Consensus Proposal 8 (CP 8) and Consensus Proposal 2 (CP 2) together move the definition of "loads" from Rule 44.2 (CP 8) to Rule 43 (CP 2). CP 8 also includes non-substantive changes to Rule 44.2.
<u>Consensus Proposal 9</u> re: GO 95, Rule 44.3, Replacement **Purpose of Rule 44.3**: This rule requires lines and the parts thereof to be reinforced or replaced before the safety factors drop below the minimum values prescribed by Rule 44.3. **Proposed Revisions**: Consensus Proposal 9 deletes construction Grade "F" from Rule 44.3, consistent with CP 1; clarifies there are multiple reasons why the safety factor at the time of installation may decline over time; adds a "note" that informs the reader that not all safety factors can be reduced by one third or one half; and makes nonsubstantive edits to Rule 44.3.
<u>Consensus Proposal 10</u> re: GO 95, Rule 45, Transverse Strength Requirements, and Rule 45.1, Special Provisions **Purpose of Rules 45 and 45.1**: Rule 45 provides instructions for computing transverse strength requirements. Rule 45.1 provides instructions for the use of guys or special structures to obtain the required transverse strength. **Proposed Revisions**: Consensus Proposal 10 replaces "all parts of structures" in Rule 45 with "lines," a term that is defined by Rule 22.1. The proposal also streamlines Rules 45 and 45.1 by (1) removing text that duplicates other rules; (2) citing other rules; and (3) concisely describing transverse loads.

<u>Consensus Proposal 11</u> re: GO 95, Rule 46, Vertical Strength Requirements

Purpose of Rule 46: This rule provides instructions for computing the vertical strength requirements for poles, towers, foundations, crossarms, etc.

Proposed Revisions: Consensus Proposal (CP) 11 replaces the list of structure components in Rule 46 with the term "lines"; removes text that duplicates other rules; cites other rules; and concisely describes vertical loads. Importantly, CP 11 increases the assumed vertical load for workers and their equipment from 200 lbs. to 300 lbs., which also appears in CPs 19, 20, 23, 24, 26, and 27; and clarifies that the assumed vertical load for workers and their equipment should be applied to one end of the crossarms or guard arms.

<u>Consensus Proposal 12</u> re: GO 95, Rule 47, Longitudinal Strength Requirements

Purpose of Rule 47: This rule states that in computing the longitudinal strength requirements of structures, "the pull of the conductors shall be considered as that due to the maximum working tension in them under the loading conditions specified in Rule 43." Rule 47.1 allows longitudinal stress to be reduced by increasing conductor sag. Rule 47.2 allows longitudinal strength requirements to be met by the structure alone or with the aid of guys or braces. Rule 47.3 requires structures to be sufficiently strong, either by themselves of with the aid of guys or braces, to withstand unbalanced loads.

Proposed Revisions: Consensus Proposal (CP) 12 revises Rule 47 to incorporate the term "Lines" that is defined elsewhere in GO 95, to delete unnecessary text, and to make minor text changes (e.g., changing "guys or braces" to "guys and/or braces." Rules 47.1 and 47.3 are eliminated entirely on the basis that they provide unnecessary advisory language.

<u>Consensus Proposal 13</u> re: GO 95, Rule 48, Ultimate Strength of Materials, and Rule 48.7, Metallic Service and Meter Poles

Purpose of Rules 48 and 48.7: Rule 48 requires, among other things, that the "ultimate strength of materials" shall comply with the safety factors in Rule 44. Rule 48.7 provides instructions for applying the safety factors in Rule 44 to metallic service and meter poles.

Proposed Revisions: Consensus Proposal 13 deletes (1) the word "ultimate" from the title of Rule 48 and the text of Rule 48, and (2) all of Rule 48.7.

<u>Consensus Proposal 14</u> re: GO 95, Rule 48.6, Tower or Pole Foundations and Footings **Purpose of Rule 48.6**: This rule sets the maximum weight of concrete and earth that should be used to calculate the resistance to uplift of foundations of towers, poles, and pole-line structures. Alternatively, the rule allows resistance to uplift to be determined by soil tests. The rule also provides guidance for determining soil resistance to the depression of foundations. **Proposed Revisions**: Consensus Proposal 14 shortens and simplifies Rule 48.6 to state that the calculation of soil resistance to foundation bearing and uplift shall be based on the best available data. The proposal also adds a note that states the design of foundations to resist bearing and uplift shall comply with the safety factors in Rule 44.
<u>Consensus Proposal 15</u> re: GO 95, Rule 49.1-A(1), (2) and (3), Strength **Purpose of Rule 49.1-A(1), (2), and (3)**: Rule 49.1-A and its subparts provide guidance for determining the required strength poles, towers, and structures. **Proposed Revisions**: Consensus Proposal 15 deletes most of the text of Rule 49.1-A, including all of subpart (2), because the deleted text unnecessarily duplicates provisions in Rules 43, 44, and 48. Consensus Proposal 15 also replaces the term "stresses" with "loads" to be more technically correct and to align Rule 49.1-A(3) with proposed changes to Rule 43.
<u>Consensus Proposal 16</u> re: GO 95, Rule 49.1-B, Dimensions **Purpose of Rule 49.1-B**: This rule prescribes the minimum pole-top circumference for wood poles. **Proposed Revisions**: Consensus Proposal 16 deletes from Rule 49.1-B the obsolete construction Grade "F", consistent with CP 1; and replaces references to obsolete ANSI standards dating from 1941 with the current ANSI standard.
<u>Consensus Proposal 17</u> re: GO 95, Rule 49.1-C, Setting of Poles and Table 6 **Purpose of Rule 49.1-C and Table 6**: This rule and table specify how deep poles must be set in the ground. **Proposed Revisions**: Consensus Proposal 17 shortens and simplifies Rule 49.1-C, primarily by deleting advisory language. In addition, the title of Table 6 is revised to clarify that the setting depths are minimums and that the depths specified in the table also apply to non-wood poles.

<u>Consensus Proposal 18</u> re: GO 95, Rule 49.2-A, Materials **Purpose of Rule 49.2-A**: This rule provides guidance regarding the use of wood, metal, concrete, and other materials for crossarms. **Proposed Revisions**: Consensus Proposal 18 adds a reference to Rule 48, eliminates text that is redundant with other rules, and simplifies and broadens the text requiring the use of corrosion resistant treatments and materials.
<u>Consensus Proposal 19</u> re: GO 95, Rule 49.2-C, Strength **Purpose of Rule 49.2-C**: This rule requires crossarms to be supported by braces, as necessary, to prevent excessive tipping of crossarms. **Proposed Revisions**: Consensus Proposal (CP) 19 revises Rule 49.2-C to (1) delete unnecessary text, and (2) require the computation of the vertical load on all crossarms to include 300 lbs. at the outer pin, consistent with CP 11.
<u>Consensus Proposal 20</u> re: GO 95, Rule 49.2-E, Guard Arm **Purpose of Rule 49.2-E**: This rule requires guard arms to be at least 48 inches long and able to withstand a vertical load of 200 lbs. at either end. **Proposed Revisions**: Consensus Proposal (CP) 20 revises Rule 49.2-E to increase the vertical load that guard arms must withstand at either end from 200 lbs. to 300 lbs., consistent with CP 11.
<u>Consensus Proposal 21</u> re: GO 95, Rule 49.4–B, Table 8 **Purpose of Rule 49.4-B, Table 8**: This rule specifies the minimum conductor size for spans of 150 feet or less. The minimum conductor size varies based on grade of construction, type of conductor material, etc. **Proposed Revisions**: Consensus Proposal 21 eliminates construction Grade "F" from Table 8.
<u>Consensus Proposal 22</u> re: GO 95, Rule 49–C(5), Sags and Tensions **Purpose of Rule 49-C(5)**: This rule requires that conductor sag under the loading conditions in Rule 43 shall not cause the tension in conductors to exceed more than one-half of the breaking strength of the conductor. **Proposed Revisions**: Consensus Proposal 22 revises Rule 49-C(5) so that it applies to the sag of unsupported conductors and cables, but not to cables and conductors supported by messengers. A sentence is added that refers the reader to Rule 49.7 for the strength requirements for messengers. Associated revisions are proposed for Rules 49.7-B, 49.7-C, 54.10-E, and 54.10-H.

<u>Consensus Proposal 23</u> re: GO 95, Rule 49.7-B, Strength **Purpose of Rule 49.7-B**: This rule prescribes the required minimum strength for messengers and span wires, including sufficient strength to support a vertical load of 200 lbs. for a worker and cable chair. **Proposed Revisions**: Consensus Proposal (CP) 23 revises Rule 49.7-B to increase from 200 lbs. to 300 lbs. the vertical load that messengers and span wires must be able to support for a worker and cable chair, consistent with CP 11. CP 23 also modernizes terminology in Rule 49.7-B and eliminates advisory information and redundancy in the hardware material requirements.
<u>Consensus Proposal 24</u> re: GO 95, Rule 49.7–C, Supports **Purpose of Rule 49.7-C**: This rule requires the hardware which attaches messengers to poles and crossarms to be able to support, among other things, 200 lbs. associated with a worker and cable chair. **Proposed Revisions**: Consensus Proposal (CP) 24 revises Rule 49.7-C to increase the weight of the worker and cable chair that messenger hardware must be able to support from 200 lbs. to 300 lbs., consistent with CP 11. CP 24 also modernizes terminology in Rule 49.7-C and eliminates advisory information and redundancy in the hardware material requirements.
<u>Consensus Proposal 25</u> re: GO 95, Rule 49.8, Hardware **Purpose of Rule 49.8**: This rule requires hardware to be corrosion resistant. **Proposed Revisions**: Consensus Proposal 25 corrects a grammatical error.
<u>Consensus Proposal 26</u> re: GO 95, Rule 54.10-E(2), Conductor Material and Strength **Purpose of Rule 54.10-E(2)**: This rule states that in cases where a cable chair is not used to maintain multiconductor cables, the additional allowance of 200 lbs. for vertical load specified in Rule 49.7-B may be reduced to 50 lbs. to allow for the load imposed by workers on ladders. **Proposed Revisions**: Consensus Proposal (CP) 26 revises Rule 54.10-E(2) to increase vertical loads to 300 lbs. (from 200 lbs.) and 75 lbs. (from 50 lbs.) to reflect the increased weight of workers and equipment, consistent with CP 11.

<u>Consensus Proposal 27</u> re: GO 95, Rule 54.10-H, Fastenings **Purpose of Rule 54.10-H**: This rule prescribes the strength requirements for hardware used in association with messengers. In cases where cables are not maintained by a worker using a cable chair, Rule 54.10-H states that the mandatory allowance of 200 lbs. for vertical load specified in Rule 49.7-B may be reduced to 50 lbs. to allow for the load imposed by workers on ladders. **Proposed Revisions**: Consensus Proposal (CP) 27 revises Rule 54.10-H to increase the weight allowances cited in Rule 49.7-B to 300 lbs. (from 200 lbs.) and 75 lbs. (from 50 lbs.), consistent with CPs 11 and 26.[14]
<u>Consensus Proposal 28</u> re: GO 95, Rule 81.3-A. Replacement of Wood Poles in Grade F Construction **Purpose of Rule 81.3-A**: This rule provides instructions regarding when Grade "F" wood poles must be replaced. **Proposed Revisions**: Consensus Proposal (CP) 28 replaces Grade "F" in Rule 81.3-A with Grade "C", consistent with CPs 1, 7, 9, 16, 29, 32, and 33.
<u>Consensus Proposal 29</u> re: GO 95, Rule 84.5, Sags **Purpose of Rule 84.5**: This rule requires minimum conductor sag under the specified load conditions to comply with the safety factors in Rule 44, Table 4, and cites GO 95, Appendix C, Table 25, for suggested minimum sags. **Proposed Revisions**: Consensus Proposal (CP) 29 eliminates the citation to Appendix C, Table 25, which lists sags for Grade "F" construction. The elimination of Grade "F" is also reflected in CPs 1, 7, 9, 16, 28, 32, and 33.

[14] CP 27 does not change the word "workmen" to "workers." We assume this omission was inadvertent, as other CPs include this change (*e.g.*, CP 23).

<u>Consensus Proposal 30</u> re: GO 95, Rule 101.2, Spliced or Stub-Reinforced Poles **Purpose of Rule 101.2**: This rule prohibits the use of spliced poles, stub-reinforced poles, and pole-top extensions in crossing or conflicts where Grade "A" construction is required. **Proposed Revisions**: Consensus Proposal (CP) 30 replaces all the text in Rule 101.2 with a reference to Rule 49.1-A(4), which allows the use of spliced poles, stubbed poles, and pole-top extensions. The intent of CP 30 is to correct the inconsistency between Rule 101.2 and Rule 49.1-A(4).
<u>Consensus Proposal 31</u> re: GO 95, Rule 111.3, Spliced or Stub-Reinforced Poles **Purpose of Rule 111.3**: This rule prohibits the use of spliced poles, stub-reinforced poles, and pole-top extensions in crossing or conflicts where Grade "B" construction is required. **Proposed Revisions**: Consensus Proposal (CP) 31 replaces all the text in Rule 111.3 with a reference to Rule 49.1-A(4), which allows the use of spliced poles, stubbed poles, and pole-top extensions. The intent of CP 31 is to correct the inconsistency between Rule 111.3 and Rule 49.1-A(4).
<u>Consensus Proposal 32</u> re: GO 95, Appendix C, Conductor Sag, and Table 25 **Purpose of Appendix C and Table 25**: Appendix C and Table 25, which is part of Appendix C, together provide detailed information regarding the amount of sag that will occur under specified loading conditions and conductor tension that complies with the mandatory safety factor. **Proposed Revisions**: Consensus Proposal (CP) 32 eliminates all references to Grade "F" construction, including all of Table 25. References to Grade "C", the new lowest grade of construction, are added, where appropriate. The elimination of Grade "F" is also reflected in CPs 1, 7, 9, 16, 28, 29, and 33.
<u>Consensus Proposal 33</u> re: GO 95, Appendix D, Typical Communication Line Construction **Purpose of Appendix D**: This appendix provides details of typical communication line construction. **Proposed Revisions**: Consensus Proposal (CP) 33 eliminates a reference to Table 25 in Appendix C, which pertains entirely to Grade "F" construction. The elimination of Grade "F" is also reflected in CPs 1, 7, 9, 16, 28, 29, and 32.

Consensus Proposal 34 re: GO 95, Rule 54.10-G, Sags

Note: This proposal was contained in SED's opening brief.

Purpose of Rule 54.10-G: This rule states, among other things, that in cases where a cable chair is not used to maintain multiconductor cables, the additional allowance of 200 lbs. for vertical load specified in Rule 49.7-B may be reduced to 50 lbs. to allow for the load imposed by workers on ladders.

Proposed Revisions: Consensus Proposal (CP) 34 revises Rule 54.10-G to increase vertical loads to 300 lbs. (from 200 lbs.) to reflect the increased weight of workers and equipment, consistent with CPs 11, 19, 20, 23, 24, 26, and 27.[15]

The proposed revisions to GO 95 for each Consensus Proposal are shown in Appendix A of this decision. The parties expect the proposals will have a negligible financial impact on the affected electric utilities and CIPs.

5.2. Position of the Parties

There is widespread support among the parties for all the Consensus Proposals. No party expressed opposition to any of the proposals.

5.3. Discussion

The criterion we will use to decide if the Consensus Proposals should be adopted is whether the proposals accomplish one of our main objectives for Phase 3, Track 1, of this proceeding, namely, revising GO 95 to reflect modern materials and practices, with the goal of improving fire safety.

With one exception identified below, we find that every Consensus Proposal is consistent with our objective of modernizing GO 95 in a way that improves fire safety. For example, Consensus Proposals 1, 7, 9, 16, 28, 29, 32, and

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[15] SED's CP 34 does not seek to increase the vertical load imposed by workers on ladders to 75 lbs. from 50 lbs. We assume this omission was inadvertent given that other proposals recommend an increase to 75 lbs. from 50 lbs. (*e.g.*, CPs 26 and 27).

33 eliminate from GO 95 the lowest grade of construction (i.e., Grade "F"), which in turn increases the applicable safety factors for communication-only facilities. The higher safety factors will increase the reliability – and thus the fire safety - of the facilities affected by the changed rules. Similarly, Consensus Proposals 11, 19, 20, 23, 24, 26, 27, and 34 revise GO 95 to require stronger poles, crossarms, cables, and other facilities to support heavier workers and worker equipment. These proposals will help protect the safety of workers who are crucial to maintaining reliable facilities and, ultimately, fire safety.

For the preceding reasons, we find all but one of the Consensus Proposals are reasonable in light of the record, consistent with the law, and in the public interest. We therefore adopt the proposals, with one exception. The texts of the revised GO 95 rules are contained in Appendix B of this decision.[16]

We decline to adopt Consensus Proposal 5's recommendation to add a "note" to Rule 44 that states the purpose of safety factors is to account for uncertainties in material strengths, loads, design performance, and minor construction deviations.[17] We are concerned that the proposed "note" would be detrimental to public safety in situations where GO 95 allows a safety factor of 1.0.[18] In these situations, the design strength of the structure is exactly equal to the design loads for the structure. The entire safety factor of 1.0 must be

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[16] This decision adds the word "Rule" to the text of the revised Rules 101.2 and 111.3, so that both rules state "*See* **Rule** 49.1-A(4)." (Emphasis added.)

[17] Rule 44, as revised by this decision in conformance with Consensus Proposal 5, defines "safety factors" as "the minimum allowable ratios of material and/or line element strengths to the effect of design loads as specified in Rule 43."

[18] See, for example, GO 95, Rules 44.3, 47.4, 47.5, 49.2(c)(1)(a), 49.2(c)(1)(b), and 49.3(c)(1)(a).

available to support the design load; none of the safety factor of 1.0 can be taken up by uncertainties in material strengths, loads, design performance, or minor construction deviations as would be allowed by the proposed "note." Otherwise, the structure may fail and thereby ignite a fire, damage or destroy property, and kill or injure people.

6. Contested Proposals

The Phase 3 Workshop Report contains 16 contested proposals for revising GO 95. These proposals are presented in Appendix B of the Workshop Report. We address each contested proposal below.

6.1. Contested Proposal 1 re: GO 95, Proposed Rule 12.1-E and Proposed Rule 44.5

6.1.1. Summary of Proposal

Rule 42 of GO 95, as modified by this decision, establishes three grades of construction - Grades A, B, and C, with "A" being the highest. Grade A poles are joint-use poles that host both communications facilities and electric facilities. Grade B poles are single-use, electric-only poles. Grade C poles are single-use, communications-only poles. In deciding whether to adopt Contested Proposal 1, this decision will focus on Grade A poles and Grade B poles.

Rule 44 and its subparts require new and reconstructed Grade A wood poles to have a safety factor of at least 4.0, which may degrade to 2.67 over the service life of a Grade A wood pole. Grade A wood poles must be reinforced or replaced before the safety factor drops below 2.67. New and reconstructed Grade B wood poles must have a safety factor of at least 3.0, which may degrade to 2.0 over the service life of a Grade B pole. Grade B wood poles must be reinforced or replaced before the safety factor drops below 2.0.

Communications facilities may be attached to a Grade B pole. When this occurs, the pole is reclassified from Grade B (electric-only pole) to Grade A (joint-use pole). In D.12-01-032, the Commission revised Rule 23 of GO 95 to define a change in the grade of construction as "reconstruction." Because Rule 44.1 requires "reconstruction" to have the same safety factor as new construction, the effect of the revised Rule 23 was to require a pole reclassified from Grade B to Grade A due to the addition of communications facilities to meet the safety factors applicable to a new Grade A pole. Consequently, a CIP may attach communications facilities to an existing Grade B wood pole only if the pole has a safety factor of at least 4.0 (i.e., the safety factor applicable to new Grade A construction) after the addition of the CIP's facilities.

Rule 44.1 requires a CIP planning to add communications facilities to a Grade B wood pole to perform a loading calculation to determine if the Grade B wood pole, with the addition of the communications facilities, meets the safety factor requirement of 4.0 for a new Grade A wood pole.

In Contested Proposal 1, the CIP Coalition proposes a new Rule 12.1-E. Under the proposed rule, a pole that is reclassified from Grade B to Grade A due to the addition of communications facilities would not have to meet the safety factor applicable to a new Grade A pole. Instead, the reclassified pole would have to meet the lower safety factor applicable to an in-service Grade A pole and, for wood poles only, either (1) the pole is less than 15 years old, or (2) the pole-loading calculations include results from intrusive pole inspections that were conducted within the last five years. One effect of this proposal would be to reduce the minimum safety factor applicable to wood poles at the time of reclassification from Grade B to Grade A from 4.0 to 2.67 (assuming the pole is

either less than 15 years old or the pole-loading calculations include the results of intrusive inspections conducted in the prior five years).

To gain SED's support for the proposed Rule 12.1-E, the CIP Coalition also proposes a new Rule 44.5 that would require a pole-loading calculation to be conducted after every instructive inspection of a joint-use pole that has undergone a change in grade of construction.

The texts of the proposed Rule 12.1-E and Rule 44.5 are shown in Appendix A of this decision. The CIP Coalition did not provide estimated costs or savings for the proposed rules.

6.1.2. Position of the Parties

The CIP Coalition states that its proposed Rule 12.1-E addresses concerns arising from the implementation of the revisions to Rule 23 that were adopted by the Phase 2 Decision. Because these revisions were characterized as a "clarification," the CIP Coalition did not anticipate the revisions would affect the addition of communications facilities to Grade B poles (i.e., electric-only poles).

The CIP Coalition notes that prior to the adoption of the revised Rule 23, CIPs were allowed to attach communications facilities to Grade B wood poles provided the minimum safety factor of 2.67 for an in-service Grade A wood pole was met. However, since the revised Rule 23 was adopted, certain electric utilities will not allow CIPs to add facilities to Grade B wood poles unless the pole has a safety factor of at least 4.0 after the installation. If the safety factor is less than 4.0, the CIPs must either reinforce the pole to obtain a safety factor of at least 4.0 or install a new joint-use Grade A pole with a safety factor of at least 4.0.

The CIP Coalition argues that the revised Rule 23 has resulted in an unjustified disparity in the safety factors that electric utilities and CIPs must meet when adding facilities to a pole. In particular, electric utilities may add

electric facilities to an existing Grade B pole provided the pole has a safety factor of at least 2.0 after the addition of the electric facilities. In contrast, CIPs may add communications facilities to the same Grade B pole only if the pole has a safety factor of at least 4.0 after the addition of the communications facilities.

Another disparity, according to the CIP Coalition, is the preferred treatment the revised Rule 23 provides to entities that add facilities after the first CIP. While the first CIP to attach communications facilities to a Grade B wood pole must ensure the pole has a safety factor of at least 4.0, all subsequent attachments by electric utilities or CIPs must have a safety factor of only 2.67.

The CIP Coalition submits that its proposed Rule 12.1-E will treat electric utilities and CIPs equally with respect to pole attachments. The proposed rule also promotes the efficient use of infrastructure by avoiding the unnecessary upgrade or replacement of poles that satisfy the minimum safety factors for in-service Grade A poles.

The CIP Coalition characterizes its proposed Rule 44.5 as complementing its proposed Rule 12.1-E. Together, the two rules will enhance fire safety by requiring that the combined effects of load and deterioration be taken into account for poles for which there is a change of grade, both at the time that facilities are added to a pole and over time as the pole ages.

The CIP Coalition estimates its proposed Rule 12.1-E will result in costs savings because it will avoid the premature replacement of poles. The costs to implement Rule 44.5 are unknown; however the CIP coalition asserts the costs will be limited to the expense of performing load calculations immediately following intrusive inspections of poles that have had an increase in grade.

The CIP Coalition's proposal is supported by the LA County Fire Dept. and SED. These two parties agree that proposed Rule 12.1-E will help ensure

that the pole to which facilities are being added is relatively new or that recent intrusive inspection results are used in determining the safety factor at the time of installation. They also view proposed Rule 44.5 as an important step towards ensuring that the strength of every pole at the time of an intrusive inspection is adequate for the loads carried by the pole. SED notes that GO 95 currently requires pole owners to use intrusive inspection results to evaluate the remaining strength of the pole, but there is no requirement to connect the strength of the pole to the load that is on the pole. This creates a potential for poles to pass the intrusive inspection but lack the minimum safety factor.

Hans Laetz and the IOUs oppose the proposed Rule 12.1-E. They argue that the proposed rule would negatively affect public safety by reducing the safety factors applicable to poles that are reclassified from Grade B to Grade A due to the addition of communications facilities. The IOUs postulate that the motivation for the CIP Coalition's proposed Rule 12.1-E is to shift costs to electric utilities. If adopted, the proposal would allow CIPs to increase load on existing poles without a corresponding increase in pole strength, thereby shortening the pole's life. Ratepayers of electric companies would bear the costs of early pole replacements for the benefit of CIPs.

Laetz argues that to the extent there is disparity regarding the treatment of electric utilities compared to CIPs with respect to existing Grade B poles, the appropriate remedy is to increase the safety standards for electric utilities rather than decrease safety standards for CIPs.

SDG&E recommends that if the Commission adopts proposed Rule 12.1-E, the text of the rule would be more appropriately placed in Rule 44, which directly addresses the required safety factors for various grades of construction,

rather than in Rule 12, which concerns the general applicability of all rules in GO 95.

The IOUs and POUs oppose the proposed Rule 44.5. The proposed rule would require them to develop and implement programs to identify and track joint-use poles that have undergone a change in grade of construction, and then for these poles only, perform a pole-loading calculation each time an intrusive inspection is performed. This would further shift costs to electric ratepayers, rather than where the costs belong – the beneficiary of the attachment.

The IOUs assert that proposed Rule 44.5 would not enhance public safety. The POUs go further, and declare that the proposed rule would be detrimental to public safety because implementation of Rule 44.5 would divert employees and resources from more important safety-related tasks.

The IOUs disagree with SED's argument that there is a potential for poles to pass an intrusive inspection, but still not meet the minimum safety factor requirements. The IOUs state that SED does not cite any audits, incidents, or other information that shows this situation is happening. The fact that there is a "potential" is not enough to justify a costly new regulation.

6.1.3. Discussion

The issue before us is the whether to adopt the CIP Coalition's proposed Rules 12.1-E and 44.5. In deciding this issue, our paramount concern is the prevention of fires caused by the failure of overloaded utility poles. We first address proposed Rule 12.1-E, followed by proposed Rule 44.5.

6.1.3.1 Proposed Rule 12.1-E

As a preliminary matter, we disagree with the CIP Coalition's suggestion that the revisions to Rule 23 that were adopted by the Phase 2 Decision have had the unforeseen effect of applying the safety factors for new construction to a

change in the grade of construction. The Phase 2 Decision stated explicitly that the "revisions to Rule 23.0 have the effect of applying the safety factors for new construction in Rule 44.1 to a 'change to an existing grade of construction or class of circuit.[19]'" The effect of the revised Rule 23 is that when a pole is reclassified from Grade B to Grade A due to the addition of communications facilities, the reclassified pole must comply with the safety factors for new Grade A construction. The purpose of the revised Rule 23 is to promote public safety.[20]

The CIP Coalition's proposed Rule 12.1-E would reduce the safety factors for utility poles that are reclassified from Grade B to Grade A due to the addition of communications facilities. For example, under the CIP Coalition's proposal, the minimum safety factor applicable to a newly reclassified Grade A wood pole would be reduced from 4.0 to 2.67.

With one exception described below, we decline to adopt the CIP Coalition's proposed Rule 12.1-E because it would lower the minimum safety factor for newly reclassified Grade A poles. A lower safety factor would make newly reclassified Grade A poles more susceptible to failure and thereby increase the potential fire hazard associated with Grade A poles. Such a result would be contrary to the primary goal of this proceeding of enhancing fire safety.

We are not persuaded by the CIP Coalition's argument that its proposed Rule 12.1-E would enhance safety with a purported "new requirement" for CIPs to include in their loading calculations for the planned addition of

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[19] D.12-01-032 at 24.

[20] D.12-01-032 at 26.

communications facilities to an existing Grade B pole the results of intrusive inspections[21] that were conducted within the last five years (unless the pole is too new to require such results). We believe that CIPs are already required by Pub. Util. Code § 451 and GO 95, Rules 11, 31.1, 44.2, and 44.4, to use intrusive inspections data in their pole-loading calculations[22] (to the extent the inspections were performed and the results are available). Consequently, the CIP Coalition's proposal is not a "new requirement" and does not enhance public safety.

We are dismayed that the CIP Coalition apparently interprets GO 95 in a way that allows CIPs to avoid using intrusive inspection results when performing loading calculations to determine if a pole can support additional communications facilities. Intrusive inspections provide vital information

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[21] GO 95, Rule 80.1-B, defines "intrusive inspections as "as an inspection involving movement of soil, and/or using more sophisticated diagnostic tools beyond visual inspections or instrument reading."

[22] Pub. Util. Code Sec. 451 requires "[e]very public utility [to] furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities… as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public." Rule 11 of GO 95 states that the purpose of GO 95 "is to formulate… requirements for overhead line design, construction, and maintenance, the application of which will ensure adequate service and secure safety to persons engaged in the construction, maintenance, operation or use of overhead lines and to the public in general." Rule 31.1 require for "all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice…." Rule 44.2 requires "[a]ny entity planning the addition of facilities that materially increase vertical, transverse or longitudinal loading on a structure [to] perform a loading calculation to ensure that the addition of the facilities will not reduce the safety factors below the values specified by Rule 44.3." Rule 44.4 requires "[a]ll entities with facilities on the subject pole shall cooperate with the company performing the load calculations necessitated by the provisions of Rule 44.1, 44.2 or 44.3, including, but not limited to, promptly providing or making reasonably available, upon request and to the extent it exists, the… most recent intrusive pole test data…."

regarding the remaining strength of a pole and the pole's ability to support additional facilities. The failure to use such information in pole-loading calculations, when it is available, poses a significant risk to public safety.

So that it is clear that intrusive inspection data must be used in loading calculations for the planned addition of facilities to a pole, we will adopt the CIP Coalition's proposed Rule 12.1-E to the limited extent the proposed rule explicitly requires the use of intrusive test data in loading calculations for new additions to a pole. However, consistent with SDG&E's recommendation, we will incorporate this requirement in Rule 44.2. The revised text of Rule 44.2 is shown below with bold font and underline:

> **44.2 Additional Construction**
>
> Any entity planning the addition of facilities that materially increases on a structure shall perform a loading calculation, to ensure that the addition of the facilities will not reduce the safety factors below the values specified by Rule 44.3. **The loading calculation shall incorporate the most recent intrusive inspection data, if it exists and is available**. Such entity shall maintain these loading calculations for ten years and shall provide such information to authorized joint use pole occupants and the Commission upon request.[23]

There should be no additional costs associated with the revised Rule 44.2, as electric utilities and CIPs should already be complying with its requirements. To the extent there are increased costs, we conclude that such costs are more than offset by the public safety benefits of the revised rule.

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[23] This revised Rule 44.2 includes the revisions to Rule 44.2 in Consensus Proposal 8 that were adopted previously in this decision. Additional revisions to Rule 44.2 are adopted later in this decision.

The CIP Coalition argues unpersuasively that its proposed Rule 12.1-E will avoid unnecessary reinforcement or replacement of Grade B poles to obtain the safety factors associated with newly installed Grade A poles. Although it is true the proposal would avoid the immediate cost to reinforce or replace some Grade B poles, the proposal would foreseeably result in thousands of poles with lower safety factors compared to existing regulations. Again, such a result is contrary to the goals of this proceeding.

The CIP Coalition argues unpersuasively that it is unfair that electric utilities can attach additional electric facilities to a Grade B pole if the safety factor for the pole, with the added facilities, is at least 2.0. In contrast, CIPs cannot attach communications facilities to the same Grade B pole unless the pole, with the added facilities, has a safety factor of at least 4.0. We find this argument conflates apples and oranges. Grade B poles are single-use poles that host electric facilities. In contrast, Grade A poles are joint-use poles that host both electric and telecommunications facilities. The Commission has long recognized that Grade A joint-use poles require a higher safety factor than Grade B single-use poles. Consequently, when a CIP attaches communications facilities to an existing Grade B pole, the pole is automatically reclassified to a Grade A pole and the higher safety factors associated with joint-use Grade A poles apply.

We find some merit to the CIP Coalition's argument that it is unfair that the first CIP to attach facilities to a Grade B wood pole must ensure the pole has a safety factor of at least 4.0, while all subsequent attachments by electric utilities or CIPs must have a safety factor of only 2.67. We disagree, however, that the appropriate solution is to lower safety standards. One possible solution that protects public safety would be to devise a cost-sharing arrangement whereby entities that attach to a Grade B pole that is upgraded to Grade A standards by

the first attaching CIP to bear a fair share of the upgrade costs. However, no cost-sharing arrangement was proposed by any party, so we do not address this matter in today's decision.

6.1.3.2 Proposed Rule 44.5

The CIP Coalition's proposed Rule 44.5 would require a pole-loading calculation each time an intrusive inspection is performed on a wood pole that was previously reclassified from a single-use pole to a joint-use pole. With the intrusive inspection and the pole-loading calculation in hand, the pole owner could determine if the pole needed to be reinforced or replaced.

We are not convinced that it is in the public interest to adopt proposed Rule 44.5. Pole owners are already obligated by Rule 44.3 to reinforce or replace a pole before the pole's safety factor falls below the minimum requirement. The CIP Coalition and SED provided no information that shows pole owners are not meeting their obligations under Rule 44.3. Yet despite the lack of a demonstrated need, the proposed Rule 44.5 would prescribe for a narrow subset of installed poles (i.e., poles that have undergone a change in grade of construction) the precise method that should be used to determine if a pole needs to be reinforced or replaced (i.e., a pole-loading calculation) at one particular point in time (i.e., when an intrusive inspection is performed).[24] The proposed Rule 44.5 would not apply to single-use Grade B poles and Grade C poles, or to joint-use Grade A

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[24] Currently, intrusive inspections are required sometime during the first 15 - 25 years of a wood pole's service life and, if the pole passes an inspection, every 20 years thereafter. (GO 95, Rule 80.1-B and GO 165, Table 1.) Intrusive inspection requirements apply to Grade A poles, Grade B electric-only poles, and a subset of communications-only poles in high fire-threat areas of southern California.

poles that were originally installed as Grade A poles. We agree with the IOUs and POUs that this piecemeal approach to compliance would be burdensome to implement, with no clear benefits for public safety.

6.2. Contested Proposal 2 re: GO 95, Proposed Rule 31.7

6.2.1. Summary of Proposal

The Federal Aviation Administration (FAA) has determined that structures which exceed a height of 200 feet above ground level (AGL) are a hazard to aviation and should be marked in accordance with FAA Advisory Circular (AC) 70/7460-1K.[25] Depending on circumstances, the FAA may exempt particular structures that exceed 200 feet AGL from marking requirements, or apply these requirements to structures that are less than 200 feet AGL.

Hans Laetz, an individual, proposes to add a new Rule 31.7 to GO 95 that would apply the marking requirements in the FAA's AC 70/7460-1K to all utility structures and lines that (1) exceed 100 feet AGL, or (2) cross a paved road and exceed a height of 50 feet above the road, with certain exceptions. The text of proposed Rule 31.7 is shown in Appendix A of this decision. Laetz did not provide a cost estimate for the proposed rule.

6.2.2. Position of the Parties

Hans Laetz, the sole supporter of Contested Proposal 2, contends that proposed Rule 31.7 is necessary because of the many power lines in high fire-risk areas of the State, including mountainous regions where transmission lines

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[25] Hereafter, the term "marking" as used in this decision refers to FAA requirements for marking of aviation hazards. Depending on the hazard, marking may include observation balls, paint schemes, steady-burn lights, and/or flashing lights.

sometimes span deep canyons high above ground level. Laetz represents that high-span lines are oftentimes not marked to alert aviators.

Laetz states that although the FAA has marking requirements for lines that exceed 200 feet AGL, there are no federal or state marking requirements for high-span lines below 200 feet AGL. Laetz declares that unmarked high-span lines are a hazard to aircraft. Californians are placed at risk from fires ignited by aircraft collisions with unmarked high-span lines, a risk that is compounded by the hazards to, and limitations placed upon, low flying firefighting aircraft.

Laetz provides several anecdotes to support his proposal. First, on January 5, 2010, a helicopter chartered by the California Department of Fish and Game hit an unmarked high-span line, killing all four aboard. Second, Laetz represents that during the October 2007 fires, airdrops by firefighting aircraft in the Malibu area were called off due to the pilots' inability to see high-span lines. Finally, Laetz has witnessed medical rescue helicopters transiting the fire-prone canyons of the Santa Monica Mountains that are laced with high-span lines.

Contested Proposal 2 is opposed by the CIP Coalition, the IOUs, and SED. The opponents argue that proposed Rule 31.7 is an improper intrusion into the FAA's sphere of jurisdiction. They note that the Commission has recognized the FAA's jurisdiction over the marking of utility structures and lines.[26]

6.2.3. Discussion

The FAA generally requires structures that exceed a height of 200 feet AGL to be marked in accordance with the FAA's AC 70/7460-1K. The FAA may

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[26] See D.12-11-026 wherein the Commission granted a petition to modify D.07-01-040 regarding the Devers Palo Verde No. 2 Transmission Project to comply with the FAA's recommendations for marking certain transmission line towers and spans.

exempt structures from this requirement on a case-by-case basis, or require a structure that does not exceed 200 feet AGL to be marked because of its location.

The proposed Rule 31.7 would apply the marking requirements in the FAA's AC 70/7460-1K to (1) utility structures and lines over 100 feet AGL, and (2) utility structures and lines over 50 feet AGL that cross any road, with certain exceptions. The intent of the proposed rule is to reduce the hazard to aviation posed by overhead utility lines and associated structures. Fire safety would be enhanced by reducing the risk of aircraft colliding with power lines, and by improving the ability of firefighting aircraft to operate safely at low altitude in areas where overhead power lines are present.

Although the proposed Rule 31.7 is well intentioned, we decline to adopt the proposal for the following reasons. First, the FAA has regulatory oversight of aviation safety nationwide.[27] To this end, the FAA has promulgated regulations for marking structures that pose a hazard to aviation such as AC 70/7460-1K. We presume the FAA's marking regulations were devised by competent regulators with expertise in aviation safety. Therefore, as a general principle, we should defer to the FAA's marking regulations.

Second, Laetz's proposal would apply to all utility structures and lines that exceed 100 feet AGL, including many structures for which the FAA has conducted an aeronautical study that found the structure is not a hazard to air navigation and does not need to be marked for aviation safety. The following

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[27] See, for example, 49 USC § 40103(a)(1) ("The United States Government has exclusive sovereignty of airspace of the United States."); and 49 USC § 40103(b)(1) ("[The FAA] shall develop plans and policy for the use of navigable airspace… necessary to ensure the safety of aircraft and the efficient use of airspace.").

table lists recent FAA aeronautical studies which determined that particular utility structures did not need to be marked for aviation safety:

Recent FAA Aeronautical Studies that Have Found No Hazard to Air Navigation and that Marking is Not Necessary for Aviation Safety				
Utility	**Structure**	**Structure Height AGL**	**FAA Study No.**	**Date FAA Study Issued**
PG&E	Transmission Line (TL) Tower	128 Feet AGL	2013-AWP-503-OE	Feb. 14, 2013
PG&E	TL Tower	138 Feet AGL	2013-AWP-529-OE	Feb. 8, 2013
PG&E	TL Tower	138 Feet AGL	2013-AWP-502-OE	Feb. 8, 2013
PG&E	TL Tower	127 Feet AGL	2013-AWP-500-OE	Feb. 8, 2013
PG&E	TL Tower	138 Feet AGL	2013-AWP-532-OE	Feb. 6, 2013
PG&E	TL Tower	154 Feet AGL	2013-AWP-522-OE	Feb. 6, 2013
PG&E	Tower	146 Feet AGL	2013-AWP-527-OE	Feb. 5, 2013
PG&E	Tower	131 Feet AGL	2012-AWP-7542-OE	Oct. 25, 2012
PG&E	Tower	132 Feet AGL	2012-AWP-7541-OE	Oct. 25, 2012
SDG&E	Transmission Line	112 Feet AGL	2012-AWP-6706-OE	Sept. 20, 2012
SDG&E	Transmission Line	117 Feet AGL	2012-AWP-6697-OE	Sept. 20, 2012
SCE	Transmission Line	117 Feet AGL	2012-AWP-6690-OE	Sept. 20, 2012
SCE	Transmission Line	122 Feet AGL	2012-AWP-5839-OE	Aug. 27, 2012
SCE	Transmission Line	122 Feet AGL	2012-AWP-5837-OE	Aug. 27, 2012
SCE	Utility Pole	106 Feet AGL	2012-AWP-5415-OE	Aug. 10, 2012
SCE	Utility Pole	106 Feet AGL	2012-AWP-5414-OE	Aug. 10, 2012
We take official notice of the above-listed FAA aeronautical studies on our own motion pursuant to Pub. Util. Code §§ 701 and 1701, and Rule 13.9 of the Commission's Rules of Practice and Procedure.				

There are many more FAA aeronautical studies of utility structures that exceed 100 feet AGL wherein the FAA determined that marking is not necessary for aviation safety.[28] Proposed Rule 31.7 would disregard the FAA's determinations and require that such structures be marked. We do not believe it is reasonable to require utility structures to be marked in cases where an FAA aeronautical study has determined that marking is not needed for aviation safety.

Finally, in order to adopt proposed Rule 31.7, we would necessarily have to find that the FAA's existing marking regulations for utility structures and lines do not protect public safety adequately. The only record we have for making this finding was provided by Hans Laetz, who is not a recognized expert on aviation safety. In our judgment, we do not have a sufficient record at this time to proclaim the FAA's marking regulations do not protect public safety adequately.

6.3. Contested Proposal 3A re: GO 95, Rule 44.2

6.3.1. Summary of Proposal

Rule 44.2 requires an entity planning to add facilities to a structure that materially increases the load on the structure to perform a loading calculation to ensure that the additional facilities do not reduce the safety factors for the structure below the minimum values specified in Rule 44.3.

SED's Contested Proposal 3A would require the aforementioned loading calculation to be based on the existing condition of the structure, proposed

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[28] FAA aeronautical studies are available online at https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=showSearchArchivesForm.

configuration, information provided by other entities per Rule 44.4, conservative values of relevant parameters, industry recognized values of relevant parameters, or any combination thereof.

SED anticipates the cost of its proposal will be negligible. The text of SED's proposed revisions to Rule 44.2 is contained in Appendix A of this decision.[29]

6.3.2. Position of the Parties

SED states that loading calculations are crucial for determining if existing structures can safely support additional facilities. SED's proposal would enhance public safety by requiring loading calculations to use relevant and accurate data.

SED represents that its proposal stems from safety audits and incident investigations where SED has come across loading calculations that use inaccurate measurements, apply incorrect parameters, and/or do not reflect all attached facilities. The inaccurate calculations are shared with other utilities and CIPs, in accordance with Rule 44.4, who then use the inaccurate information to update their own loading calculations when adding facilities.

SED's proposal is supported by the CIP Coalition, Laetz, the LA County Fire Dept., the POUs, and SDG&E. Although Laetz supports SED's proposed revisions to Rule 44.2, he also recommends two additional revisions to Rule 44.2 that are addressed later in this decision in the context of Contested Proposal 3B.

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[29] SED's proposal to revise Rule 44.2 includes the revisions to Rule 44.2 that were adopted previously in this decision as part of Consensus Proposal 8.

SDG&E avers that the SED's proposed revisions to Rule 44.2 are commonsensical. SDG&E states that the source data referenced in SED's proposal represent the data that SDG&E normally uses for loading calculations.

Contested Proposal 3A is opposed by all the IOUs except SDG&E. The opposing IOUs claim that SED's proposed revisions to Rule 44.2 are unnecessary, overly prescriptive, add no value to the understanding or application of GO 95, and do not reflect modern engineering practices.

6.3.3. Discussion

Loading calculations are essential for determining if an existing structure can safely support the planned addition of facilities, or if the structure needs to be reinforced or replaced before the planned facilities are added.

It is imperative to public safety that electric utilities and CIPs use relevant and accurate information in their loading calculations. SED's proposed revisions to Rule 44.2 will help ensure that appropriate information is used. There is no dispute that the cost of SED's proposal will be negligible.

We conclude for the previous reasons that SED's proposed revisions to Rule 44.2 are reasonable, and we hereby adopt them. The text of Rule 44.2, as revised by this decision, is contained in Appendix B of this decision.[30]

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[30] The text of revised Rule 44.2 reflects Consensus Proposal 8 and Contested Proposal 3A adopted by this decision, as well as revisions to Rule 44.2 that we adopt as part of our decision on Contested Proposals 1 and 3B. We also revise the adopted text of Rule 44.2 to change "pole-loading calculation" to "loading calculation," and "joint use pole occupant" to "joint-use occupant."

6.4. Contested Proposal 3B re: GO 95, Rule 44.2

6.4.1. Summary of Proposal

Rule 44.2 of GO 95 requires any entity planning to add facilities to a structure that materially increases the load on the structure to (1) perform a loading calculation to ensure that the additional facilities do not reduce the safety factors for the structure below the minimum values specified in Rule 44.3, and (2) keep records of such loading calculations for 10 years.

Laetz's Contested Proposal 3B would revise Rule 44.2 to require (i) the loading calculations to be based on the existing condition of the structure "as reasonable verified by field observations," and (ii) the retention of loading calculations for "the life of the equipment." The text of the proposed revisions to Rule 44.2 is contained in Appendix A of this decision.[31] Laetz acknowledges that his proposal would entail additional costs for entities that perform loading calculations, but Laetz did not provide an estimate of the additional costs.

6.4.2. Position of the Parties

Laetz states that his proposal to require an entity that adds facilities to a pole to certify that its loading calculations are based on the actual physical condition of the structure "as reasonably verified by field observations" will enhance public safety because accurate loading calculations are essential for ensuring that the addition of facilities does not overload a structure.

Laetz explains that his proposal arises from statements by SED during the Phase 3 workshops that (1) SED's safety audits have found that the actual

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[31] Laetz's proposed revisions to Rule 44.2 include the revisions to Rule 44.2 contained in Consensus Proposal 8 and Contested Proposal 3A.

condition of poles, including the number and types of attached facilities, does not always match the records that electric utilities and CIPs use for their loading calculations; and (2) erroneous loading calculations have led to failures and fires.

Laetz submits that his proposal to require loading calculations to be retained for the life of the equipment would enhance fire safety by preserving records for structures that can remain in service for 50 to 100 years. Such records would be useful for Commission investigations of structures that fail.

No party expressed support for Contested Proposal 3B. The proposal is opposed by the CIP Coalition, the IOUs, the LA County Fire Dept., and the POUs. SED opposes the proposed requirement to verify the condition of poles through field observations. SED did not express a position on the proposed record retention requirement.

The CIP Coalition argues that the proposed "field verification" requirement presupposes, without any evidence, that pole records are unreliable. Further, the proposal wrongly assumes that field personnel will have the requisite knowledge to identify and match the equipment attached to a pole to the database record of equipment for that pole. While field personnel can identify equipment they are trained to install and maintain, they cannot be expected to accurately identify the specific equipment owned by other entities.

The CIP Coalition also asserts that the proposal does not provide clear guidance for compliance with the "field verification" rule. The CIP Coalition is concerned that CIPs would have to create and retain written documentation, pictures, or videos of conditions antecedent to installation. Such means of verification would impose an undue burden on field operations.

The POUs state there are many situations where field observations are not required, such as when a recent pole-loading calculation for a previous installation is available and there have been no changes to the pole since then.

SED agrees that requiring field observations would be burdensome for electric utilities and CIPs. It would also be difficult for SED to enforce, as it is unclear how SED would determine if an electric utility or CIP has "reasonably verified" the condition of facilities used in loading calculations.

The CIP Coalition, the IOUs, and the POUs argue that requiring all loading calculations to be retained for the life of the equipment would be excessively burdensome, as it would result in a record retention period that can reach 100 years. They assert that it is pointless to retain loading calculations indefinitely because the calculations become obsolete as structures age. For example, if a loading calculation is done when a facility is added to a pole, and no further activity occurs for the next 40 years, the loading calculation would have little relevance to the current condition of the pole because of the natural deterioration of the pole over the 40-year period.

The CIP Coalition states that keeping a large quantity of records for decades also imposes significant burdens. The most substantial effort would involve the isolation of loading-related records from construction work plans and records. Most CIPs do not have that information isolated, so new systems would have to be developed and maintained.

6.4.3. Discussion

Contested Proposal 3B would add two new requirements to Rule 44.2 of GO 95. We address each proposed requirement below.

6.4.3.1 Field Verification of Existing Conditions

The first proposed requirement would mandate that the loading calculation for the planned addition of facilities to a utility pole be based on the existing condition of the pole "as reasonably verified by field observations." The purpose of this requirement is to ensure that the loading calculation reflects the actual condition of the pole, including all facilities attached to the pole.

We agree with Laetz that loading calculations must accurately reflect the condition of the poles. The failure to do so could result in overloaded poles which, in turn, increases the risk that poles will fail. The failure of an overloaded pole poses a major threat to public safety, as it could damage nearby property, injure and kill people, and ignite a catastrophic wildfire in a worst case scenario.

The record of this proceeding indicates that loading calculations using erroneous data are not rare. SED represents that inaccurate loading calculations "are routinely evidenced as SED staff performs audits and incident investigations in which it analyzes pole loading calculations that have numerous inaccurate measurements, apply incorrect parameters, and even have missing facilities.[32]"

Although we agree with the intent of Laetz's proposal, we believe the proposal is unnecessary in light of the revisions to Rule 44.2 that were adopted previously in this decision as part of SED's Contested Proposal 3A. The revised Rule 44.2 effectively requires electric utilities and CIPs to use accurate information and/or conservative values in their loading calculations.

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[32] SED Opening Brief on the Workshop Report for Phase 3, Tracks 1 and 2, at 8 – 9.

Laetz's proposal would add a new requirement that the inputs to loading calculations be "reasonably verified by field observations." We believe this requirement would be unduly burdensome in many situations. For example, a CIP planning to attach facilities to a wood pole owned by an IOU would have to perform a loading calculation for the proposed attachment pursuant to Rule 44.2. Depending on circumstances, the information needed for the calculation could include the tree species of the wood pole; the pole's age, diameter at ground level, taper, and height above ground level; the number of power lines attached to the pole; and for each power line, the line's length, circumference, weight, angle of attachment, height of attachment, and tension. Much of this information would be provided to the CIP by the IOU pursuant to Rule 44.4.

The CIP would have to spend considerable time and effort to verify by field observations the information provided by the electric utility. In many situations it may be more efficient and just as safe to use conservative values for the parameters used in pole-loading calculations rather than verifying each parameter through field observations. However, Laetz's proposal would mandate field observations when the use of conservative parameters is sufficient.

6.4.3.2 Retention of Loading Calculations

Rule 44.2 requires loading calculations for the planned addition of facilities to be retained for 10 years. Laetz proposes that such calculations be retained for "the life of the equipment."

The Commission uses loading calculations to investigate pole failures. Such information can help identify the root causes of failures and devise appropriate remedies, ranging from penalties for pole owners to amending GO 95. Laetz's proposal will provide information that is relevant to

investigations of pole failures, which should improve public safety over time. Therefore, we will adopt the proposal, with one modification described below.

The opponents argue that loading calculations become obsolete as poles deteriorate. This argument overlooks that old calculations may be relevant to investigations of recent pole failures. For instance, examining a loading calculation that was done 40 years ago when a facility was added to a pole may reveal that the calculation was erroneous, resulting in an overloaded pole.

The opponents further argue that loading calculations become obsolete when new calculations are performed as facilities are added to a pole. This argument overlooks that new calculations often rely on the information provided by old calculations, according to SED.[33] Any errors in an old calculation may be inherited by new calculations. The error may be propagated further as a new calculation is performed each time a facility is added to the pole.[34] Having access to all the old loading calculations could help pinpoint where the error first occurred in a chain of loading calculations. Such information could be useful in assessing penalties and devising other remedial measures.

Finally, the opponents argue that retaining loading calculations for more than 10 years would be unduly burdensome. We acknowledge that a requirement to retain records of loading calculations for more than 10 years will impose additional costs. However, we do not believe the costs will be onerous. Electric utilities and CIPs are already required to maintain records of all their poles, their facilities attached to poles, and intrusive inspection data for the life of

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[33] SED Opening Brief on the Workshop Report for Phase 3, Tracks 1 and 2, at 8 – 9.

[34] It is not unusual for a pole to have facilities attached by five or more entities.

the poles. It should not be unreasonably burdensome to maintain parallel records of loading calculations. In our judgment, the additional cost to maintain loading calculations is outweighed by the public safety benefits that will accrue from having such information available for investigations of pole failures.

Our only concern with Laetz's proposed record keeping requirement is that it requires loading calculations to be retained for "the life of the equipment." The phrase "life of the equipment" is unclear because the loading calculation is performed for the pole and not the equipment. So that the record retention requirement is clear, we will revise Rule 44.2 to require loading calculations to be retained for the service life of the pole for which the pole-loading calculations were made. The changes to the text of Rule 44.2, as revised previously in this decision, are shown below with bold font, underline, and/or strikeout:

44.2 Additional Construction

Any entity planning the addition of facilities that materially increases loads on a structure shall perform a loading calculation to ensure that the addition of the facilities will not reduce the safety factors below the values specified by Rule 44.3. Such loading calculations shall be based on existing condition and proposed configuration, information provided under Rule 44.4, conservative values of relevant parameters, industry recognized values of relevant parameters, or any combination thereof. The loading calculation shall also incorporate the most recent intrusive inspection data, if it exists. Such entity shall maintain these loading calculations for **the service life of pole or other structure for which a loading calculation was made** ~~**ten years**~~ and shall provide such information to authorized joint-use occupants and the Commission upon request.

We note that the newly adopted record-retention requirement applies only to "additional construction" that is the subject of Rule 44.2. There is no similar record-retention requirement for new installations and reconstruction that are the subject of Rule 44.1. We conclude that our reasons for adopting a revised

record-retention requirement for the loading calculations related to "additional construction" apply equally to the loading calculations related to new installations and reconstruction. Therefore, we will revise Rule 44.1 to incorporate a record-retention requirement for loading calculations that mirrors our revisions to Rule 44.2. The changes to the text of Rule 44.1, as revised previously in this decision, are shown below with bold font and underline:

44.1 Installation and Reconstruction

Lines and elements of lines, upon installation or reconstruction, shall provide as a minimum the safety factors specified in Table 4. The design shall consider all supply and communication facilities planned to occupy the structure. For purposes of this rule, the term "planned" applies to the facilities intended to occupy the structure that are actually known to the constructing company at the time of design.

The entity responsible for performing the loading calculation(s) for an installation or reconstruction shall maintain records of these calculations for the service life of the pole or other structure for which a loading calculation was made and shall provide such information to authorized joint-use occupants and the Commission upon request.

6.5. Contested Proposal 4 re: GO 95, Rule 46

6.5.1. Summary of Proposal

Rule 46 of GO 95 provides guidance for computing the vertical strength requirements of poles, towers, foundations, crossarms, pins, and other line elements. Laetz proposes to revise Rule 46 to include a new requirement that the "predicted safety factor for any particular wooden structure shall be reduced by a percentage equal to the product of the angle, measured in degrees, that the pole deviates from its design at the point of peak deviation, and 4.0." For example, if

a pole is designed to be vertical but leans 5 degrees, the calculated safety factor for the pole would be reduced by 20% (i.e., 5 degrees multiplied by 4.0).

The text of Laetz's proposed revisions to Rule 46 is in Appendix A of this decision. Laetz did not provide estimated costs or savings for his proposal.

6.5.2. Position of the Parties

Laetz states that the purpose of Contested Proposal 4 is to incorporate into the calculation of safety factors for wooden utility structures the unplanned force imposed on a structure by warping, leaning, or other deformation. Laetz asserts that his proposal is needed because there are many wood poles in California that are visibly leaning, warped, or otherwise deformed (referred to collectively hereafter as leaning poles or unplanned lean).

Laetz argues that his proposal will reduce fire hazards from leaning poles that eventually fail. Laetz further contends that his proposal should not increase costs for electric utilities or CIPs, as they should already be taking pole lean into account in their loading calculations. Rather, there should be a net cost savings by preventing conflagrations caused by leaning poles.

No party expressed support for Laetz's proposal. The proposal is opposed by the CIP Coalition, the IOUs, the POUs, and SED.

The CIP Coalition states that Laetz's proposal would reduce the calculated strength of a pole based solely on the angle that the pole is leaning, without considering the actual vertical loads on the pole. For example, if a 45-foot, Class 4 pole is leaning 5 degrees from the vertical axis, Laetz's proposal would reduce the calculated strength of the pole by 20%. The CIP Coalition asserts that in order for the strength of the pole to be reduced by 20%, a vertical load of

approximately 1,300 pounds at the top of the leaning pole would be required.[35] The CIP Coalition declares that it is highly unlikely that an un-guyed, free-standing pole would have wires weighing over 1,000 pounds attached to the top of the pole. Consequently, Laetz's proposal lacks foundation.

The other opponents agree that Contested Proposal 4 does not reflect correct engineering principles. The IOUs also assert that the proposal would likely require early replacement or reconstruction of safe poles. The POUs add that Contested Proposal 4 is unnecessary because pole lean is already considered in pole-loading calculations. SED states that public safety would be better served if the cause of unplanned lean is investigated and corrected, instead of simply reducing the safety factor using an incorrect formula.

6.5.3. Discussion

The issue before us is whether to adopt Laetz's proposed formula for reducing the calculated strength of a utility pole for unplanned lean. There is no dispute that a pole's ability to bear vertical loads is reduced by unplanned lean.

We decline to adopt Laetz's proposed formula because, as demonstrated by the CIP Coalition, the formula does not accurately calculate the reduction in a pole's ability to bear vertical loads. On the other hand, we agree with the underlying principle of Laetz's proposal that the calculation of safety factors

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[35] The CIP Coalition explains that a Class 4 wood pole is sized so it can resist a ground line force of 21,900 foot-pounds (this value has the safety factor of 4.0 included). A 20% reduction in strength for this pole equals 4,380 foot-pounds. If the pole is 45 feet long and is set in the ground 6.5 feet so the top of the pole is 38.5 feet above ground level, a 5 degree lean would result in a 3.35-foot deflection at the top of the pole. The vertical force needed to equal 4,380 foot-pounds is 4,380/3.35 or 1,307 pounds.

should incorporate unplanned lean. The failure to do so could result in overstated safety factors and, ultimately, overloaded poles.

GO 95 provides only general guidance for calculating safety factors. For the particulars not specified in GO 95, Rule 31.1 requires electric utilities and CIPs to calculate safety factors using accepted good practices. We conclude that it is not necessary to revise GO 95 to explicitly require the calculation of safety factors to incorporate unplanned lean, as this is something that is implicitly required by Rule 31.1. We place all electric utilities and CIPs on notice that the failure to incorporate unplanned lean in the calculation of safety factors, such that the minimum required safety factors are not obtained, may be a violation of GO 95 and Pub. Util. Code § 451, depending on circumstances.

6.6. Contested Proposals 5A and 5B re: GO 95, Rule 48

6.6.1. Summary of Proposals

Rule 48 of GO 95 specifies the required strength of overhead structures and parts thereof. The current text of Rule 48, as modified previously in this decision to incorporate Consensus Proposal 13, is shown below.

> Structural members and their connection shall be designed and constructed so that the structures and parts thereof **will not fail or be seriously distorted** at any load less than their maximum working loads (developed under the current construction arrangements **with loadings as specified in Rule 43) multiplied by the safety factor specified in Rule 44**. (Emphasis added.)

The core requirement in Rule 48 is that structures "will not fail" at the loads specified in Rule 43 multiplied by the relevant safety factor in Rule 44.

Rule 43 specifies the ice, temperature, and wind conditions that must be used to determine the required strength of utility poles and other structures. For

areas of the State with an elevation of 3,000 feet or less (which Rule 43.2 calls the "Light Loading District"), Rule 43.2 specifies that a wind load of 8 pounds per square foot (psf) should be used to determine the required strength of structures with cylindrical surfaces such as utility poles. A wind load of 8 psf correlates to a wind speed of 56 miles per hour (mph).

Rule 44 specifies the safety factors for the design, construction, and maintenance of structures. Rule 44, as modified by this decision, defines "safety factors as follows:

> The safety factors specified in these rules are the minimum allowable ratios of material and/or line element strengths to the effect of design loads as specified in Rule 43.

The safety factor varies with the type of material (i.e., wood, metal, concrete, etc.) and the grade of construction (i.e., Grades A, B, or C). Rule 44 requires Grade A wood utility poles to have a safety factor of at least 4.0 at the time of installation, and to be reinforced or replaced before the safety factor falls below 2.67 due to deterioration or other reasons.

The following table shows the minimum strength that Rule 48 requires for Grade A wood poles in the Light Loading District with respect to wind load:

Rule 48 Strength Requirement for Grade A Wood Poles With Respect to Wind Load – Light Loading District			
	A **Rule 43** Wind Load	**B** **Rule 44** Safety Factor	**C = A x B** **Rule 48**
New Wood Pole	8 psf 56 mph	4.0	32 psf 112 mph
Reinforce or Replace Pole	8 psf 56 mph	2.67	21.4 psf 92 mph

The above table shows that Rule 48 requires newly installed Grade A wood poles in the Light Loading District to be designed for a wind load of 32 psf (8 psf x 4.0) which equates to a wind speed of approximately 112 mph. The above table also shows that Rule 48 requires Grade A wood poles to be reinforced or replaced before the safety factor falls below 2.67, which equates to a wind load of 21.36 psf (8 psf x 2.67) and a wind speed of approximately 92 mph.

The CIP Coalition's Contested Proposal 5A would eliminate the "multiply by" provision in Rule 48 that is highlighted above. SDG&E's Contested Proposal 5B would (1) replace the "multiply by" provision with a "divide by" provision, and (2) delete the "will not fail" provision that is highlighted above. The texts of the proposed revisions to Rule 48 are shown in Appendix A of this decision. The CIP Coalition and SDG&E do not expect their proposals will increase costs for any affected entity.

6.6.2. Position of the Parties

Contested Proposals 5A and 5B are supported by the CIP Coalition, the IOUs, and the POUs. They all prefer Contested Proposal 5B. Contested Proposal 5A is a fallback position in case the Commission does not adopt Contested Proposal 5B.

The supporters of Contested Proposals 5A and 5B claim the "will not fail" and "multiply by" provisions in Rule 48 are errors. According to the supporters, the "will not fail" provision in Rule 48 is an impossible performance standard. They further claim that the "multiply by" provision in Rule 48 is the opposite of how structures are designed. The correct practice for designing structures, the supporters contend, is to first determine the strengths of the materials that will be used to build a structure, and then divide the strengths by the safety factors to determine the maximum allowable working loads. Rule 48 does the reverse; it

multiplies the maximum working loads by the safety factors to determine the required strength of materials. The supporters represent that every technical expert at the Phase 3 workshops agreed that Rule 48 needs to be corrected.

Contested Proposal 5B would correct all the alleged errors in Rule 48 by deleting the "will not fail" provision and replacing the "multiply by" provision with a "divide by" provision. Contested Proposal 5A is less ambitious, as it would only eliminate the "multiply by" provision.

The supporters of Contested Proposal 5B aver that incorporating into Rule 48 the "divide by" method for applying safety factors would bring the rule into conformance with other rules in GO 95 that use the "divide by" method, including Rule 48.2, Rule 48.4, and the sample calculations in Appendix F of GO 95, Part 1, Typical Problems, at F-11 to F-13.

The supporters opine that the current "multiply by" provision in Rule 48, when read together with the "divide by" provisions in other parts of GO 95, could be interpreted as requiring safety factors to be applied twice. This interpretation would result in the mathematical squaring of the effective safety factor. For instance, Rule 48 requires the wind load for a Grade A wood pole in Rule 43 to be multiplied by a safety factor of 4.0 in Rule 44, while other parts of GO 95 require the strength of wood to be divided by 4.0, thereby resulting in an effective safety factor of 16 (i.e., 4 x 4). Contested Proposals 5A and 5B would prevent this error by removing the "multiply by" provision from Rule 48.

The supporters argue that Contested Proposals 5A and 5B are consistent with the Commission's goals for Phase 3 of this proceeding to revise GO 95 "to reflect modern materials and practices" and to "incorporate standards regarding wood structures and materials that (a) provide electric utilities and [CIPs] with clear guidance for reliably obtaining prescribed safety factors when using wood

products with inherent variability, and (b) can be enforced by the Commission and [SED].[36]" Contested Proposals 5A and 5B address these goals by eliminating technical errors, thereby providing clearer guidance for implementing prescribed safety factors. This will help ensure that design requirements intended to reduce fire hazards are correctly interpreted and applied.

The supporters disagree with SED's claim, summarized below, that Contested Proposals 5A and 5B would reduce wind-load requirements from 92 mph to 56 mph and thereby reduce public safety. The supporters argue that SED's claim is based on several false premises. First, SED assumes incorrectly that Rule 48 requires in-service Grade A wood poles to withstand wind speeds of 92 mph. The supporters argue that Rule 43 establishes a design standard of 8 psf/56 mph in the Light Loading District, not 92 mph.

Second, SED assumes incorrectly that the purpose of safety factors is to establish a performance standard, according to the supporters. They assert the actual purpose of safety factors in Rule 44 is to provide a margin of safety for the loads specified in Rule 43 to account for variations in the strength of materials, loads, design performance, construction deviations, and other uncertainties in order to provide reasonable assurance (but no guarantee) that structures will not fail at the loads specified in Rule 43 (e.g., 8 psf/56 mph for poles).

The supporters argue that proof of the Commission's intent that safety factors serve as a safety margin for the many uncertainties in the design and construction of structures is evident in Rule 44, which specifies different safety factors for different types of materials. Rule 44, Table 4, shows that Grade A

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[36] D.12-01-032, Ordering Paragraphs 8(i) and (ii).

wood poles must have a safety factor of 4.0 at the time of installation, but metallic poles must have a safety factor of only 1.5. The supporters claim that the higher safety factor for wood poles compared to metallic poles does not mean that Rule 44 intends that wood poles must always be 167% stronger than metallic poles. Rather, the higher safety factor for wood poles reflects the considerable variation in the strength of wood poles compared to metal poles. To provide reasonable assurance that wood poles are as strong as metallic poles, Rule 44 requires a higher safety factor for wood poles.

The supporters argue that adopting SED's interpretation of Rule 48 would have perverse results. Under SED's interpretation of Rule 48, new Grade A wood poles must always be 167% stronger than new metallic poles, which makes no sense. The correct interpretation of GO 95, according to the supporters, is that wood poles and metallic poles in the Light Loading District are designed for a wind load of 8 psf/56 mph in accordance with Rule 43, with appropriate safety factors that reflect the variability of the materials used.

Third, SED assumes incorrectly that in-service Grade A wood poles are currently designed for wind speeds of 92 mph. The CIP Coalition and the IOUs assert that they have long designed their facilities using a wind load of 8 psf/56 mph in accordance with Rule 43. They do not design their facilities to meet an incorrect standard of 92 mph that SED has read into Rule 48. Contested Proposals 5A and 5B would align Rule 48 with the reality in the field and eliminate the ability of SED to enforce an incorrect interpretation of Rule 48.

Finally, the supporters of Contested Proposals 5 A and 5B argue that SED's concern that these proposals will lower the statewide GO 95 wind-load standard from 92 mph to 56 mph is obviated by Rule 31.1 of GO 95, which requries facilites to be designd with "known local conditions" in mind. Thus, if local

winds are known to exceed 56 mph, then facilities in that area must be designed to take such winds into account pursuant to Rule 31.1.

The IOUs contend that if the Commission decides to retain the "will not fail" provision of Rule 48, the Commission must declare whether the mere failure of a facility is a violation of the rule, even if the IOU built the facility in compliance with every standard in GO 95.

Contested Proposals 5A and 5B are opposed by the LA County Fire Dept., Laetz, MGRA, and SED. These parties interpret Rule 48 as establishing a "will not fail" wind-load performance standard of 92 mph for in-service Grade A wood poles in the Light Loading District. They are concerned that Contested Proposals 5A and 5B would lower the standard to 56 mph, which is too low and thus unsafe for many parts of the State. The LA County Fire Dept. adds that lowering the standard to 56 mph in Southern California, where Santa Ana winds often exceed 70 mph, could generate disastrous results.

Laetz and MGRA argue that because Contested Proposals 5A and 5B would reduce public safety, these proposals are outside the scope of this proceeding pursuant to OIR 08-11-005, D.12-01-032, and the Phase 3 Scoping Memo, all of which held that the focus of this proceeding is to enhance fire safety.

6.6.3. Discussion

The criterion we will use to decide whether to adopt Contested Proposal 5A or 5B is whether the proposal is consistent with the primary purpose of this

proceeding of reducing the fire hazards associated with overhead power lines and aerial CIP facilities in close proximity to power lines.[37]

Rule 48 requires overhead structures to be designed and constructed so they will not fail at any loads less than the loads specified in Rule 43 multiplied by the safety factor specified in Rule 44. Contested Proposal 5A would remove the entire "multiplied by the safety factor specified in Rule 44" provision in Rule 48. We are not persuaded that the elimination of the "multiply by" provision in Rule 48 would enhance fire safety. To the contrary, eliminating this provision would likely weaken fire safety by removing the sole provision in GO 95 that requires overhead structures to be constructed so they will not fail at the wind loads specified in Rule 43 "multiplied by the safety factor specified in Rule 44." Structures would only have to be built so they will not fail at the wind loads specified in Rule 43. Utility structures built under the relaxed standard contemplated by Contested Proposal 5A would have a higher risk of failure when subjected to strong winds, and thus a higher risk of igniting a fire. For these reasons, we conclude that Contested Proposal 5A is unrelated to the purpose of this proceeding. Therefore, we decline to adopt the proposal.

Contested Proposal 5B has two main elements. First, the proposal would remove the "will not fail" provision in Rule 48. We considered and rejected an identical proposal in our Phase 2 Decision. There, we held that:

> The [IOUs] seek to delete the provision in Rule 48 that states utility structures must be designed and constructed so they "will not fail" at any load less than their maximum working

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[37] OIR 08-11-005 at 1, 5, 12 - 13, and 14; D.12-01-032, Ordering Paragraph 8, at 177-178; and the Phase 3 Scoping Memo dated June 1, 2012, at 2 – 4.

> loads specified in Rule 43 multiplied by the safety factors specified in Rule 44. The primary reason the [IOUs] seek to delete the "will not fail" provision from Rule 48 is that it purportedly establishes an impossible performance standard for the design and construction of facilities. This exposes the [IOUs] to liability if a structure fails, even though the structure was designed and constructed to meet the maximum working stresses, safety factors, and material strengths specified in Rules 43, 44, and 48.
>
> We find that the [IOUs] have not presented a reasonable justification for revising Rule 48. The primary purpose of this proceeding is to consider and adopt measures to reduce the fire hazards associated with overhead facilities. [The IOU's] proposal is unrelated to this purpose. Furthermore, the scope of this proceeding specifically excludes matters that are focused on reducing utilities' legal liability, which is apparently what the [IOU's] proposal seeks to do. Therefore, we decline to adopt the [IOU's] proposal. (D.12-01-032 at 120 – 212.)

We affirm our holding in the Phase 2 Decision that elimination of the "will not fail" provision in Rule 48 is unrelated to the purpose of this proceeding because it does not enhance fire safety, and because it focuses on reducing utilities' legal liability.[38] It is disconcerting to see the repeated efforts by the supporters of Contested Proposal 5B to use this proceeding - which was instituted for the purpose of considering and adopting measures to enhance fire safety following the catastrophic power-line fires in October 2007 - as a vehicle for eviscerating a core fire-safety provision in Rule 48.

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[38] The scope of this proceeding excludes matters that are focused on reducing utilities' legal liability. (Phase 2 Scoping Memo at 8, Phase 3 Scoping Memo at 4, and Amended Phase 3 Scoping Memo at 7.)

The second element of Contested Proposal 5B is to replace the "multiply by" provision in Rule 48 with a new provision that would require structures to "withstand the loadings as specified in Rule 43 without exceeding the material and/or line element strengths **divided by** the safety factors specified in Rule 44.[39]" (Emphasis added.) We interpret Contested Proposal 5B as seeking to establish a design standard equal to the loads specified in Rule 43, with the safety factors in Rule 44 providing a margin of safety for the loads specified in Rule 43.

The subtle but significant distinction between the current "multiply by" method in Rule 48 and the "divide by" method in Contested Proposal 5B is elucidated by the following example. Under both methods, newly installed Grade A wood poles in the Light Loading District must be designed and constructed using the wind load of 8 psf/56 mph specified in Rule 43. Both methods require newly installed Grade A wood poles to have a safety factor of 4.0, and both methods require Grade A wood poles to be reinforced or replaced before the safety factor drops below 2.67. A safety factor of 2.67 equates to a wind load of 21.4 psf (8 psf x 2.67), or 92 mph.

The distinction is that the current "multiply by" method in Rule 48 requires in-service poles to be constructed so they will not fail at wind speeds up to 92 mph. A failure at 70 mph, for example, could be deemed a violation of Rule 48, depending on circumstances. In contrast, the "divide by" method in Contested Proposal 5B would require in-service poles to withstand wind speeds up to 56 mph, with the safety factor of 2.67 providing a safety margin for the

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[39] Phase 3 Workshop Report, at B-47.

design standard of 56 mph. A failure at 70 mph would not be a violation because the design standard is 56 mph.

The previous example demonstrates that the current "multiply by" method in Rule 48 requires poles to withstand higher wind loads than the "divide by" method in Contested Proposal 5B. Utility poles built under the relaxed "divide by" method in Contested Proposal 5B would have a higher risk of failure when subjected to strong winds, and thus a higher risk of igniting fires. Such a result is contrary to the central purpose of this proceeding of enhancing fire safety.

For the preceding reasons, we decline to adopt Contested Proposal 5B. We disagree with the supporters of Contested Proposals 5A and 5B that Rule 48 contains unacceptable technical errors. Distilled to its essence, Rule 48 directs electric utilities and CIPs to build structures that have sufficient strength so they will not fail at the loads specified in Rule 43 multiplied by the safety factors in Rule 44. In our judgment, Rule 48 provides a clear and simple formula that provides technically sound guidance for designing structures that protect public safety. Our view was widely held in 1992 when Rule 48 in its current form was adopted by Resolution SU-10 in response to the consensus recommendation of "investor owned utilities, utility districts, municipalities, the California Cable Television Association, and associated labor unions.[40]" Resolution SU-10 found the adopted changes to Rule 48 were just and reasonable, and noted that the adopted changes were considered state of the art.[41] We find that the supporters

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[40] Resolution SU-10, dated January 21, 1992, at 1.

[41] Resolution SU-10, dated January 21, 1992, at unnumbered pages 2, 3, and 7.

of Contested Proposals 5A and 5B have not presented a persuasive case that Rule 48, which was just, reasonable, and state of the art in 1992, contains unacceptable technical errors today.

We disagree with the supporters of Contested Proposals 5A and 5B that the sole purpose of safety factors is to provide a safety margin for uncertainties regarding material strengths, loads, design performance, and construction deviations. Their interpretation of safety factors is contrary to the plain language of Rule 48 that structures shall be constructed so they "will not fail" at the loads specified in Rule 43 multiplied by the safety factors in Rule 44. The effect of Rule 48 is to establish safety factors as a will-not-fail performance standard.

Our conclusion that Rule 48 applies safety factors as a will-not-fail performance standard is consistent with other rules in GO 95, as modified by this decision, that allow a minimum safety factor of 1.0 in many situations,[42] including the following:

- In-service Grade A poles made of metal or other engineered materials.
- In-service Grade A crossarms made of metal or other engineered materials.
- In-service Grade B poles made of metal, prestressed concrete, post-tensioned concrete, or other engineered materials,
- In-service Grade B crossarms made of metal, prestressed concrete, or other engineered materials.
- All in-service Grade C structures and parts thereof, including all poles, crossarms, conductors, guys, etc.

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[42] See, for example, Rules 44.3, 47.4, 47.5, 49.2(C)(1)(a) and (b), 49.3(C)(1)(a), and Appendix F, Example 8, at F-7 and F-8.

In situations where GO 95 allows a safety factor of 1.0, the design strength of the structure is exactly equal to the design loads for the structure. The entire safety factor of 1.0 must be available to support the design loads; none of the safety factor of 1.0 can serve as a safety margin for uncertainties in material strengths, loads, design performance, or construction deviations because this would allow the strength of the structure to be less than the design loads, thereby placing the structure at risk of failure. The inescapable conclusion is that when GO 95 specifies a safety factor of 1.0, the safety factor is a mandatory will-not-fail performance standard.[43] The same principle applies when GO 95 specifies a safety factor greater than 1.0.[44]

We disagree with the supporters of Contested Proposals 5A and 5B that the "multiply by" provision in Rule 48, when read together with the "divide by" provisions in other parts of GO 95, could be interpreted as requiring the squaring of safety factors (e.g., when Rule 44 specifies a safety factor of 4.0, the required safety factor is 16 (i.e., 4 x 4)). There is nothing in GO 95 that explicitly requires a

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[43] For many decades, Rule 44 prescribed a minimum safety factor of 1.0 for newly installed wood poles and crossarms for construction Grade "F". Thus, even though there is variability in the strength of wood products, Rule 44 nonetheless intended a will-not-fail performance standard when using wood for construction Grade "F". Although this decision eliminates construction Grade "F", our decision does not signal that the will-not-fail performance standard is flawed.

[44] Rule 44.1 requires newly installed Grade A metal poles to have a safety factor of 1.5, and newly installed Grade C wood poles to have a safety factor of 2.0. The safety factor for both types of poles may degrade to 1.0 pursuant to Rule 44.3. Any uncertainties regarding the strengths of materials, etc., allowed in the initial safety factor for these types of poles would remain when the safety factor degrades to 1.0. The poles would be unsafe at this point because the design loads would exactly equal the "uncertain" strength of the poles. To avoid unsafe poles, safety factors must be interpreted as a will-not-fail performance standard.

squaring of safety factors, and we do not see anything in GO 95 that implicitly requires a squaring of safety factors. Our interpretation of GO 95 is apparently shared by the CIPs and electric utilities, as there is no record in this proceeding that a CIP or electric utility has ever used a squaring of safety factors to design and construct overhead facilities.

On the other hand, the supporters of Contested Proposals 5A and 5B raise the legitimate point that the "multiply by" provision in Rule 48 is outwardly inconsistent with other rules in GO 95 that contain a "divide by" provision.[45] We believe the "multiply by" and "divide by" provisions can be harmonized if they are viewed as two sides of the same coin. On one side of the coin, the required strength of a structure is determined by taking the loads specified in Rule 43 "multiplied by" the safety factors in Rule 44. On the other side of the coin, the strength of a structure is "divided by" the safety factors in Rule 44 to determine if the structure can support the loads specified in Rule 43. Either method is acceptable, as demonstrated by the current Rule 48.7 which uses both methods.[46]

We agree to a limited extent with the supporters of Contested Proposals 5A and 5B that the "multiply by" provision in Rule 48 can result in inconsistent safety factors when using different types of materials for the same application. For example, Rule 44 requires newly installed Grade A wood poles to have a safety factor of 4.0, which equates to a wind load of 32 psf/112 mph, versus a safety factor of 1.5 for newly installed metallic poles, which equates to a

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[45] The "divide by" provision appears in Rules 48.2, 48.4, and 48.7 (prior to modification by this decision).

[46] The current Rule 48.7 is deleted by this decision as part of Consensus Proposal 13 for reasons that are unrelated to the merits of the "multiply by" method.

wind load of 12 psf/68 mph.[47] However, we strongly disagree that the dilemma of inconsistent safety factors should be resolved by lowering the wind-load design standard for all types of poles to 8 psf/56 mph as advocated by the supporters of Contested Proposals 5A and 5B.

The IOUs assert that if the Commission retains the will-not-fail provision in Rule 48, the Commission must declare whether the mere failure of an IOU's facility is a violation per se of Rule 48, even if the IOU built the failed facility in compliance with every rule in GO 95. We interpret the IOUs' request as seeking an advisory opinion regarding how violations of Rule 48 will be identified and enforced. Like the courts, we have a longstanding policy against issuing advisory opinions, and we decline to do so here.[48]

Finally, the CIP Coalition and the IOUs represent that they design and construct their facilities in accordance with their interpretation of GO 95 whereby utility poles in the Light Loading District are designed for a wind load of 8 psf/56 mph, with the safety factors in Rule 44 providing a margin of safety for the design load of 8 psf/56 mph. We hereby direct all entities subject to GO 95 to henceforth design and construct their facilities in accordance with the will-not-fail performance standard established by Rule 48. This standard requires, among other things, that newly installed and reconstructed Grade A wood poles in the Light Loading District must be designed and constructed so they will not fail at wind loads of 32 psf/112 mph, which may degrade over the service life of the poles to 21.4 psf/92 mph. Each CIP and electric utility shall

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[47] Obviously, metallic poles with a safety factor of 1.5 should not be used in situations where a safety factor of 4.0 is required to withstand known local wind conditions.

[48] D.12-07-025 at 5 – 7.

implement this standard as soon as practical and with all due haste with respect to facilities that are installed or reconstructed going forward.

In Phase 3, Track 3 of this proceeding, we intend to develop, adopt, and implement statewide fire-threat maps. The function of these maps is to accurately designate geographic areas where power-line fires are more likely to ignite and spread rapidly, thereby posing an increased risk of dangerous wildfires. To function properly, these maps will have to reflect local wind conditions, vegetation fuel loads, terrain, and other factors that bear on the risk of power-line fires igniting and spreading rapidly. As set forth in our Phase 2 Decision, we intend to use these fire-threat maps for several purposes, including:

i. Revising Section IV of GO 95 to incorporate (a) a new High Fire-Threat District, (b) one or more maps of the High Fire-Threat District, and (c) fire-safety standards for the design and construction electric utility and CIP structures in the High Fire-Threat District.

ii. Assessing whether any of the new fire-safety standards developed pursuant to the previous Item i.c should apply to existing facilities in the High Fire-Threat District in light of cost-benefit considerations and Rule 12 of GO 95 and, if so, developing a plan, timeline, and cost estimate for upgrading existing facilities in the High Fire-Threat District to meet the new standards. (D.12-01-032, Ordering Paragraphs 8.iii and 8.iv.)

We will expand the scope of Phase 3, Track 3 of this proceeding to consider whether, and to what extent, existing overhead structures throughout the State that do not meet the will-not-fail standard in Rule 48 need to be reinforced or replaced based on the fire-threat map(s) that will be adopted in Track 3, local wind conditions, and public-safety considerations. The assigned Commissioner may determine the exact scope of this issue and the procedures and timeframe for addressing this issue.

6.7. Contested Proposal 5C re: GO 95, Rule 48

6.7.1. Summary of Proposal

Contested Proposal 5C expresses SED's willingness to eliminate the "multiply by" provision in Rule 48 after the following conditions are met:

1. The Commission in Phase 3, Track 3, adopts and implements high-resolution fire-threat maps for the entire State, as well as special wind-load districts based on those maps.
2. Contested Proposals 6A and 6B are withdrawn at this time.

The specific revisions to Rule 48 are shown in Appendix A of this decision. SED does not believe its proposal will increase costs for electric utilities and CIPs.

6.7.2. Position of the Parties

The purpose of Contested Proposal 5C is to signal that SED is amenable to eliminating the "multiply by" provision in Rule 48, but only after the Commission has adopted (1) fire-threat maps that incorporate historic wind data, (2) wind-load districts that are based on the fire-threat maps; and (3) wind-load design standards that are appropriate for a given wind-load district.

Although Contested Proposals 5A and 5C appear similar, SED says they have profoundly different implications. SED's Contested Proposal 5C defers any revisions to Rule 48 until new wind-load standards are in place. Conversely, the CIP Coalition's Contested Proposal 5A would immediately reduce the wind-load standard from 92 mph to 56 mph for in-service Grade A wood poles in the Light Loading District. SED contends that Rule 48 should not by modified by sacrificing safety standards as would occur under Contested Proposal 5A.

SED emphasizes that its Contested Proposal 5C should not be viewed as an admission by SED that the "multiply by" provision in Rule 48 is incorrect and should be revised. Rather, SED is seeking through Contested Proposal 5C to

replace the current statewide wind-load standard of 92 mph for in-service Grade A wood poles with a new, more granular standard that is based on the fire-threat maps that will be developed in Track 3 of this proceeding. SED anticipates that the fire-threat maps, with their embedded wind data, can be used to develop new wind-load standards that accurately reflect the wind conditions for a particular area. SED believes it is likely that some areas of the State may need to retain the existing 92 mph standard, some areas may need a higher standard, and in other areas a lower standard may be appropriate.

SED's Contested Proposal 5C is supported by the LA County Fire Dept. and MGRA. They endorse SED's cautious approach to reforming Rule 48. They agree with SED that revising Rule 48 immediately as contemplated by Contested Proposals 5A and 5B would have a detrimental effect on public safety.

Contested Proposal 5C is opposed by the CIP Coalition, the IOUs, the POUs, and Laetz. The CIP Coalition and the IOUs argue that Contested Proposal 5C would unnecessarily prolong a material error in Rule 48 (i.e., the "multiply by" provision). In the same vein, the POUs oppose Contested Proposal 5C because it does not guarantee that the "multiply by" provision in Rule 48 will be eliminated.

Laetz opposes Contested Proposal 5C because it contemplates that safety factors may be lowered in Track 3 of this proceeding.

6.7.3. Discussion

SED's Contested Proposal 5C would eliminate the "multiply by" provision in Rule 48 after several conditions are satisfied, including the condition that the Commission in Track 3 adopt and implement (1) a high resolution fire-threat map for the entire state, (2) new wind-load districts based on this map, and

(3) new wind-load standards for overhead facilities that are tailored to the wind conditions in the new wind-load districts.

We agree in principle with SED that the "multiply by" provision in Rule 48 should not be eliminated without having new wind-load standards in place that fully protect public safety. Nonetheless, we decline to adopt Contested Proposal 5C at this time because it is contingent on an exact set of events occurring in Track 3. We will not prejudge the outcomes of Track 3 or how these outcomes should affect the current "multiply by" provision in Rule 48. SED may resubmit its proposal (or a modified form of its proposal) in Track 3.

6.8. Contested Proposals 6A and 6B re: GO 95, Rule 48.1

6.8.1. Summary of Proposals

Rule 48.1 of GO 95 specifies the strength of wood that should be used to design wood structures and components. Rule 48.1 states, in part, as follows:

> Values used for moduli of rupture for wood in bending, **in conjunction with the safety factors given in Rule 44**, shall not exceed those shown in Table 5. (Emphasis added.)

Table 5 of Rule 48.1 specifies the moduli of rupture for specific types of wood. For example, Table 5 shows the modulus of rupture for western red cedar utility poles is 6,000 pounds per square inch (psi). Table 5 also includes three footnotes that identify the source of the information in Table 5, provide guidance for using the information in Table 5, and allow moduli of rupture of not more than 8,000 psi for wood utility poles that meet the specifications in American National Standards Institute (ANSI) 05.1-1992.

The Phase 3 Workshop Report contains two contested proposals to revise Rule 48.1. Contested Proposal 6A is sponsored by SDG&E, and Contested Proposal 6B is sponsored by SED. Both proposals would largely replace the

existing Table 5 and associated footnotes with references to ANSI standard ANSI O5.1 for round wood poles, ANSI O5.2 for laminated wood members, and ANSI O5.3 for solid sawn crossarms and braces. These ANSI standards are written specifically for the design and construction of utility structures and are widely used by electric utilities and CIPs.

The substantive difference between Contested Proposals 6A and 6B concerns the application of safety factors. SDG&E's Contested Proposal 6A would revise Rule 48.1 to provide that the allowable stresses for wood are to be derived by "dividing" the fiber strength specified in the relevant ANSI standard by the requisite safety factor in Rule 44 of GO 95. In contrast, SED's Contested Proposal 6B would retain the current "in conjunction with" terminology.

The texts of the proposed revisions to Rule 48.1 are shown in Appendix A of this decision. Neither proposal is expected to increase costs significantly for electric utilities and CIPs.

6.8.2. Position of the Parties

There is broad support among the parties for modernizing Rule 48.1 by (1) adding references to ANSI O5.1, ANSI O5.2, and ANSI O5.3; and (2) revising Table 5 to include examples of wood pole strength values from ANSI O5.1.

As mentioned previously, the only substantive difference between Contested Proposals 6A and 6B is how each proposal applies safety factors. Contested Proposal 6A is supported by the CIP Coalition, the IOUs, and the POUs. The proposal is opposed by SED, the LA County Fire Dept., Laetz, and

MGRA. Contested Proposal 6B is supported by SED, the LA County Fire Dept., MGRA,[49] and is opposed by the CIP Coalition, the IOUs, and the POUs.

The parties who addressed Contested Proposals 6A and 6B reprised many of the arguments that are summarized previously in this decision as part of Contested Proposals 5A – 5C. These arguments are not repeated here.

The opponents of SED's Contested Proposal 6B raise the new argument that SED's effort to retain the "in conjunction with" provision in Rule 48.1 should be rejected because this provision fails to provide usable guidance for applying safety factors. The opponents claim the "in conjunction with" provision is ambiguous, which creates the potential for erroneous application of safety factors and undermines the Commission's goal of creating clear and enforceable rules that improve safety.

SED responds that it is appropriate to retain the current "in conjunction with" provision in Rule 48.1 because GO 95 has historically used this phrase when the minimum required safety factor is above 1.0.

6.8.3. Discussion

We will adopt the unopposed elements of Contested Proposals 6A and 6B by revising Rule 48.1 to (1) incorporate references to ANSI wood-related standards ANSI O5.1 (for round wood poles), ANSI O5.2 (for laminated wood members), and ANSI O5.3 (for solid sawn crossarms and braces); and (2) revise Table 5 to list selected wood fiber strengths from ANSI 05.1. As noted by the parties, these standards are written specifically for the design and construction of utility structures and are widely used by electric utilities and CIPs. The adopted

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[49] Laetz takes a neutral position with respect to Contested Proposal 6B.

revisions to Rule 48.1 are consistent with our objective of revising GO 95 to reflect modern materials and practices, with the goal of improving fire safety.

We decline to adopt the "divide by" method for applying safety factors that is part of Contested Proposal 6A because this method is intended, in part, to establish a wind-load design standard of 56 mph for much of the State. Our reasons for rejecting the 56 mph standard are explained previously in this decision as part of our discussion on Contested Proposals 5A and 5B.

We also decline to adopt SED's recommendation in Contested Proposal 6B to retain in Rule 48.1 the current "in conjunction with" method for applying safety factors. We agree with the opponents of Contested Proposal 6B that the "in conjunction with" method does not provide sufficient guidance for applying safety factors. The goal of public safety is better served when the rules regarding the application of safety factors are clear.

In order to provide clear and consistent direction regarding the application of safety factors, we will revise Rule 48.1 to conform to the will-not-fail performance standard for safety factors in Rule 48 that was described previously in our discussion of Contested Proposals 5A and 5B. For example, Rule 48.1-A shall state as follows with respect to wood poles:

> **Poles**
> Wood poles shall be designed and constructed so that poles will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the safety factors specified in Rule 44. The required strength of natural wood poles that comply with ANSI O5.1-2008 shall be derived by using the designated fiber strength specified in ANSI 05.1-2008. Table 5 lists some of the values of fiber strength specified in ANSI 05.1-2008.

The text of Rule 48.1, as revised by this decision, is contained in Appendix B of this decision.

6.9. Contested Proposals 7A & 7B, 8A & 8B, and 9A & 9B re: GO 95, Rules 48.2, 48.4, and 48.5

6.9.1. Summary of Proposals

The purpose of Contested Proposals 7A & 7B, 8A & 8B, and 9A & 9B is to revise GO 95 to reflect modern materials and practices. These proposals are summarized below.

Contested Proposals 7A and 7B re: GO 95, Rule 48.2

Rule 48.2 of GO 95 specifies the application of safety factors with respect to structural steel. The Phase 3 Workshop Report contains two contested proposals to revise Rule 48.2. Contested Proposal 7A is sponsored by SDG&E, and Contested Proposal 7B is sponsored by SED. Both proposals would replace most of the current text in Rule 48.2 with references to two modern standards published by the American Society of Civil Engineers (ASCE) regarding the design of utility structures constructed with steel. These standards are (1) ASCE 10-97, *Design of Latticed Steel Transmission Structures*; and (2) ASCE 48-11, *Design of Steel Transmission Pole Structures*. Both standards are widely used by utilities.

SDG&E and SED anticipate that the vast majority of steel structures would be governed by one of these two standards. For the small number of steel structures that fall outside the scope of either standard, Contested Proposals 7A and 7B contain identical provisions that provide design criteria based on the *Manual of Steel Construction, Allowable Stress Design*, 9th Edition, that is published by the American Institute of Steel Construction (AISC).

The only substantive difference between Contested Proposals 7A and 7B concerns the application of safety factors. SDG&E's Contested Proposal 7A

would retain the existing provision in Rule 48.2 that specifies the use of the "divide by" method for applying safety factors. In contrast, SED's Contested Proposal 7B would replace Rule 48.2's current "divide by" method with the "in conjunction with" method that is used currently in Rule 48.1.[50]

The proposed revisions to Rule 48.2 under each contested proposal are shown in Appendix A of this decision. Neither proposal is expected to increase costs significantly for electric utilities and CIPs.

Contested Proposals 8A and 8B re: GO 95, Rule 48.4

Contested Proposals 8A and 8B are sponsored by the CIP Coalition and SED, respectively. Both proposals would add a new Rule 48.4 and renumber the existing Rules 48.4 – 48.6 accordingly.[51] Under both proposals, the new Rule 48.4 would (1) stipulate how safety factors should be applied with respect to fiber-reinforced polymer materials, and (2) state that the strength of fiber-reinforced polymer materials may be determined in accordance with Section 2.6.2 of ASCE 111-2006, *Reliability Based Design of Utility Pole Structures.*

The chief difference between the two proposals is the method for applying safety factors. Contested Proposal 8A would require the allowable working stress for fiber-reinforced polymer material to be determined by "dividing" the strength of the material by the applicable safety factors in Rule 44. In contrast, SED's Contested Proposal 8B would stipulate that the "strength of the material

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[50] This decision revises Rule 48.1 to replace the "in conjunction with" method for applying safety factors with the will-not-fail method. More details about this matter are provided in this decision's discussion of Contested Proposals 6A and 6B.

[51] The existing Rule 48.7 is eliminated entirely by this decision, consistent with Consensus Proposal 13.

shall be derived **in conjunction with** the safety factors given in Rule 44 to determine the maximum allowable working stress." (Emphasis added.)

The text of the proposed new Rule 48.4 under each of the two proposals is shown in Appendix A of this decision. Neither proposal is expected to increase costs significantly for electric utilities and CIPs.

Contested Proposals 9A and 9B re: GO 95, Rule 48.5

Contested Proposals 9A and 9B are sponsored by SDG&E and SED, respectively. Both proposals would renumber Rule 48.4 to 48.5, revise the renumbered Rule 48.5, and renumber the existing Rules 48.5 and 48.6 accordingly. The renumbered Rule 48.5 currently specifies the application of safety factors with respect to "other structural materials." Contested Proposals 9A and 9B would narrow the scope of the renumbered Rule 48.8 to encompass "other engineered materials" and make several technical refinements to the rule.

The key difference between Contested Proposals 9A and 9B is the application of safety factors. Contested Proposal 9A would continue to use the "divide by" method that is currently in the renumbered Rule 48.5. In contrast, SED's Contested Proposal 9B would stipulate that the "strength of the material used shall be derived **in conjunction with** the safety factors given in Rule 44 to determine the maximum allowable working stress." (Emphasis added.)

The text of the renumbered Rule 48.5, as revised under each of the two proposals, is shown in Appendix A of this decision. Neither proposal is expected to increase costs significantly for electric utilities and CIPs.

6.9.2. Position of the Parties

Contested Proposals 7A, 8A, and 9A are supported by the CIP Coalition, the IOUs, and the POUs. These proposals are opposed by SED, the LA County Fire Dept., Laetz, and MGRA. Contested Proposals 7B, 8B, and 9B are supported

by SED, the LA County Fire Dept., and MGRA.[52] These proposals are opposed by the CIP Coalition, the IOUs, and the POUs.

The sole area of disagreement concerns the application of safety factors. Contested Proposals 7A, 8A, and 9A would use the "divide by" method, while Contested Proposals 7B, 8B, and 9B would use the "in conjunction with" method. The parties largely repeat the arguments that are summarized previously in this decision regarding the merits of the "divide by" method versus the "in conjunction with" method.

The opponents of SED's Contested Proposals 7B and 9B raise the new argument that these proposals would replace the "divide by" method for applying safety factors that is currently in Rule 48.2 and the renumbered Rule 48.5 with the "in conjunction with" method, which the opponents contend is excessively vague. The opponents argue that because SED's proposals add ambiguity where none exists, the proposals are inconsistent with the Commission's intent that GO 95 rules for the design and construction of overhead facilities should be clear and enforceable.

6.9.3. Discussion

The issue before us is whether to (1) adopt Contested Proposals 7A, 8A, and 9A, or (2) adopt Contested Proposals 7B, 8B, and 9B, or (3) take some other action. The criterion we will use to decide this issue is which alternative best achieves our goal of improving fire safety.

We agree with the parties that the current provisions in GO 95 regarding the design and construction of structures using steel and other engineered

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[52] Laetz takes a neutral position with respect to Contested Proposals 7B, 8B, and 9B.

materials are archaic. Indeed, GO 95 is so outdated that it contains no provisions regarding the use of fiber-reinforced polymer materials.

Both slates of contested proposals contain technically sound recommendations for modernizing GO 95. Contested Proposals 7A and 7B would both update Rule 48.2 by replacing much of the existing text with references to ASCE 10-97 (for the design of latticed steel transmission structures) and ASCE 48-11 (for the design of steel transmission pole structures). As noted by the parties, these ASCE standards focus exclusively on the design and construction of overhead line structures made from steel. Both standards are widely used by electric utilities and CIPs throughout the United States. In situations where these ASCE standards do not apply, Contested Proposals 7A and 7B would apply criteria for the design of steel structures derived from a manual published by the AISC.

Contested Proposals 8A and 8B would both add a new Rule 48.4 and renumber the existing Rules 48.4 – 48.6. The new Rule 48.4 would describe how safety factors should be applied with respect to fiber reinforced polymer (FRP) material – a material that is not currently in GO 95. Both proposals would incorporate a note in the new Rule 48.4 that would allow, but not require, the strength of FRP materials to be determined in accordance with ASCE 111.

Contested Proposals 9A and 9B would narrow the scope of the renumbered Rule 48.5 so that the rule, which currently applies to "other structural materials," would be limited to "other engineered materials." The reference to "other structural materials" is overly broad, as it suggests that the rule applies to all materials not otherwise covered in other parts of GO 95. Both contested proposals also replace the term "yield strength" with the more precise terms "tensile", "compression" or "shear" strength.

We find that the elements which are common to each pair of Contested Proposals are reasonable because they update GO 95 to reflect modern materials and practices. This will provide electric utilities and CIPs with widely accepted guidance for designing and constructing structures that are safe and reliable, thereby reducing the fire-safety risks associated with overhead facilities. Therefore, consistent with our goals for this phase of the proceeding, we will adopt the elements that are common to each pair of Contested Proposals.

The only substantive difference between each pair of Contested Proposals concerns the application of safety factors. Contested Proposals 7A, 8A, and 9A use the "divide by" method for applying safety factors, while Contested Proposals 7B, 8B, and 9B use the "in conjunction with" method. We decline to adopt either method for the reasons stated previously in this decision. Instead, we will revise Rules 48.2, 48.4, and 48.5 to conform to our policy that the required strength of overhead line structures and parts thereof shall be determined in accordance with the will-not-fail performance standard in Rule 48. The adopted texts on this matter shall state as follows:

> **Rule 48.2**: Overhead line structures and subcomponents made from steel shall be designed and constructed so they will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the safety factors specified in Rule 44. The required strength of steel structures and components shall be derived using ASCE 10-97 for latticed steel structures and ASCE 48-11 for tubular steel pole structures, as applicable.
>
> **Rule 48.4**: Overhead line structures and subcomponents made with fiber-reinforced polymer material shall be designed and constructed so they will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the

> safety factors specified in Rule 44. This requirement applies to tension and bending, compression and bending, and shear.
>
> **Rule 48.5**: Overhead line structures and subcomponents made with other engineered materials shall be designed and constructed so they will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the safety factors specified in Rule 44. This requirement applies to tension, compression, and shear.

The complete texts of Rules 48.2, 48.4, and 48.5, as revised by this decision, are contained in Appendix B of this decision.

7. Fire Incident Data Collection Plan

7.1. Summary of the Plan

In Phase 3, Track 2 of this proceeding, the parties jointly developed a plan for the IOUs to collect and report data to SED regarding power-line fires, and for SED to use this data to (1) identify and assess systemic fire-safety risks associated with overhead power-line facilities, and (2) formulate measures to reduce the number of fires ignited by power lines. The Track 2 participants included SED, the IOUs, communications companies, cable providers, fire agencies, consumer groups, and a private intervener. The product of their joint effort is the Fire Incident Data Collection Plan (hereafter, Fire Data Plan or Plan) that is attached to the Phase 3 Workshop Report as Appendix C.

The IOUs estimate that their startup costs to implement the Fire Data Plan will be in the range of $40,000 to $300,000, and their ongoing annual costs will be in the range of $15,000 to $350,000. SED represents that it has funding to create and manage a database to receive, safely store, and analyze the data that the IOUs will provide to SED pursuant to the Fire Data Plan.

7.2. Position of the Parties

The following parties addressed the Fire Data Plan in the Phase 3 Workshop Report and/or their briefs on the workshop report: The CIP Coalition, the IOUs, the LA County Fire Dept., Laetz, MGRA, SED, and SDG&E. With one exception, all the parties either support the proposed Fire Data Plan or acquiesce to its adoption by the Commission.

SED describes the proposed Fire Data Plan as a blueprint for the collection, reporting, and analysis of data on virtually all power-line fires, with the goal of identifying, understanding, and mitigating systemic fire-safety issues. To SED's knowledge, there is currently no data set maintained by fire agencies, the Commission, or utilities that collects data for all fires started by overhead power-line facilities.[53] The proposed Fire Data Plan will be the first database that will allow the causes of power-line fires to be rigorously studied, identified, and quantified. This will enable the development of more effective measures to reduce the number of fires ignited by power-line facilities.

SED opposes MGRA's recommendation, summarized below, to hold a workshop in this proceeding to develop a mechanism for public access to non-confidential fire data that the IOUs report to SED under the Fire Data Plan. SED responds that any discussion on the release of information provided by the IOUs pursuant to the Fire Data Plan would be better suited for the workshops that will be held pursuant to Resolution L-436 dated February 13, 2013.

The CIP Coalition supports the Fire Data Plan, but asks that its members be notified when an IOU reports a fire incident that implicates CIP facilities in

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[53] Cal Fire accumulates reliable data for fire sizes greater than 100 acres.

some fashion. To accomplish this objective, the CIP Coalition requests that the Commission, through an ordering paragraph, direct the IOUs to work with the CIPs to establish a mutually satisfactory notification process.

All the IOUs except SDG&E are "lukewarm" about the Fire Data Plan. SDG&E strongly supports the Plan. The lukewarm IOUs acknowledge that the Plan resolves their remaining concerns. In particular, to resolve the IOUs' concern that fire incident data will at times be collected by utility personnel who are not trained to investigate fires, the Fire Data Plan includes among its "Principles" that reported data will be correct, objective, and factual to the best of the utility's knowledge and will not include speculation or attribution of fault. And to resolve the IOUs' concern about the potential costs and uncertain benefits of the Fire Data Plan, the Plan requires SED to meet with all IOUs and other stakeholders nine months after the fifth year of submitting data to review the data collected, the associated costs, and any refinements.

MGRA supports the Fire Data Plan, but requests that a workshop be held to devise a mechanism for public access to non-confidential data reported by the IOUs to SED under the Plan.

Hans Laetz, the sole opponent of the Fire Data Plan, would support the Plan with two modifications. First, Laetz wants all data reported by the IOUs to be posted on the Commission's website. Second, Laetz wants the IOUs to report the location of fires in a way that is user friendly to the public. Under the Plan, IOUs will report latitude/longitude coordinates. Laetz believes the IOUs should also report the location of fires by "political subdivision."

7.3. Discussion

The issue before us is whether to adopt SED's proposed Fire Data Plan. In deciding this matter, our principle concern is whether the Plan is likely to reduce

the number of power-line fires over time. We must also consider if the benefits of collecting, reporting, and analyzing data on power-line fires outweigh the attendant costs.

In our Phase 2 Decision, we noted that there are many power-line fires every year. PG&E alone experiences approximately 75 vegetation-related fires per year. The threat to public safety posed by a power-line fire depends largely on the wind, humidity, and vegetation conditions at the time and place of the fire. The fact that there are scores of power-line fires annually for a single IOU indicates there is a credible risk that power-line fires will eventually occur under hazardous conditions.[54]

The collection and reporting of comprehensive data on power-line fire incidents is a prerequisite for any serious program of sustained fire-safety improvement. By collecting data on even minor fires, it may be possible for electric utilities and the Commission to identify and eliminate common failure mechanisms and thereby reduce the risk of fires igniting in hazardous conditions. Any reduction in the ignition of power-line fires during hazardous conditions would have a significant positive impact on public safety. The same data may also be used to assess the effectiveness of fire-prevention measures, including those measures adopted in this proceeding, for the purpose of determining if such measures should be continued, modified, or eliminated.

SED's proposed Fire Data Plan would require the IOUs to collect specified information regarding every known fire associated with their overhead power-line facilities down to one square meter in size, and to provide this data to

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[54] D.12-01-032 at 133.

SED in an annual report. The report template is attached to the Plan. The specific information to be reported is designed to aid in identifying operational and/or environmental trends relevant to fire ignitions.

The Plan requires SED to analyze the data it receives in order to identify causal mechanisms and develop measures to prevent major power-line fires. As set forth in the Plan, SED intends to use the data provided by the IOUs to:

- Analyze data across several years and among utilities.
- Cross reference the fire data to weather data.
- Cross reference fire data to utility operations, such as the frequency of inspections and maintenance.
- Conduct a statistical analysis of the data to identify environmental and/or operational trends in the data.
- Meet with IOUs to discuss SED's statistical review of the data.
- Meet with fire agencies and CIPs on an as needed basis to gain more information.

Once an operational and/or environmental trend is identified, SED intends to perform root cause analysis, if warranted, and to formulate cost-effective measures to reduce systemic fire risks. To this end, the Fire Data Plan calls for SED to engage in one or more of the following activities:

- Conduct a cost-benefit analysis of mitigation measures in collaboration with the IOUs and CIPs.
- Meet with Cal Fire and other fire agencies.
- Initiate a Commission rulemaking to address fire-safety issues identified by SED.

We find the proposed Fire Data Plan shows significant promise for reducing risks to public safety from power-line fires over the long run. It also appears the Plan can be implemented at a relatively small cost. As noted previously, the IOUs estimate their startup costs will be in the range of $40,000 to

$300,000, and their annual costs will be in the range of $15,000 to $350,000.[55] SED has funding to receive, store, and analyze the data reported by the IOUs.

We conclude for the preceding reasons that SED's proposed Fire Data Plan is reasonable and consistent with our goals for this proceeding. Therefore, we will adopt the Plan, including the Plan's guiding Principles and report templates. A copy of the approved Plan is contained in Appendix C of this decision.

The approved Fire Data Plan does not include dates for the IOUs to begin the collection of fire-incident data or to submit annual reports to SED. We will require the IOUs to commence the collection of data no later than 120 days from the date this decision is issued (as shown on the first page of this decision) and to submit annual reports to SED by April 1st of each year starting in 2015.

We agree with the CIP Coalition that CIPs should be notified when an IOU reports a fire incident that implicates CIP facilities. Therefore, consistent with the CIP Coalition's recommendation, we will direct the IOUs to work with the CIPs to establish a mutually satisfactory notification process.

We decline to adopt MGRA's proposal to convene a workshop to determine how non-confidential data reported by the utilities to SED will be made available to the public.[56] MGRA's objective is better addressed in the workshops that will be held pursuant to Resolution L-436 where the participants

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[55] Phase 3 Workshop Report at C-4.

[56] Any non-confidential data submitted by a utility pursuant to Fire Data Plan will, by definition, be available to the public pursuant to the California Public Records Act (Cal. Gov't Code § 6250 et seq.).

will consider general rules and procedures for the disclosure of safety-related records provided by utilities.[57]

We decline to adopt Laetz's proposal to post on the Commission's website the reports submitted by the IOUs. The topic of public disclosure is better addressed through the workshops that will be held pursuant to Resolution L-436. Moreover, Laetz's proposal for a blanket requirement to post entire reports is inconsistent with one of the Plan's guiding Principles that "Confidential data submitted will be protected in accordance with California law.[58]" This Principle recognizes that fire incident data submitted by the IOUs, if it is confidential, must be afforded the same degree of protection as any other confidential information the IOUs submit to the Commission.

Finally, we decline to adopt Laetz's proposal to require the IOUs to report fire locations by "political subdivision." The purpose of the Fire Data Plan is to provide SED with data on power-line fires so that SED can analyze the data, identify fire-safety risks, and formulate measures to mitigate the risk. As long as the Plan provides information in a form that is acceptable to SED, as is the case here, we see no need to burden the IOUs with a requirement to provide additional information that SED does not need.

8. Request for Additional Review

The IOUs request that the Commission provide an opportunity in this proceeding for additional in-depth technical review of GO 95 Rules 49.3 - 49.7 (inclusive) and associated rules and appendices.

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[57] Resolution L-436, dated February 13, 2013, at 14 – 16.

[58] Phase 3 Workshop Report, Appendix C, at C-10.

SED, the only party that responded to the IOUs' request, opposes the request because no reason for the request was provided. SED states that if the IOUs desire additional changes to Rules 49.3 - 49.7, there are other procedural vehicles available to them, including petitions for rule changes.

We decline to adopt the IOUs' vague request for additional in-depth technical review of Rules 49.3 - 49.7. The parties had ample opportunity in Phase 3, Track 1, of this proceeding to propose revisions to Rules 49.3 - 49.7 to reflect modern materials and practices, with the goal of improving fire safety. It is time to move on.

9. Cost Recovery

The parties did not provide firm estimates of the costs and savings associated with the revisions to GO 95 that are adopted by this decision. In general, the parties believe that most of the adopted revisions will have a negligible financial impact. We conclude that a net increase in costs, if any, will be more than offset by the public safety benefits from the adopted revisions.

We affirm our determinations in the Phase 1 Decision and the Phase 2 Decision that cost-of-service utilities are entitled to recover the reasonable costs they incur to comply with the regulations that are adopted in this proceeding after the reasonableness of such costs has been verified by the Commission.[59]

Consistent with the Phase 1 Decision and the Phase 2 Decision, we find there is no need to establish a cost-recovery mechanism for utilities with deregulated rates. Any utility with deregulated rates or rate flexibility that places a line-item charge on its customer bills to recover costs that are incurred as

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[59] D.09-08-029 at 43 – 44, and D.12-01-032 at 152 and Conclusion of Law 21.

a result of this proceeding must not state or imply that such charge is mandated or approved by the Commission.[60]

9.1. Cost Recovery for Electric IOUs

The IOUs shall track and record their costs to implement the regulations adopted in this proceeding in the Fire Hazard Prevention Memorandum Accounts (FHPMAs) they have established pursuant to the Phase 1 Decision.[61] Each IOU may file one or more applications to recover the costs recorded in its FHPMA. The number and timing of applications will be at the discretion of each IOU.[62] We will verify and assess the reasonableness of recorded costs in application proceedings.

The IOUs shall record in their FHPMAs only those costs that are not already being recovered in rates (e.g., costs that were previously booked to an IOU's FHPMA and subsequently recovered in rates in a previous GRC proceeding). Each IOU may continue to record authorized costs in its FHPMA until the first GRC that occurs after the close of this proceeding, at which time the FHPMA shall be closed. The IOU may then use the GRC mechanism to request recovery of the costs it incurs from that point forward to comply with the regulations adopted in this rulemaking proceeding. The IOU may seek to recover the ending balance in its FHPMA, if any, by filing an application.

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[60] D.12-01-032 at 152 and Conclusion of Law 22.

[61] For the purpose of today's decision, the term "IOU" includes Southern California Gas Company to the extent it operates overhead power-line facilities that are subject to the Commission's jurisdiction.

[62] An IOU may seek to recover the costs recorded in its FHPMA in its next scheduled GRC application.

9.2. Cost Recovery for the Small LECs

Consistent with the Phase 2 Decision, the Small LECs may use their annual California High Cost Fund-A (CHCF-A) Tier 3 advice letters to request recovery of the costs recorded in their FHPMAs.[63] We will verify and assess the reasonableness of the costs recorded in each Small LEC's FHPMA as part of our review the Small LEC's annual CHCF-A advice letters.

The Small LECs may only seek to recover costs via their CHCF-A advice letters that are (1) recorded in their FHPMAs, (2) directly related to the implementation of the regulations adopted in this proceeding, and (3) not recovered elsewhere. The Small LECs shall provide work papers, documents, and/or other information requested by Commission staff to analyze and verify the claimed costs. The fact that Small LECs may request recovery of costs does not ensure recovery. The Small LECs may only recover those costs that are verified and found reasonable by staff and approved by the Commission.

Each Small LEC may continue to use the CHCF-A advice letter process until the first GRC that occurs after the close of this proceeding. At that time, the Small LEC shall close its FHPMA and thereafter use the GRC mechanism to request recovery of the costs it incurs to comply with the regulations adopted in this rulemaking proceeding. The Small LEC may seek to recover the ending balance in its FHPMA, if any, in its annual CHCF-A advice letter filing.

We note that there is no requirement for Small LECs to file GRCs. However, if a Small LEC does not file a GRC, it will eventually lose all of its

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[63] D.12-01-032 at 154 – 156.

financial support from the CHCF-A through the so-called waterfall process.[64] Under the waterfall process, a Small LEC will receive 100% of its authorized financial support from the CHCF-A for three years following the GRC. Financial support then falls to 80% of the authorized amount in the fourth year after the GRC, 60% in the fifth year, and zero percent in the sixth year.[65] Thus, the ability of a Small LEC to recover the costs recorded in its FHPMA through annual CHCF-A advice letters will decline and eventually end if it does not file a GRC.

We will require each Small LEC to close its FHPMA when its authority to seek financial support from the CHCF-A reaches zero percent. The company's authority to seek recovery of the costs recorded in its FHPMA shall expire upon the closure of its FHPMA.

We note that several Small LECs have opted out of the CHCF-A, and there is no requirement for these companies to file a GRC.[66] These companies may seek to recover the costs recorded in their FHPMA as part of their next GRC filing, if any. Their authority to seek recovery of such costs will end on January 1, 2016, at which time their FHPMAs shall be closed.

10. Implementation

The implementation of the revisions to GO 95 that are adopted by this decision may require the affected entities to develop, implement, and maintain new procedures, documentation, and databases, and to train and possibly add

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[64] D.91-09-042, 41 CPUC 2d 326, 332.

[65] Ibid.

[66] These companies are Happy Valley Telephone Company, Hornitos Telephone Company, Winterhaven Telephone Company, and Verizon West Coast (which is now owned by Frontier).

personnel. All entities subject to the rules, regulations, and ordering paragraphs adopted by this decision shall implement these directives as soon as possible. We do not adopt any deadlines except those specifically established in the rules, regulations, or ordering paragraphs themselves.

SED shall revise GO 95 to incorporate the revisions adopted by this decision and publish the amended GO 95 on the Commission's website within 60 days from the date this decision is issued (as shown on the first page of this decision). The adopted revisions include any ministerial revisions to GO 95 that may be necessary, such as revising GO 95 to list the rules modified by this decision and the decision number for today's decision.

11. California Environmental Quality Act

The California Environmental Quality Act (CEQA)[67] applies to any project that has a potential for resulting in a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment unless the project is exempt from CEQA by statute or regulation.[68] The Phase 3 Workshop Report states that each proposal addressed by this decision is exempt from CEQA pursuant to Section 15378 of the CEQA Guidelines[69] because it is not a "project" under CEQA and will not have any significant impacts on the environment. No party disagrees with this assessment.

The Commission is the lead agency under CEQA with respect to the regulations adopted by this decision. We find that all of the adopted regulations

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[67] CEQA is codified in Cal. Pub. Res. Code § 21000 et seq.

[68] 14 Cal. Code Regs., Section 15378.

[69] The CEQA guidelines are set forth in 14 Cal. Code Regs., Section 15000 et seq.

are exempt from CEQA pursuant to one or more the following statutory exemptions or categorical exemptions in the CEQA guidelines:

- The adopted regulation allows for the operation, repair, or maintenance of existing electric utility and CIP facilities, and involves negligible or no expansion of an existing authorized use. (14 Cal. Code Regs., Section 15301(b).)
- The adopted regulation allows for the restoration or rehabilitation of deteriorated or damaged structures, facilities, or mechanical equipment to meet current standards of public health and safety, and involves negligible or no expansion of an existing authorized use. (14 Cal. Code Regs., Section 15301(d).)
- The adopted regulation involves the addition of safety or health protection devices for use during construction of or in conjunction with existing structures, facilities, or mechanical equipment, or topographical features. (14 Cal. Code Regs., Section 15301(f).)
- The adopted regulation involves the replacement or reconstruction of existing utility systems and/or facilities involving negligible or no expansion of capacity. (14 Cal. Code Regs., Section 15302(c).)
- The adopted regulation involves the construction and location of limited numbers of new, small facilities or structures, including electrical and other utility extensions. (14 Cal. Code Regs., Section 15303(d).)
- The adopted regulation involves the creation of government funding mechanisms or fiscal activities that do not involve any commitment to a specific project which may result in a potentially significant physical impact on the environment. (14 Cal. Code Regs., Section 15378(b)(4).)
- The adopted regulation involves the establishment, modification, structuring, restructuring, or approval of rates or other charges for the purpose of (A) meeting operating expenses, including employee wage rates and fringe benefits, (B) purchasing or leasing supplies, equipment, or materials, (C) meeting financial reserve needs and requirements, or (D) obtaining funds for capital

projects necessary to maintain service within existing service areas. (Pub. Res. Code § 21080(b)(8).)

- The adopted regulation will not have a potentially significant impact on the environment and is therefore not a "project" as defined by Pub. Res. Code § 21065 and 14 Cal. Code Regs., Section 15378(a).
- The regulation continues provisions which were adopted in D.09-08-029 or D.12-01-032 wherein it was determined that CEQA did not apply to the adopted measures. (D.09-08-029 at 7, and D.12-01-032 at 156 - 158.)

12. Need for Hearing

In OIR 08-11-005, the Commission preliminarily determined that hearings are not needed in this proceeding. Parties were provided an opportunity by the Phase 3 Scoping Memo to request evidentiary hearings with respect to the matters that are addressed by this decision. No such requests were submitted. This decision affirms there is no need for evidentiary hearings regarding the matters addressed by this decision.

13. Comments on the Proposed Decision

The proposed decision was mailed to the parties in accordance with Pub. Util. Code § 311, and comments were allowed in accordance with Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on _____, by _____. Reply comments were filed on _____, by _____.

14. Assignment of the Proceeding

Michel P. Florio is the assigned Commissioner for this proceeding and Timothy Kenney is the assigned Administrative Law Judge.

Findings of Fact

1. The regulations adopted by this decision will improve the fire safety of overhead power-line facilities and aerial CIP facilities in close proximity to overhead power lines. Any additional costs the new regulations impose on electric utilities, CIPs, or other entities are offset by the public-safety benefits.

2. In addition to enhancing fire safety, many of the revisions to GO 95 that are adopted by this decision will (i) update GO 95 to incorporate modern materials and practices; (ii) clarify GO 95 rules and compliance requirements; (iii) streamline existing requirements; and/or (iv) remove obsolete, unnecessary, or redundant provisions in GO 95.

3. The proposed regulations that are not adopted by this decision have one or more of the following defects: (i) the proposed regulation provides less public safety relative to existing regulations; (ii) the proposed regulation is not within the scope of this proceeding; (iii) the proposed regulation is contrary to the fire-safety goals of this proceeding; (iv) there is no demonstrated need for the proposed regulation; (v) the proposed regulation is not necessary in light of existing regulations or the regulations adopted by this decision; (vi) the proposed regulation is not technically sound; and/or (vii) the costs and burdens of the proposed regulation outweigh its benefits.

4. Intrusive inspections of poles provide information that is directly relevant to assessing whether the inspected poles can support additional attachments. The failure to incorporate intrusive inspection results in loading calculations, when such information is available, increases risk to public safety.

5. Loading calculations are essential for determining if an existing pole or other structure can safely support the planned addition of facilities, or if the structure needs to be reinforced or replaced in order to safely support the

planned addition of facilities. It is imperative to public safety that accurate data and/or conservative parameters be used in loading calculations.

6. The Commission and SED use loading calculations to investigate the failures of poles and other structures. Such information can help identify the root causes of failures and devise appropriate remedies.

7. Requiring the entities responsible for performing loading calculations to retain the calculations for the life of the facility for which the calculation was performed would provide information that is relevant to investigations of structural failures and thereby improve public safety over time.

8. The CIPs and IOUs represent that their in-service overhead facilities are not designed for the "will not fail" performance standard in Rule 48.

9. The "in conjunction with" method of applying safety factors in several GO 95 rules provides vague guidance for applying safety factors.

10. The "divide by" method for applying safety factors in several GO 95 rules could be misinterpreted as a manifestation of a wind-load standard of 8 psf/56 mph for utility poles in the Light Loading District.

11. The Fire Data Plan will enhance public safety at a reasonable cost.

12. The Fire Data Plan does not include deadlines for the IOUs to (i) implement the Plan's data collection requirement, and (ii) submit annual fire-data reports to SED.

13. There were no requests for an evidentiary hearing regarding the matters addressed by this decision.

Conclusions of Law

1. This is a quasi-legislative rulemaking proceeding in which no party requested an evidentiary hearing with respect to the matters at issue in this decision and none was held. Accordingly, this decision may rely on legislative

facts obtained from written submissions in this proceeding, such as the Phase 3 Workshop Report and briefs. This decision may also draw on evidence from past proceedings, the Commission's experience and expertise in regulating utilities, Commission policies, and common sense.

2. It is in the public interest to adopt the revisions to GO 95 that are contained in Appendix B of this decision for the reasons set forth in the body of this decision, the Findings of Fact, and Conclusions of Law.

3. SED should amend GO 95 to incorporate the revisions to GO 95 adopted by this decision and publish the amended GO 95 on the Commission's website within 60 days from the date this decision is issued. The adopted revisions to GO 95 include ministerial changes, such as listing the amended rules.

4. Pub. Util. Code § 451 and GO 95, Rules 11, 31.1, 44.2, and 44.4, together require the loading calculations that are conducted pursuant to Rule 44.2 regarding the planned addition of facilities to poles or other structures to incorporate the results of instructive inspections to the extent such inspections were performed and the results are available.

5. Rule 48 of GO 95 establishes a mandatory performance standard that structures and parts thereof will not fail at the loads specified in Rule 43 multiplied by the safety factors in Rule 44. Electric utilities and CIPs must design and construct their overhead facilities to comply with the "will not fail" performance standard in Rule 48.

6. The scope of Phase 3, Track 3 of this proceeding should include the topic of whether, and to what extent, overhead facilities that do not meet the will-not-fail standard in Rule 48 need to be reinforced or replaced based on the fire-threat map(s) that will be adopted in Track 3, local wind conditions, and public-safety considerations.

7. Those GO 95 rules that are adopted or revised by this decision which use either the "in conjunction with" method or the "divide by" method for applying safety factors should be modified to reflect the "will not fail" performance standard for applying safety factors in Rule 48. This modification will provide consistency among the GO 95 rules and a high level of public safety.

8. It is in the public interest to approve the Fire Data Plan in Appendix C of this decision. The IOUs should (i) commence the collection of fire incident data no later than 120 days from the date this decision is issued, and (ii) submit annual fire-data reports to SED by April 1st of each year beginning in 2015.

9. Cost-of-service utilities are entitled to recover the reasonable costs they incur to implement the regulations that are adopted in this proceeding after the reasonableness of such costs has been verified by the Commission. The cost-of-service utilities should be authorized to seek recovery of such costs on an interim basis until such costs can be incorporated into each utility's GRC.

10. There is no need to establish a cost-recovery mechanism for those utilities and CIPs whose rates are not regulated by the Commission.

11. All entities subject to the rules, regulations, and ordering paragraphs adopted by this decision should implement these directives as soon as possible. There should be no implementation deadlines except for those specifically established in the rules, regulations, or ordering paragraphs themselves.

12. CEQA applies to any project that has a potential for resulting in either a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment unless the project is exempt from CEQA by statute or regulation.

13. The Commission is the lead agency under CEQA with respect to the regulations adopted by this decision.

14. The regulations adopted by this decision are exempt from CEQA pursuant to one or more of the statutory exemptions or categorical exemptions identified in the body of this decision.

15. There is no need for an evidentiary hearing regarding the matters addressed by this decision.

16. The following order should be effective immediately so that the adopted revisions to GO 95 and the approved Fire Data Plan may be implemented expeditiously.

O R D E R

IT IS ORDERED that:

1. General Order (GO) 95 is revised to include the new and amended rules set forth in Appendix B of this decision. The Commission's Safety and Enforcement Division shall revise GO 95 to incorporate the new and amended rules and publish the revised GO 95 on the Commission's website within 60 days from the issuance date shown on the first page of this decision. The adopted revisions to GO 95 include ministerial changes, such as listing the amended rules.

2. Any utility with deregulated rates or rate flexibility that seeks to place a line-item charge on its customer bills to recover costs that are incurred as a result of this proceeding must not state or imply that the line-item charge is mandated or approved by the Commission.

3. The electric investor-owned utilities (IOUs) and Small Local Exchange Carriers (LECs) shall use the following procedures to request the recovery of the costs they incur to implement the regulations adopted in this proceeding:

   i. The IOUs and Small LECs may only seek to recover costs that are recorded in the Fire Hazard Prevention Memorandum Accounts (FHPMAs) they have established pursuant to Decision 09-08-029. Companies shall record in their FHPMAs only those costs that are not being recovered elsewhere. For the purpose of this decision, the term "IOUs" includes Southern California Gas Company to the extent it operates overhead power-line facilities that are subject to the Commission's jurisdiction.

   ii. Each IOU may file one or more applications to request the recovery of the costs recorded in its FHPMA. The number and timing of applications will be at the discretion of the IOU. Each electric IOU may continue to use this procedure until the first general rate case (GRC) that occurs after the close of this proceeding. At that time, the IOU shall close its FHPMA and thereafter use the GRC mechanism to request recovery of the costs it incurs to comply with the regulations adopted in this proceeding. The IOU may seek to recover the ending balance in its FHPMA, if any, by filing an application.

   iii. Each Small LEC may use its annual California High Cost Fund-A (CHCF-A) Tier 3 advice letter to request the recovery of costs recorded in its FHPMA. Each Small LEC may continue to use this procedure until the first GRC that occurs after the close of this proceeding. At that time, the Small LEC shall close its FHPMA and thereafter use the GRC mechanism to request recovery of the costs it incurs to comply with the regulations adopted in this proceeding. The Small LEC may seek to recover the ending balance in its FHPMA, if any, in its annual CHCF-A advice letter.

   iv. A Small LEC shall close its FHPMA when its authority to seek financial support from the CHCF-A reaches zero percent (0.0%). The company's authority to seek recovery

of any costs remaining in its FHPMA will expire upon the closure of its FHPMA.

v. The Small LECs that have opted out of the CHCF-A may seek to recover the costs recorded in their FHPMAs in their next GRC filing, if any. Their authority to seek recovery of such costs will end on January 1, 2016, at which time their FHPMAs shall be closed.

4. Electric utilities and communications infrastructure providers shall henceforth design and construct overhead facilities subject to General Order (GO) 95 to comply with the performance standard in Rule 48 of GO 95 that such facilities will not fail or be seriously distorted at any loads less than those specified in Rule 43 of GO 95 multiplied by the safety factors specified in Rule 44.

5. The scope for Phase 3, Track 3 of this proceeding shall include the issue of whether, and to what extent, existing overhead power-line facilities and aerial communications facilities in California that do not meet the will-not-fail standard in Rule 48 General Order 95 need to be reinforced or replaced based on the fire-threat map(s) that will be adopted in Track 3, local wind conditions, and public-safety considerations. The assigned Commissioner may determine the exact scope of this issue and the procedures and timeframe for addressing this issue.

6. The Fire Incident Data Collection Plan in Appendix C of this decision is approved.

7. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall start the collection of fire-incident data in accordance with the Fire Incident Data Collection Plan that is approved by this decision no later than 120 days from the date this decision is issued.

8. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall submit annual reports in accordance with the Fire Incident Data Collection Plan that is approved by this decision by April 1st of each year beginning in 2015.

9. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company (together, "the IOUs") shall work with communication infrastructure providers (CIPs) to establish a mutually satisfactory process for notifying CIPs when an IOU reports a fire incident pursuant to the Fire Incident Data Collection Plan approved by this decision that implicates CIP facilities.

10. All electric utilities, communications infrastructure providers, and other entities subject to the rules, regulations, and ordering paragraphs adopted by this decision shall implement these directives as soon as possible. This decision does not adopt any deadlines except those specifically established in the rules, regulations, or ordering paragraphs themselves.

11. This proceeding remains open for Phase 3, Track 3.

This order is effective today.

Appendix A: Proposed Regulations

Appendix A shows the proposed revisions to General Order 95 with strikeout and underline.

Consensus Proposal 1 re: GO 95, Rule 42

Proposed Revisions to Rule 42 Shown with Strikeout and Underline

42 Grades of Construction

For all classes of lines, the relative order of grades is "A", "B", and "C" ~~and "F"~~, grade "A" being the highest. Supply and communication lines, where not involved in crossings, conflicts or on poles jointly used, shall be constructed and maintained so as to conform with grades of construction not less than as follows:

Class E supply circuit	Grade B
Class H supply circuit	Grade B
Class L supply circuit	Grade C
Class C communication circuit	Grade C ~~F~~

Supply and communication lines, where involved in crossings, conflicts or on poles jointly used, shall be constructed and maintained so as to conform with grades of construction not less than as specified in Table 3.

Note: Revised March 30, 1968 by Decision No. 73813

Table 3: Grades of Construction

Class of Circuit Involved at Upper Level	Other Facilities Involved at Lower Level at Crossings, Conflicts or on Poles Jointly Used	Grade of Construction to Be Used at Upper Level
E or H	Class C Circuits	"A"
E, H or L	Major railways (steam, electric or other motive power, at crossings only)	"A"
E, H or L	Minor railways (at crossings only)	"B"
E or H	Under all conditions not required to be Grade "A" ~~(except supply cables treated as specified in Rule 57.8)~~	"B"
~~L~~	~~Under all conditions not required to be Grade "A" or "B"~~	~~"C"~~
~~Supply cables treated as specified in Rule 57.8~~	~~Under all conditions~~	~~"C"~~
C	Class E or H Circuits	"A"
C	Major railways (at crossings only)	"B"

~~C~~	~~Class L circuits of more than 750 Volts~~	~~"C"~~
~~C~~	~~Supply cables treated as specified in Rule 57.8~~	~~"F"~~
L or C	Under all conditions not required to be Grade "A", or "B"~~, or "C"~~	~~"F"~~ "C"

~~Note: Rule 57.8 specified bonding and grounding of sheath and messenger of supply cables.~~

Consensus Proposal 2 re: GO 95, Rule 43

Proposed Revisions to Rule 43 Shown with Strikeout and Underline

43 Temperature and Loading

The following conditions of temperature and loading shall be used for the purposes of these rules in determining the strength required of ~~poles, towers, structures, and all parts thereof and in determining the strength and clearances of conductors~~ Lines (See Rule 22.1). "Loading" or "loads" as used in this Section includes vertical, transverse and longitudinal components of all loads. More stringent conditions may be used~~, if desired,~~ in the design of lines. The use of ~~modified~~ less stringent conditions or modified loading district limits may be authorized by this Commission upon application and presentation of data from United States weather records or other adequate and authenticated meteorological data which in the Commission's opinion justifies such change.

Consensus Proposal 3 re: GO 95, Rule 43.1-C

Proposed Revisions to Rule 43.1-C Shown with Strikeout and Underline

43.1 Heavy Loading

C. Temperature

~~Temperature shall be considered 0°F at the time of maximum loading. The normal temperature for computing erection conditions is 60°F. Maximum temperature shall be assumed as 130°F in computing sag under this condition~~.

Conductor temperature shall be assumed to be 0°F at the time of maximum loading. A conductor temperature of at least 130°F shall also be assumed for computing sag and its effect on structural loads due to weight span.

Consensus Proposal 4 re: GO 95, Rule 43.2-C

Proposed Revisions to Rule 43.2-C Shown with Strikeout and Underline

43.2 Light Loading

C. Temperature

~~Temperature shall be considered 25°F at the time of maximum loading. The normal temperature for computing erection conditions is 60°F. Maximum temperature shall be assumed as 130°F in computing sag under this condition~~.

Conductor temperature shall be assumed to be 25°F at the time of maximum loading. A conductor temperature of at least 130°F shall also be assumed for computing sag and its effect on structural loads due to weight span.

Consensus Proposal 5 re: GO 95, Rule 44

Proposed Revisions to Rule 44 Shown with Strikeout and Underline

44 Safety Factors

The safety factors specified in these rules are the minimum allowable ratios of material and/or line element strengths to the effect of design loads as specified in Rule 43. ~~to the maximum working stresses, except that:~~

Note: Safety factors are applied to account for factors such as uncertainties in strengths, loads, design performance, and minor construction deviations.

~~The safety factors for structural materials other than wood (towers, poles and crossarms) shall be applied as specified in Rules 48.2, 48.3–A, and 48.3–B, and~~

~~The safety factors for wood members in bending shall be applied to longitudinal tension and compression as ratios of the moduli of rupture to the maximum working stresses.~~

~~The maximum working stresses used with these safety factors shall be the maximum stresses which would be developed in the materials under the construction arrangement with temperature and loadings as specified in Rule 43.~~

Consensus Proposal 6 re: GO 95, Rule 44.1

Proposed Revisions to Rule 44.1 Shown with Strikeout and Underline

44.1 Installation and Reconstruction

Lines and elements of lines, upon installation or reconstruction, shall provide as a minimum the safety factors specified in Table 4. ~~for vertical loads and loads transverse to lines and for loads longitudinal to lines except where longitudinal loads are balanced or where there are changes in grade of construction (see Rules 47.3, 47.4 and 47.5).~~ The design shall consider ~~the structural loading and mechanical strength requirements of~~ all supply and communication facilities planned to occupy the structure. For purposes of this rule, the term "planned" applies to the facilities intended to occupy the structure that are actually known to the constructing company at the time of design.

Consensus Proposal 7 re: GO 95, Rule 44.1, Table 4

Proposed Revisions to Table 4 Shown with Strikeout and Underline

Table 4 – Minimum Safety Factors

Line Element ~~of Line~~	Grades of Construction			
	Grade "A"	Grade "B"	Grade "C"	~~Grade "F"~~
Conductors, splices and conductor fastenings (other than tie wires)	2	2	2	~~1~~
Pins	2	2	2	~~1~~
Pole line hardware	2	2	2	~~2~~
Line Insulators (mechanical)	3	2	2	~~2~~
Guy insulators (mechanical)				
Interlocking	2	2	2	~~2~~
~~Noninterlocking wood~~	~~3~~	~~3~~	~~3~~	~~-~~
Noninterlocking glass fiber	3	2 (a)	2 (b)	~~-~~
Guys, except in light loading rural districts	2	2	2	~~1.25~~
Guys in light loading rural districts	2	1.5	1.5	~~1.25~~
Messengers and span wires	2	2	2	~~2~~
Foundations against uplift	1.5	1.5	1.5	~~-~~
Foundations against depression	3	2	2	~~-~~
Poles, Towers and Structures				
Wood ~~poles~~	4	3	2	~~1~~
~~Metallic service and meter poles~~	~~-~~	~~2~~	~~2~~	~~-~~
~~Structural or tubular metallic poles, towers, structures, crossarms and members of foundations~~ Metal (including elements of foundations)	1.5 (c)	1.25 (c)	1.25 (c)	~~-~~
Reinforced concrete ~~poles~~	4	3	3	~~-~~
Prestressed or post-tensioned concrete ~~poles, structures and crossarms~~	1.8	1.5	1.5	~~-~~
Other ~~structural~~ engineered materials	1.5	1.25	1.25	~~-~~
Crossarms				
Wood	2	2	2	~~1~~
~~Steel~~ Metal	1.5 (c)	1.25 (c)	1.25 (c)	~~-~~
Prestressed concrete	1.8	1.5	1.5	~~-~~
Other ~~structural~~ engineered materials	1.5	1.25	1.25	~~-~~

Consensus Proposal 8 re: GO 95, Rule 44.2

Proposed Revisions to Rule 44.2 Shown with Strikeout and Underline

44.2 Additional Construction

Any entity planning the addition of facilities that materially increases ~~vertical, transverse or longitudinal~~ loads on a structure shall perform a loading calculation, to ensure that the addition of the facilities will not reduce the safety factors below the values specified by Rule 44.3. Such entity shall maintain these ~~pole~~ loading calculations for ten years and shall provide such information to authorized joint use pole occupants and the Commission upon request.

Consensus Proposal 9 re: GO 95, Rule 44.3

Proposed Revisions to Rule 44.3 Shown with Strikeout and Underline

44.3 Replacement

Lines or parts thereof shall be replaced or reinforced before safety factors have been reduced (due to factors such as deterioration and/or installation of additional facilities) in Grades "A" and "B" construction to less than two-thirds of the ~~construction~~ safety factors specified in Rule 44.1 and in Grade~~s~~ "C" ~~and "F"~~ construction to less than one-half of the ~~construction~~ safety factors specified in Rule 44.1. Poles in Grade "~~F~~ C" construction that only support communication lines shall also conform to the requirements of Rule 81.3-A. In no case shall the application of this rule be held to permit the use of structures or any member of any structure with a safety factor less than one.

Note: Allowed reductions specified in this rule are modified by Table 4, Footnotes.

Consensus Proposal 10 re: GO 95, Rule 45 and Rule 45.1

Proposed Revisions to Rules 45 and 45.1 Shown with Strikeout and Underline

44.1 Transverse Strength Requirements

In computing the transverse strength requirements of Lines (See Rule 22.1)~~all parts of structures and in calculating allowable stresses and allowable minimum sags for conductors~~ under the ~~temperature and loading~~ conditions specified in Rule 43, safety factors at least equal to those of ~~Table 4~~ Rule 44 shall be used. In heavy loading areas, for supporting structures carrying more than 10 wires (not including cables and supporting messengers) where the pin spacing does not exceed 15 inches, the transverse wind load shall be calculated on two–thirds of the total number of such wires with a minimum of ten. ~~In cases~~ ~~w~~ Where~~, due to~~ there is a change ~~of~~ in direction ~~in~~ of conductors and messengers, ~~an unbalanced side stress is imposed on the supporting structure~~, an additional transverse load shall be ~~assumed equal to~~ the resultant of all ~~conductor~~ tensions under the assumed loading conditions.

45.1 Special Provisions

Where it is impossible to obtain the required transverse strength except by the use of side guys or special structures and it is physically impossible to install them at the location of the transversely weak support, the strength may be supplied by side guying the ~~line~~ support at each side of, and as near as practicable to, such weak support with a distance not in excess of 800 feet between the supports so guyed; provided that the section of line between the transversely strong structures is weak in regard to transverse loads only, that is in a straight line and that the strength of the side guyed supports is calculated on the transverse loading of the entire section of line between them.

Consensus Proposal 11 re: GO 95, Rule 46

Proposed Revisions to Rule 46 Shown with Strikeout and Underline

46 Vertical Strength Requirements

In computing vertical strength requirements, the loads upon Lines (See Rule 22.1) ~~poles, towers, foundations, crossarms, pins, insulators and conductor fastenings~~ shall be their own weight plus the ~~superimposed weight~~ vertical loads which they support~~, including that of wires and cables~~ under the ~~loading~~ conditions of Rule 43, ~~plus that which may be added by~~ together with the effect of any difference in elevation of supports. ~~The resultant of vertical and transverse loadings on conductors shall be used in determining the allowable and working tensions or sags in accordance with Rule 43.~~

~~In addition to the above, a vertical load of 200 pounds at the outer pin position shall be included in computing the vertical loads on all crossarms. All members of structures shall be constructed to withstand vertical loads as specified above with safety factors at least equal to those specified in Rule 44.~~

On structures with crossarms or guard arms, the vertical loads on the structure shall include a load of 300 lbs. at one end of one of the arms.

Safety factors shall apply as specified in Rule 44.

Consensus Proposal 12 re: GO 95, Rule 47

Proposed Revisions to Rule 47 Shown with Strikeout and Underline

47 Longitudinal Strength Requirements

In computing the longitudinal strength requirements of Lines (See Rule 22.1) ~~structures, or any parts thereof~~, the ~~pull of the conductors,~~ longitudinal load shall be considered as that due to the maximum working tension ~~in them~~ under the ~~loading~~ conditions specified in Rule 43.

Safety factors shall apply as specified in Rule 44.

~~**47.1 Reduction in Stress**~~

~~Stresses in supporting structures due to longitudinal load may be reduced by increasing the conductor sags, provided the prescribed conductor clearances of Section III are maintained.~~

47.~~2~~1 Use of Guys and Braces

The longitudinal strength requirements for poles, towers and other supporting structures shall be met either by the structure alone or with the aid of guys and/or braces. Deflection shall be limited by guys and/or braces where such structures alone, although providing the strength and safety factors required, would deflect sufficiently under the prescribed loadings to reduce clearances below the required values.

~~**47.3 Unbalanced Loads**~~

~~Poles, towers or structures with longitudinal loads not normally balanced (as at dead ends or angles greater than can be treated as in Rule 45) shall be of sufficient strength, or shall be guyed or braced, to withstand the total unbalanced load with safety factors at least equal to those specified in Rule 44.~~

Consensus Proposal 13 re: GO 95, Rule 48 and Rule 48.7

Proposed Revisions to Rules 48 and 48.7 Shown with Strikeout and Underline

48 ~~Ultimate~~ Strength of Materials

Structural members and their connection shall be designed and constructed so that the structures and parts thereof will not fail or be seriously distorted at any load less than their maximum working loads (developed under the current construction arrangements with loadings as specified in Rule 43) multiplied by the safety factors in Rule 44.

Values used for the ~~ultimate~~ strength of material shall comply with the safety factors specified in Rule 44.

* * * * * * * * * * *

~~**48.7 Metallic Service and Meter Poles**~~

~~Metallic service and meter poles shall be designed and constructed so that the poles and parts thereof will not fail or be seriously distorted at any load less than the maximum working loads (see Rule 43 for loadings) multiplied by the safety factors specified in Table 4, Rule 44. The safety factors specified in Table 4, Rule 44 shall be applied as follows:~~

> ~~Tension: yield strength of the metal used shall be divided by the safety factor specified in Table 4, Rule 44 to determine the maximum allowable working stress.~~
>
> ~~Compression: The critical buckling strength of the material used, as determined by applicable formulas employing the effective slenderness ratio and yield strength, shall be divided by the safety factors specified in Table 4, Rule 44, to determine the maximum allowable working stress.~~
>
> ~~Shear: The yield strength of the material used shall be divided by the safety factors given in Table 4, Rule 44 to determine the maximum allowable working stress.~~

~~Note: Added July 26, 1966 by Decision No. 71009. Revised January 21, 1992 by Resolution SU-10.~~

Consensus Proposal 14 re: GO 95, Rule 48.6

Proposed Revisions to Rule 48.6 Shown with Strikeout and Underline

44.6 Tower or Pole Foundations and Footings

~~In calculating the resistance of foundations or footings of towers, poles and pole line structures to uplifts, the weight of concrete shall be taken as not more than 145 pounds per cubic foot and the weight of earth (calculated 30 degrees from the vertical) shall be taken as not more than 90 pounds per cubic foot.~~ The resistance of soil to ~~the depression of~~ foundation~~s~~ or footing bearing and uplift shall be calculated from the best available data ~~on the soil in question~~ or determined by test(s). ~~In lieu of calculation, the strength of foundations or footings against uplift or depression may be determined by tests under the soil conditions prevailing.~~

Foundation or footing resistance shall be designed with the safety factors applied as specified in Rule 44.

Consensus Proposal 15 re: GO 95, Rule 49.1-A

Proposed Revisions to Rule 49.1-A Shown with Strikeout and Underline

49.1 Poles, Towers and Other Structures

A. Strength ~~(See Rule 48)~~

(1) Wood poles shall be of sound timber ~~and shall meet the following:~~

~~**(a)** Temperature and loading factors as specified in Rule 43.~~

~~**(b)** Safety factors not less than those specified in Rule 44, and the modulus of rupture used in calculation of safety factors per Rule 48.1.~~

~~**(2)** Non-wood poles, towers and structures, including their foundations, shall meet the following:~~

~~**(a)** Temperature and loading factors as specified in Rule 43.~~

~~**(b)** Safety factors not less than those specified in Rule 44, and the structural values used in calculation of safety factors per Rules 48.2, 48.3 and 48.6~~.

(2)~~(3)~~ In cases where lateral ~~stresses~~ loads on a pole or structure require the use of a guy(s), the pole or structure below the point of the guy attachment shall be considered merely a strut, the guy(s) taking all lateral ~~stresses~~ loads. In such cases, the pole strength requirement shall apply at the point of guy attachment rather than at the ground line.

Consensus Proposal 16 re: GO 95, Rule 49.1-B

Proposed Revisions to Rule 49.1-B Shown with Strikeout and Underline

49.1 Poles, Towers and Other Structures

B. Dimensions

The minimum top circumference of wood poles shall be not less than the following:

	Inches
Grade "A" Heavy loading district	22
Grade "A" Light loading district	19
Grade "B" * Heavy and light loading districts	19
Grade "C" Heavy and light loading, urban districts	19
Grade "C" Circuits of 750-7,500 Volts, heavy loading, rural districts	19
Grade "C" Supply circuits of 0-750 Volts and communication circuits, heavy loading rural districts	16
Grade "C" Light loading, rural districts ~~Grade "F" Cable or more than 4 single wires or 8 conductors duplexed or paired, heavy loading districts~~	16
~~Grade "F" Cable or more than 4 single wires or 8 conductors duplexed or paired, heavy loading districts~~	~~15~~
~~Grade "F" Cable or more than 6 single wires or 12 conductors duplexed or paired, light loading districts~~	~~15~~
~~Grade "F" Not more than 4 single wires or 8 conductors duplexed or paired, heavy loading districts~~	~~12~~
~~Grade "F" Not more than 6 single wires or 12 conductors duplexed or paired, light loading districts~~	~~12~~

~~Note: Poles having a ground line circumference of less than 12 inches are not safe to climb unless supported by guys, pike poles, etc.~~

* Supply Poles in Grade "B" construction in rural, light loading districts may have a top circumference ~~less than 19 inches but~~ not less than 16 inches.

* Communication Poles in Grade "B" construction at crossings over major railroads may have top circumferences ~~less than 19 inches but~~ not less than 16 inches the following, provided such poles meet the specifications of ~~the American Standards Association, 05.2-1941, 05.4-1941 or 05.6-1941, and are butt treated if of western red cedar or are full-length pressure treated if of~~

~~Douglas fir or Southern Yellow pine:~~ ANSI O5.1-2008.

~~Number of Conductors Supported~~	~~Minimum Pole Top Circumference (inches)~~	
	~~Heavy Loading~~	~~Light Loading~~
~~10 or less~~	~~15~~	~~15~~
~~11-20~~	~~17~~	~~17~~
~~21 - 40~~	~~19~~	~~17~~
~~More than 40~~	~~19~~	~~19~~

Consensus Proposal 17 re: GO 95, Rule 49.1-C

Proposed Revisions to Current Rules Shown with Strikeout and Underline

49.1 Poles, Towers and Other Structures

C. Setting of Poles

~~The depths of pole setting given in Table 6 are applicable to wood poles set in firm soil or in solid rock. Where the soil is not firm, deeper settings or other special methods of pole setting should be used. Where unguyed poles are set subject to heavy strain, or at corners or curves, deeper settings or other special measures to prevent overturning or excessive movement of the pole at the ground line should be used. Where poles were set in firm soil, but the soil has since been excavated or subjected to minor ground erosion, the measure setting depth shall remain within 10% of the minimum values specified in Table 6, columns 2 and 3.~~

~~Metallic poles, prestressed concrete poles, or poles of other non-wood materials that are set directly in firm soil or rock shall be set at least as deep as specified in Table 6. for wood poles. Where the resultant bearing surface of these poles is not sufficient to prevent overturning or excessive movement of the pole at the ground line under maximum loading conditions, special measures such as heel and toe bracing, setting in concrete, bolting to a concrete foundation, or other special methods shall be used.~~

The depths of pole setting given in Table 6 are applicable to poles set in firm soil or in solid rock.

Where the resultant bearing surface is not sufficient to prevent overturning or excessive movement of the pole at the ground line, and/or the soil is not firm, deeper settings or other special methods shall be used.

Where poles were set in firm soil, but the soil has since been excavated or subjected to erosion, the minimum embedment shall be no less than 90% of the values specified in Table 6.

Table 6: Minimum Pole Setting Depths ~~of Wood Poles~~

Total Length of Pole (feet)	Depth in Soil (feet)	Depth in Rock (feet)
20	4	3
25	4 1/2	3

30	5	3
35	5	3 1/2
40	5 ½	3 1/2
45	6	4
50	6 1/2	4
55	7	4 1/2
60	7	4 1/2
65	7 1/2	5
70	7 1/2	5
75	8	5 1/2
80	8	6

Consensus Proposal 18 re: GO 95, Rule 49.2-A

Proposed Revisions to Rule 49.2-A Shown with Strikeout and Underline

44.2 Crossarms

A. Material (See Rule 48)

~~**(1) Wood:** Wood crossarm shall be of suitable grades of Douglas fir, Southern Yellow pine or other accepted species.~~

~~**(2) Metal:** Metal crossarms shall be of structural steel, cast steel, or malleable cast iron, properly galvanized or otherwise protected to resist corrosion, or may be of any corrosion-resisting metal or alloy.~~

~~**(3) Prestressed Concrete:** Prestressed concrete crossarms may be used provided they are designed in accordance with Rule 48.3-B.~~

~~**(4) Other Material:** Other materials may be used for crossarms provided they comply with Rule 48.4~~

Metal crossarms shall be protected by a corrosion resistant treatment or composed of material which is corrosion resistant.

Consensus Proposal 19 re: GO 95, Rule 49.2-C

Proposed Revisions to Rule 49.2-C Shown with Strikeout and Underline

49.2 Crossarms

C. Strength

Crossarms shall be securely supported by bracing, where necessary, to withstand unbalanced vertical loads and to prevent tipping of any arm sufficiently to decrease clearances below the values specified in Section III. Such bracing shall be securely attached to poles and crossarms. Supports in lieu of crossarms shall have means of resisting rotation in a vertical plane about their attachment to poles or shall be supported by braces as required for crossarms. Metal braces or attachments shall meet the requirements of Rules 48.2 and 49.8. ~~In computing the strength requirements to meet vertical loads the effect of such bracing may be considered.~~

In addition to the above, a vertical load of 300 lbs. at the outer pin position shall be included in computing the vertical loads on all crossarms.

Consensus Proposal 20 re: GO 95, Rule 49.2-E

Proposed Revisions to Rule 49.2-E Shown with Strikeout and Underline

49.2 Crossarms

E. Guard Arm

Guard arms shall: (i) be made of wood or other suitable material; (ii) ~~not less than~~ be at least 48 inches in length; and (iii) meet~~ing~~ the ~~same~~ insulating efficiency ~~as~~ of Rule 22.8. Each guard arm ~~and related pole attachments are required by Rule 46 to~~ shall withstand a vertical load of ~~200 pounds~~ 300 lbs. at either end.

Consensus Proposal 21 re: GO 95, Rule 49.4-B, Table 8

Proposed Revisions to Current Rules Shown with Strikeout and Underline

Table 8: Minimum Conductor Sizes (150–Foot Spans or Less)						
Loading Conditions and Grade of Construction	Material or Type of Conductor					
	Soft or Annealed Copper	Hard–Drawn or Medium Hard–Drawn Copper	Stranded Aluminum	Aluminum ~~Cable~~ Conductor Steel Reinforced	Copper Covered Steel, Bronze or Composites	Galvanized Iron or Galvanized Steel
	AWG	AWG	AWG	AWG	AWG	
Heavy Loading						
Grade " A"	4	6	1	4	6	¼ inch Diameter Strand
Grade "B" (a) (h)	4	6	1	6	8	9 BWG
Grade " C" (h)	4	6	1	6	8	9 BWG
Light Loading						
Grade "A"	4	6	1	4	8	¼ inch Diameter Strand (b)
Grade "B" (a) (c) (h)	6	6	1	6	8	9 BWG
Grade "C" (c) (h)	6	8	1	6	10	9 BWG
Heavy and Light Loading						
Supply Service Drops Crossing Trolley Wires	8	10	-	-	12	-
Other Supply Service Drops	10	10	-	-	12	-
Grade "~~F~~C" , Single Conductors (d)	-	(e)	-	-	(e)	14 BWG
Grade "~~F~~C" , Paired Conductors (d)	-	14(f)			17(g)	-

Consensus Proposal 22 re: GO 95, Rule 49.4-C(5)

Proposed Revisions to Rule 49.4-C(5) Shown with Strikeout and Underline

49.4 Conductors

C. Strength

(5) Sags and Tensions: ~~Conductor~~ Sags shall be such that under the loading conditions specified in Rule 43 the tension in the cable or conductors shall not be more than one–half ~~the~~ of its breaking strength. There are no strength requirements for the cable or conductor when supported by a messenger. See Rule 49.7-B for the strength requirements for messengers supporting cables or conductors. ~~of the conductor, other than communication circuits. The use of sags greater than the allowable minimum may be desirable in order to reduce working tensions.~~

Where the minimum size pins are used, the conductor tensions shall be limited to 2,000 pounds when applying the double arm, pin and conductor fastening provisions of Rules 49.2 and 49.3.

Consensus Proposal 23 re: GO 95, Rule 49.7-B

Proposed Revisions to Rule 49.7-B Shown with Strikeout and Underline

49.7 Messengers and Span Wires

B. Strength

Messengers and span wires shall be capable of withstanding, with safety factors as specified in Rule 44, the tension developed because of the load they support combined with the loading conditions specified in Rule 43. An allowance of ~~200~~ 300 ~~pounds~~ lbs. of vertical load for a ~~man~~ worker and cable chair shall be made in computing tensions in messengers and span wires which support cables except in the case of short spans which are not required to support ~~workmen~~ workers or where the ice loading specified in Rule 43.1–B would exceed the allowance for the ~~man~~ worker and cable chair.

~~Strength of~~ Guys supporting messenger loads shall ~~be such that the safety factor of such guys is not less than~~ comply with the safety factors ~~required of the messenger as specified in Rule 44. It is recommended that overhead guys shall be the same size as the suspension strand and that anchor guys shall be enough larger than the suspension strand to compensate for the angle between the plane of the horizontal load of the suspension strand and the line of the guy.~~

Consensus Proposal 24 re: GO 95, Rule 49.7-C

Proposed Revisions to Rule 49.7-C Shown with Strikeout and Underline

49.7 Messengers and Span Wires

C. Supports

Messengers supporting cables shall be attached to poles or crossarms with hardware ~~which provides~~ that complies with the safety factors ~~at least equal to those~~ specified in Rule 44, based on the weight of the ~~cable~~ messenger wire, cable, line-mounted equipment plus an allowance of ~~200~~300 lbs. ~~for the man~~ for a worker and cable chair. If in heavy loading areas the specified ice load exceeds in weight the ~~200~~ 300 lbs. allowance, such ice load shall be used in making the calculations in preference to the weight of the ~~man~~ worker and cable chair. ~~All hardware subject to injurious corrosion shall be protected by galvanizing, painting or other~~

~~suitable treatment.~~

Consensus Proposal 25 re: GO 95, Rule 49.8

Proposed Revisions to Rule 49.8 Shown with Strikeout and Underline

49.8 Hardwre

All pole line hardware shall be galvanized, otherwise protected by a corrosion–resistant ~~ing~~ treatment, or shall be composed of material which is corrosion resistant ~~ing~~.

Consensus Proposal 26 re: GO 95, Rule 54.10-E

Proposed Revisions to Rule 54.10-E Shown with Strikeout and Underline

54.10 Low Voltage Multiconductor Cable with Bare Neutral,0 - 750 Volts

E. Conductor Material and Strength

(1) Insulation: The phase conductors, and their jumper connections, excluding jumper connections at the pole, shall be covered with insulation suitable for the voltage involved **and** shall conform with the requirements of Rule 20.9-G. Jumper connections at the pole shall comply with the clearance requirements of Table 2, Case 17-D.

(2) Messenger: Where multiconductor cables are not maintained by workers using a cable chair, the additional allowance of the ~~200 pounds~~ 300 lbs. of vertical load specified in Rule 49.7–B may be reduced to ~~50 pounds~~ 75 lbs. to allow for the load imposed by workers on ladders.

Consensus Proposal 27 re: GO 95, Rule 54.10-H

Proposed Revisions to Rule 54.10-H Shown with Strikeout and Underline

54.10 Low Voltage Multiconductor Cable with Bare Neutral, 0 - 750 Volts

H. Fastenings

Hardware used in connection with messengers shall meet the strength requirement of Rule 49.7–C. Deadend attachments used on messengers shall have a strength not less than that of the messenger. Where cables are not maintained by workers using a cable chair, the additional allowance of ~~200 pounds~~ 300 lbs. vertical load~~,~~ specified in Rule 49.7–C may be reduced to ~~50 pounds~~ 75 lbs. to allow for the load imposed by workers ~~workmen~~ on ladders.

Consensus Proposal 28 re: GO 95, Rule 81.3-A

Proposed Revisions to Rule 81.3-A Shown with Strikeout and Underline

81.3 Material and Strength

A. Replacement of Wood Poles in Grade ~~F~~ C Construction

Wood poles in Grade ~~F~~ C construction shall be replaced or reinforced before the safety factor has been reduced to less than one, except that the circumference of sound solid wood within 18 inches above and below the ground line on such poles before replacement or reinforcement shall not be less than as follows:

Poles supporting 10 or less open wire conductors	9 inches
Poles supporting cable, or more than 10 open wire conductors	12 inches

Consensus Proposal 29 re: GO 95, Rule 84.5

Proposed Revisions to Rule 84.5 Shown with Strikeout and Underline

84.5 Sags

The minimum conductor sags shall be such that under the specified loading conditions, the safety factor specified in Table 4, Rule 44 shall be met. ~~See Table 25 in Appendix C for suggested minimum sags.~~

Consensus Proposal 30 re: GO 95, Rule 101.2

Proposed Revisions to Rule 101.2 Shown with Strikeout and Underline

101.2 Spliced or Stub-Reinforced Poles

~~Spliced poles, stub-reinforced poles and pole top extensions shall not be used in crossings or conflicts where Grade "A" construction is required.~~ See 49.1 A (4)

Consensus Proposal 31 re: GO 95, Rule 111.3

Proposed Revisions to Rule 111.3 Shown with Strikeout and Underline

111.3 Spliced or Stub-Reinforced Poles

~~Spliced poles, stub-reinforced poles and pole top extensions shall not be used in crossings or conflicts where Grade "A" construction is required or where Grade "B" construction is required for Class C lines crossing railroads.~~ See 49.1 A (4)

Consensus Proposal 32 re: GO 95, Appendix C and Table 25

Proposed Revisions to Current Rules Shown with Strikeout and Underline

Appendix C
Conductor Sags

(a) Basis of Sag Curves for Supply Conductors

Data are presented in Appendix C in the form of curves in Charts numbers 1 to 9 inclusive, showing conductor sags which produce tensions that do not exceed either 35% of ultimate strength of the conductor at 60°F. and no wind, or 50% of ultimate strength (safety factor of 2) of the conductor under the maximum loading conditions specified for Light or Heavy Loadings in Rule 43. These sags are considered particularly applicable to the stringing of new wire (i.e., they should be considered initial sags for conductors which have not been prestressed) and are not recommended in the case of used or so–called prestressed wire.

The curves of the sag charts were drawn from computations made under the following conditions:

1. Sag curves in the Light Loading charts are based on 35% of conductor ultimate tensions at 60°F. and no wind.
2. Sag curves in the Heavy Loading charts show sags which will obtain at 60°F. and no wind, in conductors which are so strung that under heavy loading conditions the conductor tension will be one–half of the ultimate tension.
3. The sag curves for weatherproof wire are for conductors having a triple–braid–weatherproof covering.

4. Conductor dimensions, weights and loadings were taken from the tables in Appendix B.
5. Modulus of Elasticity–lbs. per square inch

Copper	17,000000
Steel and iron, solid	29,000000
Steel, stranded	21,000000
Copper-covered steel, solid	24,000000
Copper-covered steel, stranded	23,000000

6. Coefficient of Linear Thermal Expansion – per degree F.

Copper	0.0000094
Steel and iron	0.0000065
Copper-covered steel	0.0000072

(b) Communication Conductor Sags

The safety factors of Rule 44 and the conductor sizes of Rule 49.4 are the minimum requirements applicable to communication conductors. Conductors ~~having sags not less than those specified in Table 25~~ will meet the minimum requirements of these rules for Grade "~~F~~C" construction. ~~The sag values given in Table 25 are greater than are required by the minimum requirements, but are considered to be in accordance with good practice.~~

[Sections (c), (d), (e), and (f) are unchanged]

(g) Charts of Conductor Sag Curves

The following list includes charts of sags of various sizes and kinds of copper conductors, adjustment curves for temperature changes, sag adjustment curve for supports at different elevations, and a table of sags for communication conductors in Grade "~~F~~C" construction:

Chart	Description
1	Conductor Sags, Light Loading, Bare Copper, Hard Drawn and Medium
2	Conductor Sags, Light Loading, Weatherproof Copper Hard Drawn and
3	Conductor Sags, Heavy Loading, Bare Copper, Hard Drawn
4	Conductor Sags, Heavy Loading, Bare Copper, Medium Hard Drawn
5	Conductor Sags, Heavy Loading, Weatherproof Copper, Hard Drawn
6	Conductor Sags, Heavy Loading, Weatherproof Copper, Medium Hard

7	Sag Correction for Temperature - Copper
8	Sag Correction Factor – Supports at Different Elevations
9	Catenary Curve Ordinates
~~Table 2~~	~~Stringing Sags for Communication Conductors in Grade "F" Construction~~

[Charts 1- 9: No change]

Table 25: ~~Stringing Sags, In Inches, for Communication Conductors In Grade F Construction~~ deleted MM/DD/YYYY by Decision No. YY-MM-###

~~Span Length, Feet~~	~~Light Loading~~					~~Heavy Loading *~~					
	~~Temperature, Degrees Fahrenheit~~					~~Temperature, Degrees Fahrenheit~~					
	~~100~~	~~80~~	~~60~~	~~40~~	~~20~~	~~100~~	~~80~~	~~60~~	~~40~~	~~20~~	~~0~~
~~100~~	~~7~~	~~6~~	~~4.5~~	~~4~~	~~3.5~~	~~9.5~~	~~7.5~~	~~6~~	~~5~~	~~4~~	~~3.5~~
~~120~~	~~10.5~~	~~8.5~~	~~7~~	~~5.5~~	~~5~~	~~13.5~~	~~10.5~~	~~8.5~~	~~7~~	~~5.5~~	~~4.5~~
~~140~~	~~14~~	~~11~~	~~9~~	~~7.5~~	~~6.5~~	~~18.5~~	~~14.5~~	~~11.5~~	~~9.5~~	~~7.5~~	~~6.5~~
~~160~~	~~18~~	~~15~~	~~12~~	~~10~~	~~8.5~~	~~21~~	~~18~~	~~15~~	~~12.5~~	~~10.5~~	~~9~~
~~180~~	~~22~~	~~18.5~~	~~15.5~~	~~13~~	~~11~~	~~26.5~~	~~23~~	~~19~~	~~15.5~~	~~13~~	~~11~~
~~200~~	~~27~~	~~23~~	~~19~~	~~16.5~~	~~13.5~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~220~~	~~32.5~~	~~27.5~~	~~23~~	~~20~~	~~16.5~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~240~~	~~36~~	~~31.5~~	~~27~~	~~23.5~~	~~20.5~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~260~~	~~42~~	~~37~~	~~32~~	~~27.5~~	~~24~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~280~~	~~49~~	~~42.5~~	~~37~~	~~32~~	~~27.5~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~300~~	~~56~~	~~49~~	~~42.5~~	~~36.5~~	~~32~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~

~~* In heavy loading districts, sags of the given values are inadequate for the following conductors and must be increased to meet the safety factor requirements:~~

~~Hard-drawn copper, No. 12 AWG in spans greater than 130 feet.~~
~~Galvanized iron, EBB, No. 9 BWG in spans greater than 170 feet.~~
~~Galvanized iron, EBB, No 10 BWG in spans greater than 140 feet.~~
~~Galvanized iron, EBB, No. 12 and No 14 BWG in spans of any length.~~
~~Galvanized iron BB, No. 10 BWG in spans greater than 170 feet.~~
~~Galvanized iron, BB, No. 12 BWG in spans greater than 115 feet.~~
~~Galvanized iron, BB, No. 14 BWG in spans of any length.~~

Consensus Proposal 33 re: GO 95, Appendix D

Proposed Revisions to Appendix D Shown with Strikeout and Underline

Appendix D
Typical Communication Line Construction

For a communication line carrying from approximately 6 to 20 conductors in a Light Loading area, the following specifications adequately meet all intents and requirements of this order:

Poles

Round, wood, butt–treated, 25 feet in length, minimum top circumference of 15 inches, and set to a depth of 4.5 feet in firm soil.

Crossarms

3–1/4 x 4–1/4 x 10′. Attached by means of through bolts and washers, with a 15 inches center line of pole clearance to nearest conductors. Standard 30 inches quarter braces installed on the face of the crossarm with 3/8 inch bolts and 1/2 inch drive screw at the pole.

Pins

1–¼′′ x 8′′ wood pins.

Insulators

Pin type insulators to be of design that will engage the thread of the pin for not less than two and one–half turns.

Conductors

Size and material dependent upon the class of circuit involved. ~~Sags as specified in Appendix C, Table 25~~. The average span length is 150 feet.

Guys

For guying at angles or dead ends, it is recommended that a "Lead over Height" (ratio of the horizontal distance from the face of the pole to the point of entrance of anchor rod in the ground to the vertical height above the ground of the attachment of said guy wire to the pole) of 1 be used. At angles in the line where the pull of the line exceeds 4 feet, i.e., the angle of departure exceeds 5 degrees, a guy strand having a strength of l900 lbs (1/4 inch or greater) shall be used with the necessary pole shims, hook bolts, etc. (see Appendix G, Figure 86).

Hardware

All line hardware to be galvanized or of other corrosion resisting material.

Consensus Proposal 34 re: GO 95, Rule 54.10-G

Proposed Revisions to Rule 54.10-G Shown with Strikeout and Underline

54.10 Low Voltage Multiconductor Cable with Bare Neutral, 0 - 750 Volts

G. Sags

The sags of messengers which support multiconductor cable shall be such that under the maximum loading conditions, the tensions in the messengers shall not exceed the safe working stresses specified in Rule 49.7–B. Where the multiconductor cables are not maintained by workers using a cable chair, the ~~200 pounds~~ 300 lbs. additional allowance for vertical load specified in Rule 49.7–B may be reduced to ~~50 pounds~~ 75 lbs. to allow for the load imposed by workers on ladders.

Contested Proposal 1 re: GO 95, Proposed Rule 12.1-E (CIP Coalition)

Proposed Revisions to GO 95 Shown with Underline

12.1 Construction and Reconstruction of Lines

The requirements apply to all such lines and extensions of lines constructed hereafter and shall become applicable also to such lines now existing, or any portion thereof, whenever they are reconstructed.

The reconstruction of an element of a line requires that all elements subordinate to the reconstructed element meet the requirements of these rules. For the purpose of this order reconstruction will be construed to mean that work which in any way changes the identity of the pole, tower or structure on which it is performed excepting:

[No change to subparts A-D]

E. Addition of Facilities

Facilities added to a pole that result in a change of grade of construction, provided that the addition of the facilities does not reduce the safety factor of the pole for the new grade below that specified in Rule 44.3, and, for wood poles only, either: (a) the pole is less than 15 years old; or (b) the pole loading calculations include results from intrusive pole tests that were conducted within the last five years.

Contested Proposal 1 re: GO 95, Proposed Rule 44.5 (CIP Coalition)

Proposed Revisions to GO 95 Shown with Underline

[No Current Rule]

44.5 Change of Grade

Upon the completion of intrusive inspections conducted under GO 95 and/or 165 for joint poles where there has been a change of grade of construction, pole loading calculations shall be performed consistent with Rule 44.2 unless the pole is otherwise scheduled for replacement.

Contested Proposal 2 re: GO 95, Proposed Rule 31.7 (Laetz)

Proposed Revisions to GO 95 Shown with Underline

[No Current Rule]

31.7 Hazards to Aviation

Any temporary or permanent structure, including all appurtenances, that exceeds an overall height of 100 feet above ground level or exceeds any obstruction standard contained in Title 14 of the Code of Federal Regulations part 77, should normally be marked and/or lighted in accordance with "U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular AC 70/7460-1K" or, if applicable, updated FAA regulations. Any temporary or permanent structure, including all appurtenances, that crosses any paved road, with the exception of roads where lines of the same type of construction substantially parallel the road within 20 feet of the road, and that exceed an overall height of 50 feet above the paved road, and where no other road crossing exists within 500 feet, shall also be marked as above.

A. Utilities shall file a report to the SED within 90 days of implementation of this rule an inventory of where such markings will need to be installed.

B. Utilities shall complete 20 percent of such installations within 480 days of the implementation of this rule.

C. Utilities shall complete 80 percent of such installations within 845 days of the implementation of this rule.

D. Utilities shall complete all such markings within 1210 days of the implementation of this rule.

Contested Proposal 3A re: GO 95, Revised Rule 44.2 (SED)

Proposed Revisions to GO 95 Shown with Underline and Strikeout

44.2 Additional Construction

Any entity planning the addition of facilities that ~~materially increase vertical, transverse or longitudinal~~ load~~ings~~ on a structure shall perform a loading calculation to ensure that the addition of the facilities will not reduce the safety factors below the values specified by Rule 44.3. Such pole loading calculations shall be based on existing condition and proposed configuration, information provided under Rule 44.4, conservative values of relevant parameters, industry recognized values of relevant parameters, or any combination thereof. Such entity shall maintain these pole loading calculations for ten years and shall provide such information to authorized joint use pole occupants and the Commission upon request.

Note: For the purpose of Rule 44.2, a material increase in load is an addition ~~which~~ that increases the load on a structure by more than five percent per installation, or ten percent over a 12-month span, of the electric utility's or Communication Infrastructure Provider's current load.

Contested Proposal 3B re: GO 95, Revised Rule 44.2 (Laetz)

Proposed Revisions to GO 95 Shown with Underline, Strikeout, and Bold Font

44.2 Additional Construction

Any entity planning the addition of facilities that ~~materially increase vertical, transverse or longitudinal~~ load~~ings~~ on a structure shall perform a loading calculation to ensure that the addition of the facilities will not reduce the safety factors below the values specified by Rule 44.3. Such pole loading calculations shall be based on existing condition **(as reasonably verified by field observations)** and proposed configuration, information provided under Rule 44.4, conservative values of relevant parameters, industry recognized values of relevant parameters, or any combination thereof. Such entity shall maintain these pole loading calculations for ~~ten years~~ **the life of the equipment** and shall provide such information to authorized joint use pole occupants and the Commission upon request.

Note: For the purpose of Rule 44.2, a material increase in load is an addition ~~which~~ that increases the load on a structure by more than five percent per installation, or ten percent over a 12-month span, of the electric utility's or Communication Infrastructure Provider's current load.

Contested Proposal 4 re: GO 95, Revised Rule 46 (Laetz)

Proposed Revisions to GO 95 Shown with Underline and Bold Font

44 Vertical Strength Requirements

In computing vertical strength requirements the loads upon poles, towers, foundations, crossarms, pins, insulators and conductor fastenings shall be their own weight plus the superimposed weight which they support, including that of wires and cables under the loading conditions of Rule 43 plus that which may be added by difference in elevation of supports. The resultant of vertical and transverse loadings on conductors shall be used in determining the allowable and working tensions or sags in accordance with Rule 43.

In addition to the above a vertical load of 200 pounds at the outer pin position shall be included in computing the vertical loads on all crossarms.

All members of structures shall be constructed to withstand vertical loads as specified above with safety factors at least equal to those specified in Rule 44.

The predicted safety factor for any particular wooden structure shall be reduced by a percentage equal to the product of the angle, measured in degrees, that the pole deviates from its design at the point of peak deviation, and 4.0.

Contested Proposal 5A re: GO 95, Revised Rule 48 (CIP Coalition)

Proposed Revisions to GO 95 Shown with Strikeout and Bold Font

48 ~~Ultimate~~ Strength of Materials

Structural members and their connections shall be designed and constructed so that the structures and parts thereof will not fail, or be seriously distorted, at any load less than their maximum working loads ~~(~~developed under the current construction arrangements with loadings as specified in Rule 43~~) **multiplied by the safety factors in Rule 44**~~.

Values used for the ~~**ultimate**~~ strength of material shall comply with the safety factors specified in Rule 44.

Contested Proposal 5B re: GO 95, Revised Rule 48 (SDG&E)

Proposed Revisions to GO 95 Shown with Underline, Strikeout, and Bold Font

48 ~~Ultimate~~ Strength of Materials

Structural members and their connections shall be designed and constructed ~~so that the structures and parts thereof will not fail, or be seriously distorted, at any load less than their maximum working loads (developed under the current construction arrangements with~~ **to withstand the** loadings as specified in Rule 43~~) multiplied by the safety factors in Rule 44~~ **without exceeding the material and/or line element strengths divided by the safety factors specified in Rule 44**.

~~Values used for the ultimate strength of material shall comply with the safety factors specified in Rule 44.~~

Contested Proposal 5C re: GO 95, Revised Rule 48 (SED)

Proposed Revisions to GO 95 Shown with Underline, Strikeout, and Bold Font

48 ~~Ultimate~~ Strength of Materials

Structural members and their connections shall be designed and constructed so that the structures and parts thereof will not fail, or be seriously distorted, at any load less than their maximum working loads ~~(~~developed under the current construction arrangements with loadings as specified in Rule 43~~) multiplied by the safety factors in Rule 44~~.

Values used for the ~~ultimate~~ strength of material shall comply with the safety factors specified in Rule 44.

Note: Contested Proposal 5C is contingent on all of the following conditions being satisfied:

1. The Commission adopts and implements a high resolution fire-threat map for the entire state, as well as special wind loading districts based on those maps.
2. The revisions to Rule 48 will not become effective until the special wind loading districts have been adopted and implemented into Rule 43.
3. Rule Change Proposals 6A and 6B in the Workshop Report for Phase 3, Tracks 1 and 2, are withdrawn at this time.

Contested Proposal 6A re: GO 95, Rule 48.1 (SDG&E)

Proposed Revisions to GO 95 Shown with Underline and Strikeout

48.1 Wood

A. Natural Wood (Non Laminate)

~~Values used for moduli of rupture for wood in bending, in conjunction with the safety factors given in Rule 44, shall not exceed those shown in Table 5.~~

1. Poles

Allowable stresses for natural wood poles of various species meeting the requirements of ANSI O5.1-2008 shall be derived by dividing the designated fiber strength specified in that standard by the appropriate safety factors specified in Table 4. Table 5 contains a sample of some values of fiber strength specified in the standard.

2. Sawn Wood Structural Members

Allowable stresses for sawn wood structural members, such as crossarms and braces, meeting the requirements of ANSI O5.3-2008 shall be derived by dividing the designated fiber strength in that standard by the appropriate safety factors specified in Table 4.

Multiply the given allowable stress values by 0.55 for sawn wood where the loading being considered is a long time loading (continuous load for one year or more).

B. Laminated Wood

Allowable stresses for laminated wood poles and other structural members, such as crossarms, meeting the requirements of ANSI O5.2-2006 shall be derived by dividing the designated strength specified in that standard by the appropriate safety factors specified in Table 4.

Table 5 Sample Wood Strengths

Species	~~Modulus of Rupture Bending (a)~~ Designated Fiber Strength	
	~~Sawed Rectangular Poles, Crossarms, Etc. (b)~~	~~Round Poles~~

Cedar, western red	~~4,700 lbs per square inch~~	6,000 lbs per square inch
~~Douglas fir, dense~~	~~6,300 lbs per square inch~~	~~6,800 (c) lbs per square inch~~
Douglas fir~~, not dense~~	~~5,800 lbs per square inch~~	8,000 ~~6,800 (c)~~ lbs per square inch
Fir, white or red, local	~~4,700 lbs per square inch~~	~~5~~6,600 lbs per square inch
Pine, southern ~~yellow, dense~~	~~6,300 lbs per square inch~~	8,000 ~~6,800 (c)~~ lbs per square inch
~~Pine, southern yellow, not dense~~	~~5,800 lbs per square inch~~	~~6,800 (c) lbs per square inch~~
~~Redwood, virgin~~	~~5,300 lbs per square inch~~	~~6,200 lbs per square inch~~
~~Redwood, second growth~~	~~3,900 lbs per square inch~~	~~4,600 lbs per square inch~~

~~(a) Modulus of rupture in bending is based on the values for green wood as determined by the criteria and referenced standards in the United States Department of Agriculture (USDA) Wood Handbook: Wood as an Engineering Material (Forest Service Agricultural Handbook 72). Green wood is defined as freshly sawed or undried (unseasoned) wood. For woods not specifically listed in the table, other references, such as the USDA Tropical Timbers of the World (Forest Service Agriculture Handbook 607) may be used as long as the methods of testing meet or exceed the criteria and referenced standards specified in the USDA Handbook 72.~~

~~(b) Figures given are for select structural grade of material under short time loading with the neutral plane parallel to a side. Multiply the values shown by 1.4 where the neutral plane is on the diagonal of a square. Multiply the given values by 0.55 where the loading being considered is a long time loading (continuous load for one year or more). Also, sawed rectangular poles, crossarms, etc. must be derated by a factor based on how "dense" or "not dense" the wood is, and whether the wood comes from second growth. This is known as the density rule, which uses the percentage of latewood and number of growth rings per inch of radius (rate of growth). Typical factors are about 0.925 for "dense" wood and 0.85 for "not dense" wood. However, the appropriate factor must be determined for each species of wood used taking into account the locations and the conditions in which the trees were grown.~~

~~(c) Where poles meet specifications of American National Standards Institute, Inc., 05.1–1992 for Wood poles, this value may be increased to not more than 8,000 lbs. per square inch. Such poles shall be given suitable preservative treatment.~~

Contested Proposal 6B re: GO 95, Rule 48.1 (SED)

Proposed Revisions to GO 95 Shown with Underline and Strikeout

48.1 Wood

A. Natural Wood (Non Laminate)

~~Values used for moduli of rupture for wood in bending, in conjunction with the safety factors given in Rule 44, shall not exceed those shown in Table 5.~~

1. Poles

Allowable stresses for natural wood poles of various species meeting the requirements of ANSI O5.1-2008 shall be derived in conjunction with the safety factors given in Rule 44 and the designated fiber strength in that standard. Table 5 contains a sample of some values of fiber strength specified in that standard.

2. Sawn Wood Structural Members

Allowable stresses for sawn wood structural members, such as crossarms and braces, meeting the requirements of ANSI O5.3-2008 shall be derived in conjunction with the safety factors given in Rule 44 and the designated fiber strength specified in that standard.

Multiply the given allowable stress values by 0.55 for sawn wood where the loading being considered is a long time loading (continuous load for one year or more).

B. Laminated Wood

Allowable stresses for laminated wood poles and other structural members, such as crossarms, meeting the requirements of ANSI O5.2-2006 shall be derived in conjunction with the safety factors given in Rule 44 and the designated strength specified in that standard.

Table 5 Sample Wood Strengths

Species	~~Modulus of Rupture Bending (a)~~ Designated Fiber Strength	
	~~Sawed Rectangular Poles, Crossarms, Etc. (b)~~	~~Round Poles~~

Cedar, western red	~~4,700 lbs per square inch~~	6,000 lbs per square inch
~~Douglas fir, dense~~	~~6,300 lbs per square inch~~	~~6,800 (c) lbs per square inch~~
Douglas fir~~, not dense~~	~~5,800 lbs per square inch~~	8,000 ~~6,800 (c)~~ lbs per square inch
Fir, white or red, local	~~4,700 lbs per square inch~~	~~5~~6,600 lbs per square inch
Pine, southern ~~yellow, dense~~	~~6,300 lbs per square inch~~	8,000 ~~6,800 (c)~~ lbs per square inch
~~Pine, southern yellow, not dense~~	~~5,800 lbs per square inch~~	~~6,800 (c) lbs per square inch~~
~~Redwood, virgin~~	~~5,300 lbs per square inch~~	~~6,200 lbs per square inch~~
~~Redwood, second growth~~	~~3,900 lbs per square inch~~	~~4,600 lbs per square inch~~

~~(a) Modulus of rupture in bending is based on the values for green wood as determined by the criteria and referenced standards in the United States Department of Agriculture (USDA) Wood Handbook: Wood as an Engineering Material (Forest Service Agricultural Handbook 72). Green wood is defined as freshly sawed or undried (unseasoned) wood. For woods not specifically listed in the table, other references, such as the USDA Tropical Timbers of the World (Forest Service Agriculture Handbook 607) may be used as long as the methods of testing meet or exceed the criteria and referenced standards specified in the USDA Handbook 72.~~

~~(b) Figures given are for select structural grade of material under short time loading with the neutral plane parallel to a side. Multiply the values shown by 1.4 where the neutral plane is on the diagonal of a square. Multiply the given values by 0.55 where the loading being considered is a long time loading (continuous load for one year or more). Also, sawed rectangular poles, crossarms, etc. must be derated by a factor based on how "dense" or "not dense" the wood is, and whether the wood comes from second growth. This is known as the density rule, which uses the percentage of latewood and number of growth rings per inch of radius (rate of growth). Typical factors are about 0.925 for "dense" wood and 0.85 for "not dense" wood. However, the appropriate factor must be determined for each species of wood used taking into account the locations and the conditions in which the trees were grown.~~

~~(c) Where poles meet specifications of American National Standards Institute, Inc., 05.1–1992 for Wood poles, this value may be increased to not more than 8,000 lbs. per square inch. Such poles shall be given suitable preservative treatment.~~

Contested Proposal 7A re: GO 95, Rule 48.2 (SDG&E)

Proposed Revisions to GO 95 Shown with Underline and Strikeout

48.2 Steel

~~The safety factors specified in Rule 44 shall be applied as follows to structural steel:~~

~~Tension and Bending: The yield point, 33,000 pounds per square inch, shall be divided by the safety factor to determine the maximum allowable working stress.~~

~~Compression: The maximum allowable working stress shall be calculated by the following formula:~~

$$\cancel{S_{\max} = \frac{1}{f_s}\left[YP - \left(\frac{YP - 12000}{200}\right)\frac{l}{r}\right]}$$

~~Where Smax = maximum allowable working stress, lbs per square inch~~

~~fs = safety factor specified in Rule 44~~

~~YP = yield point of the steel, 33,000 lbs. per sq. in.~~

~~l = unsupported length of member, inches~~

~~r = radius of gyration of member, inches~~

~~Shear: The ultimate tensile strength, 60,000 pounds per square inch, shall be multiplied by 2/3 and divided by the safety factor specified in Rule 44 to determine the maximum allowable working stress.~~

~~Where American Society for Testing Materials (ASTM) A36-97 steel is used, the yield point shall be taken as 36,000 pounds per square inch (36ksi) and the tensile strength shall be taken as 58ksi. If other grades of steel are used, the yield point and ultimate strength used to calculate maximum working stress shall correspond to the minimum values specified in the appropriate ASTM specification for the grade of steel used.~~

As applicable, steel members and their connections shall be designed in accordance with the following standards:

Latticed Steel Structures: ASCE 10-97, and

Tubular Steel Pole Structures: ASCE 48-11

Allowable stresses for steel members and their connections shall be derived by dividing the permitted stresses specified in the applicable standard by the appropriate safety factors specified in Rule 44.

Steel members not covered by either of these standards shall be designed using allowable stresses as defined below:

Tension: The maximum allowable tensile stress shall be calculated using the following formula:

$$F_t = \frac{1}{SF}(F_y)$$

Compression: The maximum allowable compressive stress shall be calculated using the following formula:

$$F_a = \frac{1}{SF}\left[F_y - \left(\frac{F_y - 12{,}000}{200}\right)\frac{l}{r}\right]$$

Shear: The maximum allowable shear stress shall be calculated using the following formula:

$$F_v = \frac{1}{SF}\,0.66\,(F_t)$$

Bending: The maximum allowable bending stress for a compact section shall be calculated using the following equation:

$$F_b = \frac{1}{SF}F_y$$

The maximum allowable bending stress for a non-compact section shall be determined according to the provisions of Chapter E of the AISC Manual of Steel Construction, Allowable Stress Design, 9th Edition.

Combined Stresses: The strength of members subjected to combined stresses shall be determined according to the provisions of

Chapter H of the AISC Manual of Steel Construction, Allowable Stress Design, 9th Edition.

Where,

F_a = maximum allowable axial stress, psi

F_b = maximum allowable bending stress, psi

F_t = maximum allowable tensile stress, psi

F_v = maximum allowable shear stress, psi

F_y = specified minimum yield stress, psi

F_u = specified minimum tensile stress, psi

SF = safety factor as specified in Rule 44

l = unsupported length of member, inches

r = radius of gyration of member, inches

The values used for specified minimum yield stress, Fy, and specified minimum tensile stress, Fu, shall be the values as listed in the appropriate ASTM specification. If the material specification for the steel is unknown and cannot be determined, the values for Fy and Fu and shall be assumed to be 33,000 psi and 60,000 psi, respectively. The modulus of elasticity, E, is defined to be 29,000 ksi.

Contested Proposal 7B re: GO 95, Rule 48.2 (SED)

Proposed Revisions to GO 95 Shown with Underline and Strikeout

48.2 Steel

~~The safety factors specified in Rule 44 shall be applied as follows to structural steel:~~

~~Tension and Bending: The yield point, 33,000 pounds per square inch, shall be divided by the safety factor to determine the maximum allowable working stress.~~

~~Compression: The maximum allowable working stress shall be calculated by the following formula:~~

$$\cancel{S_{\max} = \frac{1}{f_s}\left[YP - \left(\frac{YP - 12000}{200}\right)\frac{l}{r}\right]}$$

~~Where Smax = maximum allowable working stress, lbs per square inch~~

~~fs = safety factor specified in Rule 44~~

~~YP = yield point of the steel, 33,000 lbs. per sq. in.~~

~~l = unsupported length of member, inches~~

~~r = radius of gyration of member, inches~~

~~Shear: The ultimate tensile strength, 60,000 pounds per square inch, shall be multiplied by 2/3 and divided by the safety factor specified in Rule 44 to determine the maximum allowable working stress.~~

~~Where American Society for Testing Materials (ASTM) A36-97 steel is used, the yield point shall be taken as 36,000 pounds per square inch (36ksi) and the tensile strength shall be taken as 58ksi. If other grades of steel are used, the yield point and ultimate strength used to calculate maximum working stress shall correspond to the minimum values specified in the appropriate ASTM specification for the grade of steel used.~~

As applicable, steel members and their connections shall be designed in accordance with the following standards:

Latticed Steel Structures: ASCE 10-97, and

Tubular Steel Pole Structures: ASCE 48-11

Allowable stresses for steel members and their connections shall be derived in conjunction with the safety factors given in Rule 44 and the permitted stresses specified in the applicable standard.

Steel members not covered by either of these standards shall be designed using allowable stresses as defined below:

Tension: The maximum allowable tensile stress shall be calculated using the following formula:

$$F_t = \frac{1}{SF}(F_y)$$

Compression: The maximum allowable compressive stress shall be calculated using the following formula:

$$F_a = \frac{1}{SF}\left[F_y - \left(\frac{F_y - 12{,}000}{200}\right)\frac{l}{r}\right]$$

Shear: The maximum allowable shear stress shall be calculated using the following formula:

$$F_v = \frac{1}{SF}\,0.66\,(F_t)$$

Bending: The maximum allowable bending stress for a compact section shall be calculated using the following equation:

$$F_b = \frac{1}{SF}F_y$$

The maximum allowable bending stress for a non-compact section shall be determined according to the provisions of Chapter E of the AISC Manual of Steel Construction, Allowable Stress Design, 9th Edition.

Combined Stresses: The strength of members subjected to combined stresses shall be determined according to the provisions of

Chapter H of the AISC Manual of Steel Construction, Allowable Stress Design, 9th Edition.

Where,

F_a = maximum allowable axial stress, psi

F_b = maximum allowable bending stress, psi

F_t = maximum allowable tensile stress, psi

F_v = maximum allowable shear stress, psi

F_y = specified minimum yield stress, psi

F_u = specified minimum tensile stress, psi

SF = safety factor as specified in Rule 44

l = unsupported length of member, inches

r = radius of gyration of member, inches

The values used for specified minimum yield stress, Fy, and specified minimum tensile stress, Fu, shall be the values as listed in the appropriate ASTM specification. If the material specification for the steel is unknown and cannot be determined, the values for Fy and Fu and shall be assumed to be 33,000 psi and 60,000 psi, respectively. The modulus of elasticity, E, is defined to be 29,000 ksi.

Contested Proposal 8A re: GO 95, New Rule 48.4 (CIP Coalition)

Note: This Proposal Would Add an Entirely New Rule 48.4 and Renumber the Existing Rules 48.4 – 48.6 Accordingly

Proposed Revisions Shown with Underline

48.4 Fiber-Reinforced Polymer

For fiber-reinforced polymer material, the safety factor specified in Rule 44 shall be applied as follows:

Tension and Bending: The strength of the material shall be divided by the safety factor specified in Rule 44 to determine the maximum allowable working stress.

Compression and Bending: The compressive or bending strength of the material or structure shall be divided by the safety factor specified in Rule 44 to obtain the allowable working stress or load capacity. The compressive strength shall be determined by a suitable formula for the material or structure, considering the strength of the material, modulus of elasticity, geometry, slenderness ratio and eccentricity of connection.

Shear: The shear strength of the material shall be divided by the safety factor specified in Rule 44 to determine the maximum allowable working stress.

Note: The strength may be determined per Section 2.6.2 of ASCE 111-2006.

Contested Proposal 8B re: GO 95, New Rule 48.4 (SED)

Note: This Proposal Would Add an Entirely New Rule 48.4 and Renumber the Existing Rules 48.4 – 48.6 Accordingly

Proposed Revisions Shown with Underline

48.4 Fiber-Reinforced Polymer

For fiber-reinforced polymer material, the safety factor specified in Rule 44 shall be applied as follows:

Tension and Bending: The strength of the material shall be derived in conjunction with the safety factors given in Rule 44 to determine the maximum allowable working stresses.

Compression and Bending: The compressive or bending strength of the material shall be derived in conjunction with the safety factors given in Rule 44 to determine the maximum allowable working stresses. The compressive strength shall be determined by suitable formula for the material or structure, considering the strength of the material, modulus of elasticity, geometry, slenderness ratio and eccentricity of connection.

Shear: The shear strength of the material shall be derived in conjunction with the safety factors given in Rule 44 to determine the maximum allowable working stresses.

Note: The strength may be determined per Section 2.6.2 of ASCE 111-2006.

Contested Proposal 9A re: GO 95, Renumbered Rule 48.5 (SDG&E)

Note: This Proposal Would Revise the Current Rule 48.4, Renumber the Revised Rule to Rule 48.5, and Renumber the Existing Rules 48.5 – 48.6 Accordingly

Proposed Revisions Shown with Strikeout and Underline

48.~~4~~5 Other ~~Structural~~ Engineered Materials

For other ~~structural~~ engineered materials, the safety factor specified in Rule 44 shall be applied as follows:

Tension: The ~~yield~~ tensile strength of the material ~~used~~ shall be divided by the safety factor specified in Rule 44 to determine the maximum allowable working stress. If the material has a published yield strength value, that value shall be used in lieu of the tensile strength value.

Compression: The ~~ultimate~~ compressive strength of the material used shall be divided by the safety factor specified in Rule 44 to obtain the allowable working stress. The ~~ultimate~~ compressive strength shall be determined by suitable formula for the material used and member geometry, considering yield and/or tensile strength of the material, modulus of elasticity, slenderness ratio and eccentricity of connection. In no case shall the ~~ultimate~~ compressive stress be greater than the yield strength of the material

Shear: The ~~ultimate~~ shear strength of the material used shall be divided by the safety factor specified in Rule 44 to determine the maximum allowable working stress.

Note: The strength may be determined per Section 2.6.2 of ASCE 111-2006.

Contested Proposal 9B re: GO 95, Renumbered Rule 48.5 (SDG&E)

Note: This Proposal Would Revise the Current Rule 48.4, Renumber the Revised Rule to Rule 48.5, and Renumber the Existing Rules 48.5 – 48.6 Accordingly

Proposed Revisions Shown with Strikeout and Underline

48.~~4~~5 Other ~~Structural~~ Engineered Materials

~~For other structural materials, the safety factor specified in Rule 44 shall be applied as follows:~~

Tension: The ~~yield~~ tensile strength of the material used shall be ~~divided by~~ derived in conjunction with the safety factors given ~~specified~~ in Rule 44 to determine the maximum allowable working stress. If the material has a published yield strength value, that value shall be used in lieu of the tensile strength value.

Compression: The ~~ultimate~~ compressive strength of the material used shall be ~~divided by~~ derived in conjunction with the safety factors ~~specified~~ given in Rule 44 to obtain the maximum allowable working stress. The ~~ultimate~~ compressive strength shall be determined by suitable formula for the material used and member geometry, considering yield and/or tensile strength of the material, modulus of elasticity, slenderness ratio and eccentricity of connection. In no case shall the ~~ultimate~~ compressive stress be greater than the yield strength of the material.

Shear: The ~~ultimate~~ shear strength of the material used shall be ~~divided by~~ derived in conjunction with the safety factors ~~specified~~ given in Rule 44 to determine the maximum allowable working stress.

Note: The strength may be determined per Section 2.6.2 of ASCE 111-2006.

(END OF APPENDIX A)

Appendix B: Adopted Revisions to General Order 95

Appendix B shows the revised General Order 95 Rules adopted by this decision.

General Order 95, Rule 42

Adopted Rule in Final Form

42 Grades of Construction

For all classes of lines, the relative order of grades is "A", "B", and "C, grade "A" being the highest. Supply and communication lines, where not involved in crossings, conflicts or on poles jointly used, shall be constructed and maintained so as to conform with grades of construction not less than as follows:

Class E supply circuit	Grade B
Class H supply circuit	Grade B
Class L supply circuit	Grade C
Class C communication circuit	Grade C

Supply and communication lines, where involved in crossings, conflicts or on poles jointly used, shall be constructed and maintained so as to conform with grades of construction not less than as specified in Table 3.

Note: Revised March 30, 1968 by Decision No. 73813

Table 3: Grades of Construction

Class of Circuit Involved at Upper Level	Other Facilities Involved at Lower Level at Crossings, Conflicts or on Poles Jointly Used	Grade of Construction to Be Used at Upper Level
E or H	Class C Circuits	"A"
E, H or L	Major railways (steam, electric or other motive power, at crossings only)	"A"
E, H or L	Minor railways (at crossings only)	"B"
E or H	Under all conditions not required to be Grade "A	"B"
C	Class E or H Circuits	"A"
C	Major railways (at crossings only)	"B"
L or C	Under all conditions not required to be Grade "A", or "B"	"C"

General Order 95, Rule 43

Adopted Rule in Final Form

43 Temperature and Loading

The following conditions of temperature and loading shall be used for the purposes of these rules in determining the strength required of Lines. (See Rule 22.1). "Loading" or "loads" as used in this Section includes vertical, transverse and longitudinal components of all loads. More stringent conditions may be used-in the design of lines. The use of less stringent conditions or modified loading district limits may be authorized by this Commission upon application and presentation of data from United States weather records or other adequate and authenticated meteorological data which in the Commission's opinion justifies such change.

General Order 95, Rule 43.1-C

Adopted Rule in Final Form

43.1 Heavy Loading

C. Temperature

Conductor temperature shall be assumed to be 0°F at the time of maximum loading. A conductor temperature of at least 130°F shall also be assumed for computing sag and its effect on structural loads due to weight span.

General Order 95, Rule 43.2-C

Adopted Rule in Final Form

43.1 Light Loading

C. Temperature

Conductor temperature shall be assumed to be 25°F at the time of maximum loading. A conductor temperature of at least 130°F shall also be assumed for computing sag and its effect on structural loads due to weight span.

General Order 95, Rule 44

Adopted Rule in Final Form

44 Safety Factors

The safety factors specified in these rules are the minimum allowable ratios of material and/or line element strengths to the effect of design loads as specified in Rule 43.

General Order 95, Rule 44.1

Adopted Rule in Final Form

44.1 Installation and Reconstruction

Lines and elements of lines, upon installation or reconstruction, shall provide as a minimum the safety factors specified in Table 4. The design shall consider all supply and communication facilities planned to occupy the structure. For purposes of this rule, the term "planned" applies to the facilities intended to occupy the structure that are actually known to the constructing company at the time of design.

The entity responsible for performing the loading calculation(s) for an installation or reconstruction shall maintain records of these calculations for the service life of the life of the pole or other structure for which the a loading calculation was made and shall provide such information to authorized joint-use occupants and the Commission upon request.

General Order 95, Rule 44.1, Table 4

Adopted Rule in Final Form

Table 4 – Minimum Safety Factors

Line Element	Grades of Construction		
	Grade "A"	Grade "B"	Grade "C"
Conductors, splices and conductor fastenings (other than tie wires)	2	2	2
Pins	2	2	2
Pole line hardware	2	2	2
Line Insulators (mechanical)	3	2	2
Guy insulators (mechanical)			
Interlocking	2	2	2
Noninterlocking glass fiber	3	2 (a)	2 (b)
Guys	2	2	2
Messengers and span wires	2	2	2
Foundations against uplift	1.5	1.5	1.5
Foundations against depression	3	2	2
Poles Towers and Structures			
Wood	4	3	2
Metal (including elements of foundations)	1.5 (c)	1.25 (c)	1.25 (c)
Reinforced concrete	4	3	3
Prestressed or post-tensioned concrete	1.8	1.5	1.5
Other engineered materials	1.5	1.25	1.25
Crossarms			
Wood	2	2	2
Metal	1.5(c)	1.25(c)	1.25(c)
Prestressed concrete	1.8	1.5	1.5
Other engineered materials	1.5	1.25	1.25

General Order 95, Rule 44.2

Adopted Rule in Final Form

44.2 Additional Construction

Any entity planning the addition of facilities that materially increases loads on a structure shall perform a loading calculation to ensure that the addition of the facilities will not reduce the safety factors below the values specified by Rule 44.3. Such loading calculations shall be based on existing condition and proposed configuration, information provided under Rule 44.4, conservative values of relevant parameters, industry recognized values of relevant parameters, or any combination thereof. The loading calculation shall also incorporate the most recent intrusive inspection data, if it exists and is available. Such entity shall maintain these loading calculations for the service life of the pole or other structure for which a loading calculation was made and shall provide such information to authorized joint-use occupants and the Commission upon request.

Note: For the purpose of Rule 44.2, a material increase in load is an addition that increases the load on a structure by more than five percent per installation, or ten percent over a 12-month span, of the electric utility's or Communication Infrastructure Provider's current load.

General Order 95, Rule 44.3

Adopted Rule in Final Form

44.3 Replacement

Lines or parts thereof shall be replaced or reinforced before safety factors have been reduced (due to factors such as deterioration and/or installation of additional facilities) in Grades "A" and "B" construction to less than two-thirds of the safety factors specified in Rule 44.1 and in Grade "C" construction to less than one-half of the safety factors specified in Rule 44.1. Poles in Grade "C" construction that only support communication lines shall also conform to the requirements of Rule 81.3-A. In no case shall the application of this rule be held to permit the use of structures or any member of any structure with a safety factor less than one.

Note: Allowed reductions specified in this rule are modified by Table 4, Footnotes.

General Order 95, Rule 45 and Rule 45.1

Adopted Rule in Final Form

45 Transverse Strength Requirements

In computing the transverse strength requirements of Lines (See Rule 22.1) under the conditions specified in Rule 43, safety factors at least equal to those of Rule 44 shall be used. In heavy loading areas, for supporting structures carrying more than 10 wires (not including cables and supporting messengers) where the pin spacing does not exceed 15 inches, the transverse wind load shall be calculated on two–thirds of the total number of such wires with a minimum of ten. Where there is a change in direction of conductors and messengers, an additional transverse load shall be the resultant of all tensions under the assumed loading conditions.

45.1 Special Provisions

Where it is impossible to obtain the required transverse strength except by the use of side guys or special structures and it is physically impossible to install them at the location of the transversely weak support, the strength may be supplied by side guying the support at each side of, and as near as practicable to, such weak support with a distance not in excess of 800 feet between the supports so guyed; provided that the section of line between the transversely strong structures is weak in regard to transverse loads only, that is in a straight line and that the strength of the side guyed supports is calculated on the transverse loading of the entire section of line between them.

General Order 95, Rule 46

Adopted Rule in Final Form

46 Vertical Strength Requirements

In computing vertical strength requirements, the loads upon Lines (See Rule 22.1) shall be their own weight plus the vertical loads which they support under the conditions of Rule 43, together with the effect of any difference in elevation of supports.

On structures with crossarms or guard arms, the vertical loads on the structure shall include a load of 300 lbs. at one end of one of the arms.

Safety factors shall apply as specified in Rule 44.

General Order 95, Rule 47

Adopted Rule in Final Form

47 Longitudinal Strength Requirements

In computing the longitudinal strength requirements of Lines (See Rule 22.1), the longitudinal load shall be considered as that due to the maximum working tension under the conditions specified in Rule 43.

Safety factors shall apply as specified in Rule 44.

47.1 Use of Guys and Braces

The longitudinal strength requirements for poles, towers and other supporting structures shall be met either by the structure alone or with the aid of guys and/or braces. Deflection shall be limited by guys and/or braces where such structures alone, although providing the strength and safety factors required, would deflect sufficiently under the prescribed loadings to reduce clearances below the required values.

General Order 95, Rule 48

Adopted Rule in Final Form

48 Strength of Materials

Structural members and their connection shall be designed and constructed so that the structures and parts thereof will not fail or be seriously distorted at any load less than their maximum working loads (developed under the current construction arrangements with loadings as specified in Rule 43) multiplied by the safety factors in Rule 44.

Values used for the strength of material shall comply with the safety factors specified in Rule 44.

General Order 95, Rule 48.1

Adopted Rule in Final Form

48.1 Wood

A. Natural Wood (Non Laminate)

1. Poles

Wood poles shall be designed and constructed so that poles will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the safety factors specified in Rule 44. The required strength of natural wood poles that comply with ANSI O5.1-2008 shall be derived by using the designated fiber strength specified in ANSI 05.1-2008. Table 5 lists some of the values of fiber strength specified in ANSI 05.1-2008.

2. Sawn Wood Structural Members

Sawn wood structural members, such as crossarms and braces, shall be designed and constructed so they will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the safety factors specified in Rule 44. The required strength of sawn wood structural members that comply with ANSI O5.3-2008 shall (a) be derived by using the designated fiber strength specified in ANSI O5.3-2008, and (b) take into account whether the sawn wood structural member(s) will be used for short-term loading (continuous load for less than one year) or long-term loading (continuous load for one year or more).

B. Laminated Wood

Laminated wood poles and other structural members, such as crossarms, shall be designed and constructed so they will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the safety factors specified in Rule 44. The required strength of laminated wood poles and other structural

members that comply with ANSI O5.2-2006 shall be derived by using the designated strength specified in ANSI O5.2-2006.

Table 5
Sample Wood Strengths
Specified in ANSI 05.1-2008

Species	Designated Fiber Strength
Cedar, western red	6,000 lbs per square inch
Douglas fir	8,000 lbs per square inch
Fir, white or red, local	6,600 lbs per square inch
Pine, southern	8,000 lbs per square inch

General Order 95, Rule 48.2

Adopted Rule in Final Form

48.2 Steel

Overhead line structures and subcomponents made from steel shall be designed and constructed so they will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the safety factors specified in Rule 44. The required strength of steel structures and components shall be derived using ASCE 10-97 for latticed steel structures and ASCE 48-11 for tubular steel pole structures, as applicable.

Steel members not covered by either of these standards shall be designed using allowable stresses as defined below:

Tension: The maximum allowable tensile stress shall be calculated using the following formula:

$$F_t = \frac{1}{SF}(F_y)$$

Compression: The maximum allowable compressive stress shall be calculated using the following formula:

$$F_a = \frac{1}{SF}\left[F_y - \left(\frac{F_y - 12{,}000}{200}\right)\frac{l}{r}\right]$$

Shear: The maximum allowable shear stress shall be calculated using the following formula:

$$F_v = \frac{1}{SF}\,0.66\,(F_t)$$

Bending: The maximum allowable bending stress for a compact section shall be calculated using the following equation:

$$F_b = \frac{1}{SF}F_y$$

The maximum allowable bending stress for a non-compact section shall be determined according to the provisions of Chapter E of the AISC *Manual of Steel Construction, Allowable Stress Design*, 9th Edition.

Combined Stresses: The strength of members subjected to combined stresses shall be determined according to the provisions of Chapter H of the AISC *Manual of Steel Construction, Allowable Stress Design*, 9th Edition.

Where,
Fa = maximum allowable axial stress, psi
Fb = maximum allowable bending stress, psi
Ft = maximum allowable tensile stress, psi
Fv = maximum allowable shear stress, psi
Fy = specified minimum yield stress, psi
Fu = specified minimum tensile stress, psi
SF = safety factor as specified in Rule 44
l = unsupported length of member, inches
r = radius of gyration of member, inches

The values used for specified minimum yield stress, Fy, and specified minimum tensile stress, Fu, shall be the values as listed in the appropriate ASTM specification. If the material specification for the steel is unknown and cannot be determined, the values for Fy and Fu and shall be assumed to be 33,000 psi and 60,000 psi, respectively. The modulus of elasticity, E, is defined to be 29,000 ksi.

General Order 95, New Rule 48.4

Note: This Decision Adopts an Entirely New Rule 48.4 and Renumbers the Existing Rules 48.4 – 48.6 Accordingly

48.4 Fiber-Reinforced Polymer

Overhead line structures and subcomponents made with fiber-reinforced polymer material shall be designed and constructed so they will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the safety factors specified in Rule 44. This requirement applies to tension and bending, compression and bending, and shear.

The compressive strength of the material shall be determined by suitable formula for the material or structure, considering the strength of the material, modulus of elasticity, geometry, slenderness ratio and eccentricity of connection.

Note: The strength may be determined per Section 2.6.2 of ASCE 111-2006.

General Order 95, Renumbered Rule 48.5

Adopted Rule in Final Form

Rule 48.5 Other Engineered Materials

Overhead line structures and subcomponents made with other engineered materials shall be designed and constructed so they will not fail or be seriously distorted at any load less than the maximum working loads (developed with the loadings specified in Rule 43) multiplied by the safety factors specified in Rule 44. This requirement applies to tension, compression, and shear.

Tension: If the material has a published yield strength value, that value shall be used in lieu of the tensile strength value.

Compression: The compressive strength shall be determined by suitable formula for the material used and member geometry, considering yield and /or tensile strength of the material, modulus of elasticity, slenderness ratio and eccentricity of connection. In no case shall the compressive stress be greater than the yield strength of the material.

Note: The strength may be determined per Section 2.6.2 of ASCE 111-2006.

General Order 95, Renumbered Rule 48.6

The renumbered Rule 48.6 is the same as the previous Rule 48.5,

With the title Conductors, Span Wires, Guys and Messengers

General Order 95, Renumbered Rule 48.7

Adopted Rule in Final Form

Note: The Previous Rule 48.7 is Deleted.

48.7 Tower or Pole Foundations and Footings

The resistance of soil to foundation or footing bearing and uplift shall be calculated from the best available data or determined by test(s).

Foundation or footing resistance shall be designed with the safety factors applied as specified in Rule 44.

General Order 95, Rule 49.1-A

Adopted Rule in Final Form

49.1 Poles, Towers and Other Structures

A. Strength (See Rule 48)

(1) Wood poles shall be of sound timber.

(2) In cases where lateral loads on a pole or structure require the use of a guy(s), the pole or structure below the point of the guy attachment shall be considered merely a strut, the guy(s) taking all lateral loads. In such cases, the pole strength requirement shall apply at the point of guy attachment rather than at the ground line.

General Order 95, Rule 49.1-B

Adopted Rule in Final Form

49.1 Poles, Towers and Other Structures

B. Dimensions

The minimum top circumference of wood poles shall not be less that the following:

	Inches
Grade "A" Heavy loading district	22
Grade "A" Light loading district	19
Grade "B" * Heavy and light loading districts	19
Grade "C" Heavy and light loading, urban districts	19
Grade "C" Circuits of 750-7,500 Volts, heavy loading, rural districts	19
Grade "C" Supply circuits of 0-750 Volts and communication circuits, heavy loading rural districts	16
Grade "C" Light loading, rural districts	16

* Supply Poles in Grade "B" construction in rural, light loading districts may have a top circumference not less than 16 inches.

* Communication Poles in Grade "B" construction at crossings over major railroads may have a top circumferences not less than 16 inches provided such poles meet the specifications of ANSI O5.1-2008.

General Order 95, Rule 49.1-C

Adopted Rule in Final Form

49.1 Poles, Towers and Other Structures

B. Setting of Poles

The depths of pole setting given in Table 6 are applicable to poles set in firm soil or in solid rock.

Where the resultant bearing surface is not sufficient to prevent overturning or excessive movement of the pole at the ground line, and/or the soil is not firm, deeper settings or other special methods shall be used.

Where poles were set in firm soil, but the soil has since been excavated or subjected to erosion, the minimum embedment shall be no less than 90% of the values specified in Table 6.

Table 6: Minimum Pole Setting Depths

Total Length of Pole (feet)	Depth in Soil (feet)	Depth in Rock (feet)
20	4	3
25	4 1/2	3
30	5	3
35	5	3 1/2
40	5 ½	3 1/2
45	6	4
50	6 1/2	4
55	7	4 1/2
60	7	4 1/2
65	7 1/2	5
70	7 1/2	5
75	8	5 1/2
80	8	6

General Order 95, Rule 49.2-A

Adopted Rule in Final Form

49.2 Crossarms

A. Material (See Rule 48)

Metal crossarms shall be protected by a corrosion resistant treatment or composed of material which is corrosion resistant.

General Order 95, Rule 49.2-C

Adopted Rule in Final Form

49.2 Crossarms

C. Strength

Crossarms shall be securely supported by bracing, where necessary, to withstand unbalanced vertical loads and to prevent tipping of any arm sufficiently to decrease clearances below the values specified in Section III. Such bracing shall be securely attached to poles and crossarms. Supports in lieu of crossarms shall have means of resisting rotation in a vertical plane about their attachment to poles or shall be supported by braces as required for crossarms. Metal braces or attachments shall meet the requirements of Rules 48.2 and 49.8.

In addition to the above, a vertical load of 300 lbs. at the outer pin position shall be included in computing the vertical loads on all crossarms.

General Order 95, Rule 49.2-E

Adopted Rule in Final Form

49.2 Crossarms

E. Guard Arms

Guard arms shall: (i) be made of wood or other suitable material; (ii) be at least 48 inches in length; and (iii) meet the insulating efficiency of Rule 22.8. Each guard arm, including support elements, shall

withstand a vertical load of 300 lbs. at either end.

General Order 95, Rule 49.4-B, Table 8

Adopted Rule in Final Form

Table 8: Minimum Conductor Sizes (150–Foot Spans or Less)						
Loading Conditions and Grade of Construction	Material or Type of Conductor					
	Soft or Annealed Copper	Hard–Drawn or Medium Hard–Drawn Copper	Stranded Aluminum	Aluminum Conductor Steel Reinforced	Copper Covered Steel, Bronze or Composites	Galvanized Iron or Galvanized Steel
	AWG	AWG	AWG	AWG	AWG	
Heavy Loading						
Grade " A"	4	6	1	4	6	¼ inch Diameter Strand
Grade " B" (a) (h)	4	6	1	6	8	9 BWG
Grade " C" (h)	4	6	1	6	8	9 BWG
Light Loading						
Grade "A"	4	6	1	4	8	¼ inch Diameter Strand (b)
Grade "B" (a) (c) (h)	6	6	1	6	8	9 BWG
Grade "C" (c) (h)	6	8	1	6	10	9 BWG
Heavy and Light Loading						
Supply Service Drops Crossing Trolley Wires	8	10	-	-	12	-
Other Supply Service Drops	10	10	-	-	12	-
Grade "C", Single Conductors (d)	-	(e)	-	-	(e)	14 BWG
Grade "C", Paired Conductors (d)	-	14(f)			17(g)	-

General Order 95, Rule 49.4-C(5)

Adopted Rule in Final Form

49.4 Crossarms

C. Strength

(5) Sags and Tensions: Sags shall be such that under the loading conditions specified in Rule 43 the tension in the cable or conductor shall not be more than one–half of its breaking strength. There are no strength requirements for the cable or conductor when supported by a messenger. See Rule 49.7-B for the strength requirements for messengers supporting cables or conductors.

Where the minimum size pins are used, the conductor tensions shall be limited to 2,000 pounds when applying the double arm, pin and conductor fastening provisions of Rules 49.2 and 49.3.

General Order 95, Rule 49.7-B

Adopted Rule in Final Form

49.7 Messengers and Span Wires

B. Strength

Messengers and span wires shall be capable of withstanding, with safety factors as specified in Rule 44, the tension developed because of the load they support combined with the loading conditions specified in Rule 43. An allowance of 300 lbs. of vertical load for a worker and cable chair shall be made in computing tensions in messengers and span wires which support cables except in the case of short spans which are not required to support workers or where the ice loading specified in Rule 43.1–B would exceed the allowance for the worker and cable chair.

Guys supporting messenger loads shall comply with the safety factors specified in Rule 44.

General Order 95, Rule 49.7-C
Adopted Rule in Final Form

49.7 Messengers and Span Wires

C. Supports

Messengers supporting cables shall be attached to poles or crossarms with hardware that complies with the safety factors specified in Rule 44, based on the weight of the messenger wire, cable, line-mounted equipment plus an allowance of 300 lbs. for a worker and cable chair. If in heavy loading areas the specified ice load exceeds in weight the 300 lbs. allowance, such ice load shall be used in making the calculations in preference to the weight of the worker and cable chair.

General Order 95, Rule 49.8
Adopted Rule in Final Form

49.8 Hardware

All pole line hardware shall be galvanized, otherwise protected by a corrosion–resistant treatment, or shall be composed of material which is corrosion resistant.

General Order 95, Rule 54.10-E
Adopted Rule in Final Form

54.10 Low Voltage Multiconductor Cable with bare Neutral, 0 - 750 Volts

E. Conductor Material and Strength

(1) Insulation: The phase conductors, and their jumper connections, excluding jumper connections at the pole, shall be covered with insulation suitable for the voltage involved and shall conform with the requirements of Rule 20.9-G. Jumper connections at the pole shall comply with the clearance requirements of Table 2, Case 17-D.

(2) Messenger: Where multiconductor cables are not maintained by workers using a cable chair, the additional allowance of the 300 lbs. of vertical load specified in Rule 49.7–B may be reduced to 75 lbs. to allow for the load imposed by workers on ladders.

General Order 95, Rule 54.10-G

Adopted Rule in Final Form

54.10 Low Voltage Multiconductor Cable with Bare Neutral, 0 - 750 Volts

G. Sags

The sags of messengers which support multiconductor cable shall be such that under the maximum loading conditions, the tensions in the messengers shall not exceed the safe working stresses specified in Rule 49.7–B. Where the multiconductor cables are not maintained by workers using a cable chair, the 300 lbs. additional allowance for vertical load specified in Rule 49.7–B may be reduced to 75 lbs. to allow for the load imposed by workers on ladders.

General Order 95, Rule 54.10-H

Adopted Rule in Final Form

54.10 Low Voltage Multiconductor Cable with bare Neutral, 0 - 750 Volts

H. Fastenings

Hardware used in connection with messengers shall meet the strength requirement of Rule 49.7–C. Deadend attachments used on messengers shall have a strength not less than that of the messenger. Where cables are not maintained by workers using a cable chair, the additional allowance of 300 lbs. vertical load specified in Rule 49.7–C may be reduced to 75 lbs. to allow for the load imposed by workers on ladders.

General Order 95, Rule 81.3-A
Adopted Rule in Final Form

81.3 Material and Strength

H. Replacement of Wood Poles in Grade C Construction

Wood poles in Grade C construction shall be replaced or reinforced before the safety factor has been reduced to less than one, except that the circumference of sound solid wood within 18 inches above and below the ground line on such poles before replacement or reinforcement shall not be less than as follows:

Poles supporting 10 or less open wire conductors	9 inches
Poles supporting cable, or more than 10 open wire conductors	12 inches

General Order 95, Rule 84.5
Adopted Rule in Final Form

84.5 Sags

The minimum conductor sags shall be such that under the specified loading conditions, the safety factor specified in Table 4, Rule 44 shall be met.

General Order 95, Rule 101.2
Adopted Rule in Final Form

101.2 Spliced or Stub-Reinforced Poles

See Rule 49.1-A(4).

General Order 95, Rule 111.3
Adopted Rule in Final Form

111.3 Spliced or Stub-Reinforced Poles

See Rule 49.1-A(4).

General Order 95, Appendix C

Adopted Appendix C in Final Form

Appendix C
Conductor Sags

(a) Basis of Sag Curves for Supply Conductors

Data are presented in Appendix C in the form of curves in Charts numbers 1 to 9 inclusive, showing conductor sags which produce tensions that do not exceed either 35% of ultimate strength of the conductor at 60°F. and no wind, or 50% of ultimate strength (safety factor of 2) of the conductor under the maximum loading conditions specified for Light or Heavy Loadings in Rule 43. These sags are considered particularly applicable to the stringing of new wire (i.e., they should be considered initial sags for conductors which have not been prestressed) and are not recommended in the case of used or so–called prestressed wire.

The curves of the sag charts were drawn from computations made under the following conditions:

1. Sag curves in the Light Loading charts are based on 35% of conductor ultimate tensions at 60° F. and no wind.
2. Sag curves in the Heavy Loading charts show sags which will obtain at 60°F. and no wind, in conductors which are so strung that under heavy loading conditions the conductor tension will be one–half of the ultimate tension.
3. The sag curves for weatherproof wire are for conductors having a triple–braid–weatherproof covering.
4. Conductor dimensions, weights and loadings were taken from the tables in Appendix B.
5. Modulus of Elasticity–lbs. per square inch

Copper	17,000000
Steel and iron, solid	29,000000
Steel, stranded	21,000000
Copper-covered steel, solid	24,000000
Copper-covered steel, stranded	23,000000

6. Coefficient of Linear Thermal Expansion – per degree F.

Copper	0.0000094
Steel and iron	0.0000065
Copper-covered steel	0.0000072

(b) Communication Conductor Sags

The safety factors of Rule 44 and the conductor sizes of Rule 49.4 are the minimum requirements applicable to communication conductors. Conductors will meet the minimum requirements of these rules for Grade "C" construction.

[Sections (c), (d), (e), and (f) are unchanged]

(g) Charts of Conductor Sag Curves

The following list includes charts of sags of various sizes and kinds of copper conductors, adjustment curves for temperature changes, sag adjustment curve for supports at different elevations, and a table of sags for communication conductors in Grade "C"construction:

Chart	Description
1	Conductor Sags, Light Loading, Bare Copper, Hard Drawn and Medium Hard
2	Conductor Sags, Light Loading, Weatherproof Copper Hard Drawn and
3	Conductor Sags, Heavy Loading, Bare Copper, Hard Drawn
4	Conductor Sags, Heavy Loading, Bare Copper, Medium Hard Drawn
5	Conductor Sags, Heavy Loading, Weatherproof Copper, Hard Drawn
6	Conductor Sags, Heavy Loading, Weatherproof Copper, Medium Hard Drawn
7	Sag Correction for Temperature - Copper
8	Sag Correction Factor - Supports at Different Elevations
9	Catenary Curve Ordinates

[Charts 1- 9: No change]

Table 25: Deleted MM/DD/YYYY by Decision No. YY-MM-###

General Order 95, Appendix D

Adopted Appendix D in Final Form

Appendix D
Typical Communication Line Construction

For a communication line carrying from approximately 6 to 20 conductors in a Light Loading area, the following specifications adequately meet all intents and requirements of this order:

Poles

Round, wood, butt–treated, 25 feet in length, minimum top circumference of 15 inches, and set to a depth of 4.5 feet in firm soil.

Crossarms

3–1/4 x 4–1/4 x 10′. Attached by means of through bolts and washers, with a 15 inches center line of pole clearance to nearest conductors. Standard 30 inches quarter braces installed on the face of the crossarm with 3/8 inch bolts and 1/2 inch drive screw at the pole.

Pins

1–¼′′ x 8′′ wood pins.

Insulators

Pin type insulators to be of design that will engage the thread of the pin for not less than two and one–half turns.

Conductors

Size and material dependent upon the class of circuit involved. The average span length is 150 feet.

Guys

For guying at angles or dead ends, it is recommended that a "Lead over Height" (ratio of the horizontal distance from the face of the pole to the point of entrance of anchor rod in the ground to the vertical height above the ground of the attachment of said guy wire to the pole) of 1 be used. At angles in the line where the pull of the line exceeds 4 feet, i.e., the angle of departure exceeds 5 degrees, a guy strand having a strength of l900 lbs (1/4 inch or greater) shall be used with the necessary pole shims, hook bolts, etc. (see Appendix G, Figure 86).

Hardware

All line hardware to be galvanized or of other corrosion resisting material.

(END OF APPENDIX B)

Appendix C: Fire Incident Data Collection Plan

Appendix C reproduces the Fire Incident Data Collection Plan in the Phase 3 Workshop Report and approved by this decision.

The attached Fire Incident Data Collection Plan includes non-substantive formatting and pagination revisions.

Fire Incident Data Collection Plan

SED details the data it recommends that electric utilities shall submit to the California Public Utilities Commission.

SED's Revised Data Collection Proposal is designed to provide information that will be useful in identifying operational and/or environmental trends relevant to fire-related events and to ensure this information is gathered, collected and reported in a simple format so as to: 1) allow data comparisons across several years and among utilities; and 2) improve regulations and/or internal utility standards to reduce the likelihood of fires.

In order to identify and assess systemic fire safety risks, SED intends to use the data to identify operational and/or environmental trends. Activities might include:

- Cross referencing the data to weather data
- Conducting a statistical analysis of the data to identify trends in the data
- Meeting with Investor Owned Utilities (IOUs) to discuss SED's statistical review of the data
- Meeting with fire agencies and Communication Infrastructure Providers (CIPs) on an as needed basis to gain more information

Once an operational and/or environmental trend is identified, additional root cause analysis may be required in order to diagnose the conditions that precipitate such results and formulate cost-effective measures to reduce systemic fire risks, SED intends to engage in one or more of the following activities:

- Conduct a cost-benefit analysis of mitigation measures with the IOUs and CIPs
- Hold meetings with one or more IOUs to discuss operational changes

- Initiate a rulemaking at the Commission to address the trend identified by SED
- Meet with CAL FIRE and other fire agencies

SED may meet with one or more IOU based upon data received at any time, at a minimum SED plans to meet with each IOU within six (6) months of receiving three years of fire data to discuss:

- The data collected
- SED's view of the data results
- The IOU's view of the data results

Furthermore, SED plans to meet with all IOUs and other key stakeholders to discuss the cost- benefit of this data collection process nine (9) months after the fifth year of submitting data. The purpose of that meeting(s) will be to review:

- The results of the data collected
- Costs associated with the data collection process
- Potential refinements to the data collection process

A. <u>Principles</u>

1. Any data collection proposal and subsequent data-reporting requirements adopted during R08-11-005 will be in addition to the incident-related reporting requirements to which the utilities are already subject.[1]

[1] See, *Commission Resolution E-4184*, August 21, 2008. E-4184 orders electric utilities to submit reports related to any incident where a utility's facilities are involved and the incident results in property damage exceeding $50,000, a fatality or injuries requiring in–patient hospitalization, and/or significant media attention.

2. Data should be consistent. Most fields will have either default formats or will be limited to drop down choices so that errors in data entry will be minimized.[2]
3. Any new fire-related reporting requirements should not be limited to fire events that occurred in "designated 'fire-threat' zones or districts". Setting reporting requirements for all areas instead of for just a limited area is consistent with various existing Commission reporting requirements.[3]
4. Fire-related reporting requirements should be limited to events that meet the following criteria.[4]

   For the purposes of the Data Collection Proposal, a reportable event is any event where utility facilities are associated with the following conditions:

   (a) A self-propagating fire of material other than electrical and/or communication facilities, and

   (b) The resulting fire traveled greater than one linear meter from the ignition point, and

   (c) The utility has knowledge that the fire occurred.

   Ignition Point is the location, excluding utilities facilities, where a rapid, exothermic reaction was initiated that propagated and caused the material involved to undergo change, producing temperatures greatly in excess of ambient temperature.
5. The information reported shall be objective and factual to the best of the utility's knowledge and shall not include speculation or attribution of fault or blame.

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[2] The following fields would be excluded from a standard format: Notes, Facility Identification, Other Companies and Suppressing Entity.

[3] *See* CPUC Resolution E-4184, GO 112-E, GO 165.

[4] Fires that caused damage to utility facilities and whose ignition is not associated with utility facilities are excluded from this reporting requirement.

6. The utilities should report data in an annual report for the previous calendar year (January through December) on or before April 1 of each year.
7. The data collected is raw data that is correct to the best of the utility's knowledge at the time of submission. Confidential data submitted will be protected in accordance with California law.

B. Fire-Related Data-Reporting Requirements

SED has provided examples of how each data field should be reported in the Microsoft Excel file titled *Revised Data Collection (*SED*)*. The data recommended by SED for gathering, collection and reporting are:

Utility Name:	Name of utility reporting the event;
Date[5]**:**	Date the event started;
Time[6] [7]**:**	The time the event started;
Location[8]:	Latitude and longitude coordinates of the point of ignition;
Material at Origin:	Material involved in the initial fueling of the fire;
Land Use at Origin:	Nature of land use in the vicinity of the point of the fire's origin (*i.e.*, Urban, Rural[9]);

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[5] The excel spreadsheet will change the date field to the following format MM/DD/YY if a valid date is entered.

[6] This field is only an estimate as in many cases the utility might not know the exact start time.

[7] The excel spreadsheet uses military time as the time format. To enter times between 1:00 pm and 12:59 am, either enter the PM/AM or enter the time in military time. Example enter 12:23AM as 12:23 AM or 00:23.

[8] Utilities should submit data as close as possible to the origin point of the event. Data given should be at least to the thousandths decimal place (i.e. X.000); more accuracy should be used when the utility has that knowledge.

[9] For the purpose of this Data Collection Proposal, "Rural" and "Urban" shall be the same definitions as those contained in General Order 165.

Size:	An approximation of the fire size;
Suppressed by:	Who suppressed the fire;
Suppressing Agency:	If the fire was suppressed by a fire agency or agencies, insert the lead agency when one or more agency was involved;
Facility Identification:	Utility's description of the pole and/or equipment involved;
Other Companies:	Other Companies that were attached to pole in question and known to the utility. If the facilities involved were not overhead leave this field blank;
Voltage:	Nominal voltage rating of all the utility equipment and/or circuit involved in the fire, use volts.
Equipment Involved With Ignition:	The equipment that supplied the heat that ignited the reported fire;
Type:	The equipment involved in the event (overhead, padmounted or subsurface);
Outage[10] [11]**:**	Was there an outage involved in the event;
Outage Date:	Outage Start Date, if one is associated with the event;
Outage Time:	Outage Start Time, if one is associated with the event;
Suspected Initiating Event:	The suspected initiating event based on initial field observations;

[10] For the purpose of this Data Collection Proposal, list the first outage associated with the event if multiple outages were involved.

[11] For the purpose of this Data Collection Proposal, exclude outages that were ordered by a governmental agency or were taken by the utility at its discretion.

Equipment /Facility Failure:	The specific equipment associated with the reported fire. (Only to be used if "Equipment/Facility Failure" is selected as Suspected Initiating Event);
Contact From Object:	The first object that contacted the Communication or Electric Facilities (Only to be used if "Contact from Object" is selected as Suspected Initiating Event);
Facility Contacted:	The first facility that was contacted by an outside object (Only to be used if "Contact from Object" is selected as Suspected Initiating Event);
Contributing Factor:	Factors that contributed to the ignition;
Notes:[12]	**An Optional Field**, list additional information that could be useful when examining data.

[12] This field will be blacked out when either "Communication Facility" is selected in the "Facility Contacted" Column or "Contact Between Third Party Facility on Pole and Supply Lines" is selected from the "Suspected Initiating Event" Column.

Utility Name	Fire Start		Location				Fire		
	Date	Time	Latitude	Longitude	Material at Origin	Land Use at Origin	Size	Suppressed by	Suppressing Agency
BVES	6/16/12	13:30	34.0497672	-118.2498957	Vegetation	Rural	Less Than .25 Acres	Customer	
Kirkwood Meadows	6/16/12	14:07	34.0497672	-118.2498957	Building	Urban	.26 - 9.99 Acres	Fire Agency	LA County
Liberty Energy	6/16/12	14:38	34.0497672	-118.2498957	Other		10 - 99 Acres	Self Extinguished	
PacifiCorp	6/16/12	14:53	34.0497672	-118.2498957			100 - 299 Acres	Unknown	
PG&E	6/16/12	14:55	34.0497672	-118.2498957			3000 - 999 Acres	Utility	
SCE	6/16/12	0:23	34.0497672	-118.2498957			1000 - 4999 Acres		
SDG&E	1/1/12	13:30					Greater than 5000 Acres		
							Less than three (3) meters of linear travel		
							Structure Only		

Utility Facility					Outage		
Facility Identification	Other Companies	Voltage (Volts)	Equipment Involved With Ignition	Type	Was There an Outage	Date	Time
P1235	[redacted]	12000	Capacitor Bank	Padmounted	Yes	6/16/12	13:30
Pole in rear of 32 5th Street	AT&T	21000	Conductor	Overhead	No	[redacted]	
P2535	None	21000	Fuse	Overhead			
Pole at intersection of Main and 4th	[redacted]	120	Lightning Arrestor	Subsurface			
P125646		21000	Other				
B125456		21000	Switch				
			Transformer				

Field Observations					Notes (Optional):
Suspected Initiating Event	**Equipment /Facility Failure**	**Contact From Object**	**Facility Contacted**	**Contributing Factor**	
Contact Between Third Party Facility on Pole and Supply Lines				Weather	
Contact From Object		Animal	Communication Facility	Human Error	
Contact From Object		Balloons	Electric Facility	Unknown	
Contact From Object		Other	Pole	Outside Force	
Contact From Object		Vegetation	Pole	Other	
Contact From Object		Vehicle	Pole		
Contact From Object		Unknown	Pole		
Contamination					
Equipment/Facility Failure	Capacitor Bank				
Equipment/Facility Failure	Conductor				
Equipment/Facility Failure	Fuse				
Equipment/Facility Failure	Insulator				
Equipment/Facility Failure	Lightning Arrestor				
Equipment/Facility Failure	Pole				
Equipment/Facility Failure	Guy/Span Wire				
Equipment/Facility Failure	Other				
Equipment/Facility Failure	Protective Relay				
Equipment/Facility Failure	Crossarm				
Equipment/Facility Failure	Recloser				
Equipment/Facility Failure	Sectionalizer				
Equipment/Facility Failure	Splice/Clamp/Connector				
Equipment/Facility Failure	Switch				
Equipment/Facility Failure	Transformer				
Equipment/Facility Failure	Voltage Regulator				
Normal Operation					
Other					
Unknown					
Vandalism/Theft					
Wire-Wire Contact					

(END OF APPENDIX C)