APPENDIX A – CONSENSUS PROPOSED RULE CHANGES

WR-PRC#	GO 95 Rule	Rule Title	Original Proposal Number(s)	Page No.
1	Rule 42	Grades of Construction	PRC 1	A-2
2	Rule 43	Temperature and Loading	PRC 2 & PRC 3	A-7
3	Rule 43.1C	Heavy Loading Temperature	PRC 3	A-10
4	Rule 43.2C	Light Loading Temperature	PRC 3	A-13
5	Rule 44	Safety Factors	PRC 20 (AP 1)	A-16
6	Rule 44.1	Installation and Reconstruction	PRC 4	A-20
7	Rule 44.1	Table 4 Minimum Safety Factors	PRC 5	A-23
8	Rule 44.2	Additional Construction	PRC 6	A-28
9	Rule 44.3	Replacement	PRC 7 & PRC 22 (AP 4)	A-31
10	Rule 45	Transverse Strength Requirements	PRC 8	A-35
11	Rule 46	Vertical Strength Requirements	PRC 9 (AP 5)	A-39
12	Rule 47	Longitudinal Strength Requirements	PRC 10	A-42
13	Rule 48, 48.7	Ultimate Strength of Materials	PRC 11	A-46
14	Rule 48.6	Tower or Pole Foundations and Footings	PRC 23 (AP11)	A-50
15	Rule 49.1A (1), (2) & (3)	Poles, Towers and other Structures	PRC 12 & PRC 24 (AP 12)	A-53
16	Rule 49.1B	Dimensions and Footnotes to Table	PRC 1 & PRC 25 (AP13)	A-57
17	Rule 49.1C	Setting of Poles and Table 6	PRC 13 & PRC 14	A-63
18	Rule 49.2A	Crossarms – Material	PRC 15	A-69
19	Rule 49.2C	Crossarms – Strength	PRC 9	A-72
20	Rule 49.2E	Crossarms – Guard Arm	PRC 9	A-75
21	Rule 49.4B	Table 8 - Minimum Conductor Sizes	PRC 26 (AP 16)	A-78
22	Rule 49.4C(5)	Sags and Tensions	PRC 16	A-83
23	Rule 49.7B	Strength	PRC 16	A-86
24	Rule 49.7C	Supports	PRC 16	A-89
25	Rule 49.8	Hardware	PRC 17	A-92
26	Rule 54.10E	Conductor Material Strength	PRC 16	A-94
27	Rule 54.10H	Fastenings	PRC 16	A-97
28	Rule 81.3	Material and Strength	PRC 7 & PRC 22	A-100
29	Rule 84.5	Sags	PRC 26 (AP 16)	A-103
30	Rule 101.2	Spliced or Stub-Reinforced Poles	PRC 18	A-106
31	Rule 111.3	Spliced or Stub-Reinforced Poles	PRC 19	A-108
32	Appendix C	Conductor Sags and Table 25	PRC 26 (AP 16)	A-110
33	Appendix D	Typical Communication Line Construction	PRC 26 (AP 16)	A-123

WR-PRC 1 – RULE 42 – GRADES OF CONSTRUCTION

(1) Current Rule

42 Grades of Construction

For all classes of lines, the relative order of grades is "A", "B", "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	Grade B
Class H supply	Grade B
Class L supply	Grade C
Class C communication	Grade 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.

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"
C	Under all conditions not required to be Grade "A", "B", or "C"	"F"

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

(2) Strikeout/Redlined Proposed Changes

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.

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.~~

(3) Proposed Final

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"

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(4) History of Proposed Rule Change History of Proposed Rule Change (*PRC 1)*

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee to remove references to an obsolete Grade of Construction –Grade "F". It was originally submitted as PRC 1 in the Panel 1 Technical Report.

(5) Consensus Rationale

Consistent with the goal of "revising Section IV to reflect modern materials and practices", references throughout Section IV and other Sections of GO 95 to an obsolete Grade of Construction – Grade "F" – have been eliminated. These changes are also reflected in WR-PRC 7, WR-PRC 9, WR-PRC 16, WR-PRC 28, WR-PRC 29, WR-PRC 32, and WR-PRC 33. With the elimination of Grade "F", Grade "C" becomes the lowest Grade of Construction. These changes will require new facilities to be built to higher safety factors. WR-PRC 1 eliminates the Grade F references in Rule 42 and Table 3.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIPs and any electric utilities with communications facilities on stand-alone poles.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC modifies GO 95 to reflect modern materials and/or practices. By doing such it will aid in ensuring consistency in compliance, which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC modernizes and clarifies GO 95.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Because the proposal deletes a Grade of Construction that is obsolete, it is anticipated that any cost impacts to the CIPs and electric utilities would be negligible.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be negligible. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because it simplifies GO 95, modernizes the rules and advances clarity. The PRC eliminates the lowest Grade of Construction which in turn increases the applicable safety factor that communication facilities must meet at time of construction.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC does not apply to electric transmission facilities.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 2 – RULE 43 – TEMPERATURE AND LOADING

(1) Current Rule

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. More stringent conditions may be used, if desired, in the design of lines. The use of modified 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.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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.

(4) History of Proposed Rule Change (PRC 2)

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee in order to clarify certain terms in GO 95. It was submitted as PRC 2 in the Panel 1 Technical Report. The PRC was then modified slightly during the workshops to add further clarity to the rule.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED, this proposed change incorporates the defined term "Lines" and clarifies the terms "loading" or "loads" as used throughout Section IV of GO 95.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIP and electric utilities.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC clarifies GO 95. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC clarifies GO 95.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Because this PRC clarifies terms in GO 95, it is anticipated that any cost impacts to the CIPs and electric utilities would be negligible.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be negligible. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because it clarifies GO 95 and gives electric utilities and CIPs clear guidance as to how to build and maintain their facilities.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 3 – RULE 43.1C – HEAVY LOADING TEMPERATURE

(1) Current Rule

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.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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.

(4) History of Proposed Rule Change (PRC 3)

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee in order to clarify the use of conductor and ambient temperatures in calculating structural loads. It was submitted as PRC 3 in the Panel 1 Technical Report. The PRC was then modified at the workshop to add further clarity to the rule and to address concerns of some parties.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED, this proposed change clarifies the use of conductor and ambient temperatures in calculating structural loads.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIP and electric utilities.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC clarifies GO 95. By doing such it will aid in ensuring consistency in compliance, which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC clarifies GO 95.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

This PRC is a clarification only and it is anticipated that any cost impacts on CIPs and electric utilities will be negligible.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be negligible. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because it simplifies GO 95, modernizes the rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 4 – RULE 43.2C – LIGHT LOADING TEMPERATURE

(1) Current Rule

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.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

43.2 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.

(4) History of Proposed Rule Change (PRC 3)

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee in order to clarify the use of conductor and ambient temperatures in calculating structural loads. The PRC was then modified at the workshop to add further clarity to the rule and to address concerns of some parties. It was submitted as PRC 3 in the Panel 1 Technical Report, and renumbered to WR-PRC 4 for purposes of this Workshop Report.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED, this proposed change clarifies the use of conductor and ambient temperatures in calculating structural loads.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIP and electric utilities.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC clarifies GO 95. By doing such it will aid in ensuring consistency in compliance, which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC clarifies GO 95.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

This PRC is a clarification only and it is anticipated that any cost impacts on CIPs and electric utilities will be negligible.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be negligible. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because it simplifies GO 95, modernizes the rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 5 – RULE 44 – SAFETY FACTORS

(1) Current Rule

44 Safety Factors

The safety factors specified in these rules are the minimum allowable ratios of material strengths to the maximum working stresses, except that:

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.

(2) Strikeout/Redlined Proposed Changes

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.~~

(3) Proposed Final

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.

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

(4) History of Proposed Rule Change (APs 1A, 1B & 1C, PRC 20)

The Panel 1 Technical Committee developed competing proposals to address the consistent application of safety factors for all materials and line elements under all loading conditions specified in GO 95 (APs 1A and 1B in the Panel 1 Technical Report). At the all-party workshops, an additional proposal (AP 1C) was presented for consideration. During the workshops parties reached consensus, and the proposal became consensus PRC 20. This proposal was then renumbered as WR-PRC 5 for purposes of this Workshop Report.

(5) Consensus Rationale

Consistent with the goal of providing clear guidance to electric utilities and CIPs, this PRC removes unnecessary language and supports the consistent application of safety factors for all materials and line elements under all loading conditions specified in GO 95. The PRC also eliminates use of 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.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIP and electric utilities.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC clarifies GO 95. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the

changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC clarifies GO 95.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

This PRC is a clarification only and it is anticipated that any cost impacts on CIPs and electric utilities will be negligible.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be negligible. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because it simplifies GO 95, modernizes the rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply

because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 6 – RULE 44.1 – INSTALLATION AND RECONSTRUCTION

(1) Current Rule

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.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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.

(4) History of Proposed Rule Change

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee. The PRC was then modified during the workshops to add further clarity to the rule and to address concerns of some parties.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED, this proposed change aligns this rule with the proposed revision to Rule 43 in PRC 2 (WR-PRC 2).

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 7 – RULE 44.1 – TABLE 4 MINIMUM SAFETY FACTORS

(1) Current Rule

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 metallic members of foundations	1.5 (c)	1.25 (c)	1.25 (c)	-
Reinforced concrete poles	4	3	3	-
Prestressed 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	1.5	1.25	1.25	-
Concrete	1.8	1.5	1.5	-
Other structural engineered materials	1.5	1.25	1.25	-

(2) Strikeout/Redlined Proposed Changes

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	~~-~~

(3) Proposed Final

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

(4) History of Proposed Rule Change

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee. The PRC was then modified during the workshops to add further clarity to the rule and to address concerns of some parties.

(5) Consensus Rationale

Consistent with the goal of "revising Section IV to reflect modern materials and practices", references throughout Section IV and other Sections of GO 95 to an obsolete Grade of Construction – Grade "F" – have been eliminated. See WR-PRCs 1, 7, 9, 16, 28, 29, 32 and 33. With the elimination of Grade "F", Grade "C" becomes the lowest Grade of construction. These changes will require new facilities to be built to higher safety factors.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to modernize Section IV of GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules, modernizes the rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 8 – RULE 44.2 – ADDITIONAL CONSTRUCTION

(1) Current Rule

44.2 Additional Construction

Any entity planning the addition of facilities that materially increase vertical, transverse or longitudinal loading 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.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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 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.

(4) History of Proposed Rule Change

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee. The PRC was then modified during the workshops to add further clarity to the rule and to address concerns of some parties.

(5) Consensus Rationale

Rule 44.2 - Consistent with the goal to provide electric utilities and CIPs with clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED, this proposed change aligns this rule with the proposed revision to Rule 43 in PRC 2 (WR-PRC 2).

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will help to clarify GO 95.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

- Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 9 – RULE 44.3 – REPLACEMENT

(1) Current Rule

44.3 Replacement

Lines or parts thereof shall be replaced or reinforced before safety factors have been reduced (due to 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" construction 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.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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.

(4) History of Proposed Rule Change

As a follow up to PRC-7 submitted in the Panel 1 Technical Report, Alternate Proposal (AP) 4 was developed during the workshops to clarify that the causes of safety factor reductions identified in the parenthetical statement in the opening sentence of the rule are only examples; other causes may exist. AP 4, designated as PRC 22 for workshop tracking purposes, includes the changes previously submitted in PRC 7.

(5) Consensus Rationale

Elimination of Reference to Grade F - Consistent with the goal of "revising Section IV to reflect modern materials and practices", references throughout Section IV and other Sections of GO 95 to an obsolete Grade of Construction – Grade "F" – have been eliminated. *See* WR-PRCs 1, 7, 9, 16, 28, 29, 32 and 33. With the elimination of Grade "F", Grade "C" becomes the lowest Grade of construction. These changes will require new facilities to be built to higher safety factors.

Clarification of Parenthetical Statement - The added words "factors such as" clarify that the 2/3 factor also accounts for other considerations in practical field operations (such as rearrangements) which may also lower the safety factor to less than the original required value at installation.

Addition of Note - The addition of the note guides a reader that not all safety factors can be reduced by the amounts specified by either one-third or one-half. The current safety factors for guy insulators in Grades "B" and Grade "C" construction can only be reduced to 95% and 75% respectively.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) *proposed revisions in strikeout/underline form, and (ii) the final proposed rule.*

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern materials and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, will reduce the risk that affected facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services. Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply

because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 10 – RULE 45 – TRANSVERSE STRENGTH REQUIREMENTS

(1) Current Rule

45 Transverse Strength Requirements

In computing the transverse strength requirements of 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 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 where, due to change of direction in conductors, an unbalanced side stress is imposed on the supporting structure, a 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 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.

(2) Strikeout/Redlined Proposed Changes

45 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.

(3) Proposed Final

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.

(4) History of Proposed Rule Change (PRC 8)

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee and submitted in the Panel 1 Technical Report.

(5) Consensus Rationale

This PRC is consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED; this proposed change aligns this rule with the proposed revision to Rule 43 in WR-PRC 2.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95 and will align Rules 45 and 45.1 with proposed revisions to Rule 43.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern materials and/or practices. By doing so, it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, the proposed revision will reduce the risk that affected facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 11 – RULE 46 – VERTICAL STRENGTH REQUIREMENTS

(1) Current Rule

46 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.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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.

(4) History of Proposed Rule Change

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee and submitted in the Panel 1 Technical Report.

(5) Consensus Rationale

Several rule changes were proposed to address the increased weight of workers and their equipment from 200 to 300 pounds. These changes are reflected in WR-PRCs 11, 19, 20, 23, 24, 26, and 27. These rule changes are consistent with the goal to revise GO 95 to reflect modern materials and practices and to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED.

PRC 9 also clarifies that the vertical load added to a structure to account for the weight of a worker and equipment, as described in Rule 49.7, should be applied once to one of the arms on the structure and not to each arm on the structure.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other *objectives.*

See Rationale. This PRC will modify GO 95 to reflect modern materials and/or practices. By doing so, it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, the proposed revision will reduce the risk that affected facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

The impact on costs, if any, is anticipated to be insignificant.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 12 – RULE 47 – LONGITUDINAL STRENGTH REQUIREMENTS

(1) Current Rule

47 Longitudinal Strength Requirements

In computing the longitudinal strength requirements of structures, or any parts thereof, 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.

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 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 or braces. Deflection shall be limited by guys 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.

(2) Strikeout/Redlined Proposed Changes

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.~~

(3) Proposed Final

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.

(4) History of Proposed Rule Change

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee and submitted in the Panel 1 Technical Report.

(5) Consensus Rationale

Consistent with the goal of providing electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED; this proposed change aligns this rule with the proposed revision to Rule 43 in WR-PRC 2.

Further, the revisions to 47.1 and 47.3 remove unnecessary advisory information and align this rule with proposed changes to Rule 44 in WR-PRC 5.

(6) Justification

- <u>The specific electric utilities, CIPs, and others affected by the PRC.</u>

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95 and aligns this rule with proposed revisions to Rules 43 and 44.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern materials and/or practices. It will aid in ensuring consistency in compliance, which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, the proposed revisions reduce the risk that affected facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules, advances clarity and aligns the rule with proposed revisions to other rules.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 13 – RULE 48 and 48.7 – ULTIMATE STRENGTH OF MATERIALS

(1) Current Rule

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 factor in Rule 44.

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

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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.

(4) Current Rule

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: The 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.

(5) Strikeout/Redlined Proposed Changes

~~**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: The 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.~~

(6) Proposed Final

No Rule

(7) History of Proposed Rule Changes *(PRC 11)*

This PRC was a consensus rule change recommended by the Panel 1 Technical Committee.

(8) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED, this proposed change corrects the misuse of the term "ultimate" as it applies to the strength characteristics of different types of materials.

(9) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) and 4 above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2), (3), (5) and (6) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable

- Why it is in the public interest to adopt the PRC.

The proposed revisions simplify GO 95 and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 14 – RULE 48.6 – TOWER OR POLE FOUNDATIONS AND FOOTINGS

(1) Current Rule

48.6 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 foundations or footing shall be calculated from the best available data on the soil in question. In lieu of calculation, the strength of foundations or footings against uplift or depression may be determined by tests under the soil conditions prevailing.

(2) Strikeout/Redlined Proposed Changes

48.6 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.

(3) Proposed Final

48.6 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.

(4) History of Proposed Rule Change (AP 11/ PRC 23)

The Phase 3 Panel 1 Report, AP 11, contained the first proposed revision to this rule. This PRC was subsequently revised during the workshops by a technical work group and became a consensus rule change proposal.

(5) Consensus Rationale

This rule covers the design of foundations in uplift, which is the tendency of the tower foundation to pull out of the ground. The current version of the rule was written specifically for a "spread footer" on a four legged lattice steel tower where the resistance to uplift is provided by the weight of the foundation and the backfill above the grillage or spread footer. The weight of the backfill is usually assumed to be the dry weight of the soil or rock used to backfill the excavation. Dry weights are also used for the weight of the steel and concrete in the foundation. The assumption of dry weight is not a conservative assumption in areas where the water table is above the base of the footer. For this reason, the buoyant weight of the backfill and foundation should be used; i.e., the weight of the foundation (steel and/or concrete) and backfill (soil or rock) should be reduced by the weight of water, which may be assumed to be 62.4 pounds per cubic foot.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves *other objectives.*

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services

- Not applicable. Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revisions simplify GO 95 and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 15 – RULE 49.1 A(1), (2), & (3) – POLES, TOWERS AND OTHER STRUCTURES

(1) Current Rule

49.1 Poles, Towers and Other Structures

A. Strength

(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.

(3) In cases where lateral stresses 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. In such cases, the pole strength requirement shall apply at the point of guy attachment rather than at the ground line.

(2) Strikeout/Redlined Proposed Changes

49.1 Poles, Towers and Other Structures

A. Strength <u>(See Rule 48)</u>

(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) 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.

(3) Proposed Final

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.

(4) History of Proposed Rule Change (*PRC 12 and AP 12/PRC 24*)

WR-PRC 15 is a combination of PRC 12 and AP's, AP 12-A and 12-B developed by the Phase 3 Panel 1 Technical Committee. After further discussion in the workshops, AP 12-B was dropped and AP 12-A was slightly modified, resulting in consensus PRC 24. PRC 24 was combined with PRC 12 and renumbered WR-PRC 15.

(5) Consensus Rationale

WR-PRC 15 proposes to delete unnecessary text from Rules 49.1 A(1) and A(2). These two sections specify required strengths and loads for wood and non-wood poles and foundations, and only reiterate what is stated in Rules 43, 44 and 48, with one exception, the use of the term "sound timber." This proposal deletes this duplicate information found in other Section IV rules.

This WR-PRC also proposes to replace the term "stresses" with "loads" in rule 49.1 A(3) to be more technically correct and to align it with the proposed change to Rule 43.

The rule was renumbered accordingly.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revisions simplify GO 95 and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC16 – RULE 49.1B – DIMENSIONS AND FOOTNOTES TO TABLE

(1) Current Rule

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 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:

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

(2) Strikeout/Redlined Proposed Changes

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~~

(3) Proposed Final

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	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.

(4) History of Proposed Rule Change (*AP 13*)

The Phase 3 Panel 1 Report, AP 13, contained the first proposed revisions to rule 49.1 B. AP 13 was revised during the workshops by a technical work group, resulting in consensus WR-PRC 16.

(5) Consensus Rationale

Consistent with the goal of "revising Section IV to reflect modern materials and practices", references throughout Section IV and other Sections of GO 95 to an obsolete Grade of Construction – Grade "F" – have been eliminated. See WR-PRCs 1, 7, 9, 16, 28, 29, 32 and 33. With the elimination of Grade "F", Grade "C" becomes the lowest Grade of construction. These changes will require new facilities to be built to higher safety factors.

WR-PRC 16 eliminates the Grade F references in Rule 49.1 B.

The standards for wood poles referenced in the footnotes to the table in 49.1 B are outdated. The proposed changes update the footnotes to reference the applicable ANSI standard. This version of the ANSI standard provides improved material quality and strength specifications for all three of the species of wood poles.

In addition, the table associated with the second footnote was deleted as it provides requirements for poles associated with open wire communication which is an obsolete type of construction.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be minimal. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of

this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revisions simplify GO 95 and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 17 – RULE 49.1C – SETTING OF POLES AND TABLE 6

(1) Current Rule

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.

Table 6: 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

(2) Strikeout/Redlined Proposed Changes

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

(3) Proposed Final

49.1 Poles, Towers and Other Structures

C. 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

(4) History of Proposed Rule Change (*PRC 13*)

The text of the rule change proposals associated with PRCs 13 and 14, from the Phase 3 Panel 1 Technical Report, was unchanged and combined into WR-PRC 17.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED, this proposed change to Rule 49.1C simplifies and clarifies the requirements in this rule and deletes advisory language. In addition, this proposed change in the title of Table 6 clarifies that the setting depths are minimums and that the depths specified in the table also apply to non-wood poles.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be minimal. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revisions simplify GO 95 and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 18 – RULE 49.2A – CROSSARMS - MATERIAL

(1) Current Rule

49.2 Crossarms

A. Material

(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

(2) Strikeout/Redlined Proposed Changes

49.2 Crossarms

A. Material <u>(See Rule 48)</u>

~~**(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~~

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

(3) Proposed Final

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.

(4) History of Proposed Rule Change (PRC 15)

PRC 15 is unchanged from the Phase 3 Technical Panel Report.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED, this proposed change adds a reference back to Rule 48 and eliminates redundancy while retaining the requirement to use corrosion resistant materials for metal crossarms.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revisions simplify GO 95 and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 19 – RULE 49.2C – CROSSARMS - STRENGTH

(1) Current Rule

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.

(2) Strikeout/Redlined Proposed Changes

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 outer pin position shall be included in computing the vertical loads on all crossarms.

(3) Proposed Final

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 outer pin position shall be included in computing the vertical loads on all crossarms.

(4) History of Proposed Rule Change (*PRC 9*)

PRC 9 was a consensus rule change recommended by the Panel 1 Technical Committee. To address concerns by the parties, this associated rule change was then developed in the workshops by a technical workgroup.

(5) Consensus Rationale

Several rule changes were proposed to address the increased weight of workers and their equipment from 200 to 300 pounds. These changes are reflected in WR-PRCs 11, 19, 20, 23, 24, 26, and 27. These rule changes are consistent with the goal to revise GO 95 to reflect modern materials and practices and to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED.

WR-PRC 19 clarifies that, when computing the vertical load on all crossarms, the vertical load added to a crossarm shall be applied at the outer pin position.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other *objectives of the PRC.*

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be minimal. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revisions simplify GO 95 and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 20 – RULE 49.2E – CROSSARMS - GUARD ARM

(1) Current Rule

49.2 Crossarms

E. Guard Arm

Guard arms shall be made of wood or other suitable material not less than 48 inches in length and meeting the same insulating efficiency as Rule 22.8. Each guard arm and related pole attachments are required by Rule 46 to withstand vertical load of 200 pounds at either end.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

49.2 Crossarms

E. Guard Arm

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.

(4) History of Proposed Rule Change (*PRC 9 Associated change #2*)

PRC 9 was a consensus rule change recommended by the Panel 1 Technical Committee. To address concerns by the parties, this associated rule change was then developed in the workshops by a technical workgroup.

(5) Consensus Rationale

Several rule changes were proposed to address the increased weight of workers and their equipment from 200 to 300 pounds. These changes are reflected in WR-PRCs 11, 19, 20, 23, 24, 26, and 27. These rule changes are consistent with the goal to revise GO 95 to reflect modern

materials and practices and to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED.

WR-PRC 20 increases the load added to either end of a guard arm from 200 pounds to 300 pounds. This WR-PRC further clarifies that the vertical load added to a guard arm also applies to the support elements.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be minimal. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revisions simplify GO 95 and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 21 – RULE 49.4B – Table 8 – MINIMUM CONDUCTOR SIZES

(1) Current Rule

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 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" , Single Conductors *(d)*	-	*(e)*	-	-	*(e)*	14 BWG
Grade "F" , Paired Conductors *(d)*	-	14*(f)*			17*(g)*	-

(Notes to Table not shown)

(2) Strikeout/Redlined Proposed Changes

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 " ~~E~~C" , Single Conductors *(d)*	-	*(e)*	-	-	*(e)*	14 BWG
Grade " ~~E~~C" , Paired Conductors *(d)*	-	14*(f)*			17*(g)*	-

(No change to Table notes)

(3) Proposed Final

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)*	-

(No change to Table notes)

(4) History of Proposed Rule Change

As a follow-up to PRC-1 submitted in the Panel 1 Technical Report, Alternate Proposal (AP) 16 was developed during the workshops to address the removal of certain remaining references to

Grade "F" construction in other GO 95 sections and appendices. AP16, designated as PRC 26 for workshop tracking purposes, includes revisions to Rule 84.5 and Appendices C and D.

(5) Consensus Rationale

Consistent with the goal of "revising Section IV to reflect modern materials and practices", references throughout Section IV and other Sections of GO 95 to an obsolete Grade of Construction – Grade "F" – have been eliminated. These changes are also reflected in WR-PRC 7, WR-PRC 9, WR-PRC 16, WR-PRC 28, WR-PRC 29, WR-PRC 32, and WR-PRC 33. With the elimination of Grade "F", Grade "C" becomes the lowest Grade of Construction. These changes will require new facilities to be built to higher safety factors. This PRC removes references to Grade "F" construction.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

Modernizes GO 95 by removing an obsolete Grade of Construction from various rules and tables in Sections IV, V, VIII, and Appendices C and D.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record

and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 22 – RULE 49.4 C(5) – SAGS AND TENSIONS

(1) Current Rule

(5) Sags and Tensions: Conductor sags shall be such that under the loading conditions specified in Rule 43 the tension in the conductors shall not be more than one–half the breaking strength 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.

(2) Strikeout/Redlined Proposed Changes

(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.

(3) Proposed Final

(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.

(4) History of Proposed Rule Change

As a follow-up to PRC 16 submitted in the Panel 1 Technical Report, additional rule change proposals were developed during the workshops to address changes in worker and equipment related loads. Designated PRC 16 for workshop tracking purposes, the workshop version of this instant PRC included associated revisions to Rules 49.7B, 49.7C, 54.10E, and 54.10H.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable, as well as revising Section

IV to reflect modern materials and practices, this proposed rule change modernizes terminology, accounts for changes in worker and equipment related loads, and eliminates redundancy in the hardware material requirements.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC modernizes GO 95 by specifying that there are no minimum strength requirements for cable supported by messenger, and in associated changes, increases accountable weight allowances from 200 lbs. to 300 lbs. and 50 lbs. to 75 lbs. for loads that may be imposed by workers on cable chairs or ladders.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 23 – RULE 49.7B – STRENGTH

(1) Current Rule

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 pounds of vertical load for a man 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 or where the ice loading specified in Rule 43.1–B would exceed the allowance for the man and cable chair.

Strength of guys supporting messenger loads shall be such that the safety factor of such guys is not less than the safety factor 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.

(2) Strikeout/Redlined Proposed Changes

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.~~

(3) Proposed Final

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.

(4) History of Proposed Rule Change

This is one of the original proposals submitted as PRC 16 in the Panel 1 Technical Report. Additional rule change proposals were developed during the workshops to address changes in worker and equipment related loads. Designated PRC 16 for workshop tracking purposes, the workshop version of this instant PRC included associated revisions to Rules 49.4C, 49.7C, 54.10E, and 54.10H.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED, as well as revising Section IV to reflect modern materials and practices, this proposed rule change modernizes terminology, accounts for changes in worker and equipment related loads, and eliminates advisory information and redundancy in the hardware material requirements.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC modernizes GO 95 by increasing accountable weight allowances from 200 lbs. to 300 lbs. for loads that may be imposed by workers on cable chairs.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 24 – RULE 49.7C – SUPPORTS

(1) Current Rule

C. Supports

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

(2) Strikeout/Redlined Proposed Changes

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.~~

(3) Proposed Final

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.

(4) History of Proposed Rule Change

This is one of the original proposals submitted as PRC 16 in the Panel 1 Technical Report. Additional rule change proposals were developed during the workshops to address changes in worker and equipment related loads. Designated PRC 16 for workshop tracking purposes, the workshop version of this instant PRC included associated revisions to Rules 49.4C, 49.7B, 54.10E, and 54.10H.

(5) Consensus Rationale

Several rule changes were proposed to address the increased weight of workers and their equipment from 200 to 300 pounds. These changes are reflected in WR-PRCs 11, 19, 20, 23, 24, 26, and 27. These rule changes are consistent with the goal to revise GO 95 to reflect modern materials and practices and to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED. In addition, this proposed rule change modernizes terminology, and eliminates advisory information and redundancy in the hardware material requirements.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See s (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC modernizes GO 95 by increasing accountable weight allowances from 200 lbs. to 300 lbs. for loads that may be imposed by workers on cable chairs.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 25 – RULE 49.8 – HARDWARE

(1) Current Rule

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

(2) Strikeout/Redlined Proposed Changes

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

(3) Proposed Final

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

(4) History of Proposed Rule Change

This proposed rule change was submitted as PRC 17 in the Technical Panel 1 report.

(5) Consensus Rationale

This is an editorial change to correct a grammatical deficiency.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC corrects a grammatical deficiency.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies a GO 95 rule and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 26 – RULE 54.10E – CONDUCTOR MATERIAL AND STRENGTH

(1) Current Rule

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 of vertical load specified in Rule 49.7–B may be reduced to 50 pounds to allow for the load imposed by workers on ladders.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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.

(4) History of Proposed Rule Change

As a follow-up to PRC 16 submitted in the Panel 1 Technical Report, additional rule change proposals were developed during the workshops to address changes in worker and equipment

related loads. Designated PRC 16 for workshop tracking purposes, the workshop version of this instant PRC included associated revisions to Rules 49.4C, 49.7B, 49.7C, and 54.10H.

(5) Consensus Rationale

Several rule changes were proposed to address the increased weight of workers and their equipment from 200 to 300 pounds. These changes are reflected in WR-PRCs 11, 19, 20, 23, 24, 26, and 27. These rule changes are consistent with the goal to revise GO 95 to reflect modern materials and practices and to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED. In addition, this proposed rule change modernizes terminology, and eliminates advisory information and redundancy in the hardware material requirements.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See i (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC modernizes GO 95 by increasing proscribed weight allowances from 200 lbs. to 300 lbs. for loads that may be imposed by workers on cable chairs.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record

and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 27 – RULE 54.10H – FASTENINGS

(1) Current Rule

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 vertical load, specified in Rule 49.7–C may be reduced to 50 pounds to allow for the load imposed by workmen on ladders.

(2) Strikeout/Redlined Proposed Changes

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 workmen on ladders.

(3) Proposed Final

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 workmen on ladders..

(4) History of Proposed Rule Change

As a follow-up to PRC 16 (submitted in the Panel 1 Technical Report), additional rule change proposals were developed during the workshops to address changes in worker and equipment related loads. Designated PRC 16 for workshop tracking purposes, the workshop version of this instant PRC included associated revisions to Rules 49.4C, 49.7B, 49.7C, and 54.10E.

(5) Consensus Rationale

Several rule changes were proposed to address the increased weight of workers and their equipment from 200 to 300 pounds. These changes are reflected in WR-PRCs 11, 19, 20, 23, 24, 26, and 27. These rule changes are consistent with the goal to revise GO 95 to reflect modern materials and practices and to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED. In addition, this proposed rule change modernizes terminology and eliminates advisory information and redundancy in the hardware material requirements.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) *proposed revisions in strikeout/underline form, and (ii) the final proposed rule.*

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC modernizes GO 95 by increasing accountable weight allowances from 200 lbs. to 300 lbs. for loads that may be imposed by workers on cable chairs.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 28- RULE 81.3 – MATERIAL AND STRENGTH

(1) Current Rule

81.3 Material and Strength
Communication poles shall meet the material and strength requirements specified in Section IV.

A. Replacement of Wood Poles in Grade F Construction
Wood poles in Grade F 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

(2) Strikeout/Redlined Proposed Changes

81.3 Material and Strength
Communication poles shall meet the material and strength requirements specified in Section IV.

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

(3) Proposed Final

81.3 Material and Strength
Communication poles shall meet the material and strength requirements specified in Section IV.

A. 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

(4) History of Proposed Rule Change

This PRC was originally included as part of a consensus rule change (PRC 7) recommended by the technical committee. The PRC was then modified during the workshops to include additional changes recommended in PRC 22.

(5) Rationale

Consistent with the goal of "revising Section IV to reflect modern materials and practices", references throughout Section IV and other Sections of GO 95 to an obsolete Grade of Construction – Grade "F" – have been eliminated. See WR-PRCs 7, 9, 16, 28, 29, 32 and 33. With the elimination of Grade "F", Grade "C" becomes the lowest Grade of construction. These changes will require new facilities to be built to higher safety factors.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises GO 95 Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be minimal. With respect to any costs incurred, the rate-of-return regulated utilities may seek authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC poses no conflict with existing federal or state regulation.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 29 – RULE 84.5 – SAGS

(1) Current Rule

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.

(2) Strikeout/Redlined Proposed Changes

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.~~

(3) Proposed Final

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.

(4) History of Proposed Rule Change

As a follow-up to PRC-1 submitted in the Panel 1 Technical Report, Alternate Proposal (AP) 16 was developed during the workshops to address the removal of certain remaining references to Grade "F" construction in other GO 95 sections and appendices. AP16, designated as PRC 26 for workshop tracking purposes, includes revisions to 49.4-B (Table 8) and Appendices C and D.

(5) Consensus Rationale

Consistent with the goal of "revising [GO 95] Section IV to reflect modern materials and practices", the proposed change eliminates references throughout Section 4, other Sections and Appendices to an obsolete Grade of Construction – Grade "F". This PRC removes a reference to Table (25) which provides stringing sags for conductors in Grade F construction.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC modernizes GO 95 by removing an obsolete Grade of Construction from various rules and tables in Sections IV, V, VIII, and Appendices C and D.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and

will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 30 – RULE 101.2 – SPLICED OR STUB-REINFORCED POLES

(1) Current Rule

Spliced poles, stub–reinforced poles and pole top extension shall not be used in crossings or conflicts where Grade "A" construction is required.

(2) Strikeout/Redlined Proposed Changes

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

(3) Proposed Final

See 49.1 A (4)

(4) History of Proposed Rule Change

This proposed rule change was submitted as PRC 18 in the Technical Panel 1 report.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable, this proposed change corrects misalignment between Section X and XI rules and Section IV Rule 49.1 A(4). Rule 49.1 A(4) was revised in 2005, Decision No.0501030 to eliminate restrictions on the use of spliced or stubbed poles and pole top extensions in certain grades of construction.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC provides electric utilities and CIPs clear guidance for reliably meeting prescribed safety factors.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 31 – RULE 111.3 – SPLICED OR STUB-REINFORCED POLES

(1) Current Rule

Spliced or 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.

(2) Strikeout/Redlined Proposed Changes

~~Spliced or 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)

(3) Proposed Final

See 49.1 A (4)

(4) History of Proposed Rule Change

This proposed rule change was submitted as PRC 19 in the Technical Panel 1 report.

(5) Consensus Rationale

Consistent with the goal to provide electric utilities and CIPs clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable, this proposed change corrects misalignment between Section X and XI rules and Section IV Rule 49.1 A(4). Rule 49.1 A(4) was revised in 2005, Decision No.0501030 to eliminate restrictions on the use of spliced or stubbed poles and pole top extensions in certain grades of construction.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC provides electric utilities and CIPs clear guidance for reliably meeting prescribed safety factors.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 32 – APPENDIX C – CONDUCTOR SAGS AND TABLE 25

(1) Current Rule

To preserve space and for efficiency purposes, the original text of Appendix C is not included.

(2) Strikeout/Redlined Proposed Changes

(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----------	17,000,000
Steel and iron, solid----------	29.000,000
Steel, stranded----------	21,000,000
Copper–covered steel, solid----------	24,000,000
Copper–covered steel, stranded----------	23,000,000

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.~~

(c) Sags for unequal Spans, Level Supports and Normal Conditions

When a crossing span and its adjoining spans are of different lengths it is not possible to string the conductors so as to make both the normal tension and the loaded tension balance in the several spans. This condition should be met by selecting a sag for the longest span not less than that shown in the accompanying curves, charts 1 to 6, inclusive.

The sags for the other spans should then be determined as follows: For each span multiply the sag for the longest span by the square of the ratio of the length of the span under consideration to that of the longest span. The total normal tension in each of the spans will then balance and the total tension under loaded conditions will be slightly less in the short spans than in the longest span.

Example

Assume -

A crossing span length of 250 feet-Heavy Loading District. Adjoining spans of 300 feet and 200 feet, respectively. Conductors No. 0 AWG copper, medium–hard– drawn, stranded, bare. Sag from curve on chart 4, for a 300–foot span is 5.30 feet.

Making the sags in the other spans proportional to the squares of their length, the sag in the 250 foot span will be,

$$\frac{250^2}{300^2} \times 5.30 = 3.68 \text{ Feet}$$

The sag in the 200–foot span will be,

$$\frac{200^2}{300^2} \times 5.30 = 2.36 \text{ Feet}$$

(d) Sag Correction for Temperature

The curves, on chart 7 cover the correction of sags for stringing temperatures other than that for

which the sag curves were calculated. These figures cover the normal range of stringing conditions for temperatures at time of stringing, varying between 0 degrees F. and 130 degrees F. and for spans of from 100 feet to 1,000 feet, inclusive, in 100–foot steps, with the exception that the 150–foot span has also been included. They represent average values for each degree F. difference between actual stringing temperature and the temperature for which the curves were calculated, that is 60 degrees F. The corrections for temperatures greater than 60 degrees F. are to be added to the normal sags while the corrections for temperatures less than 60 degrees F. are to be subtracted. The correction for a given difference of temperature from the base value is considered the same whether the stringing temperature is greater or less than the base value.

The use of these corrections may be illustrated by assuming a specific case:

Example

Assume -

A span of 300 feet - Heavy Loading District. Conductors No. 0 AWG copper, medium–hard–drawn, stranded, bare.

Stringing temperature 80 degrees F.

Minimum normal sag, chart 4, is 5.30 feet.

Difference between stringing temperature and normal temperature is 20 degrees F.

The ratio for sag divided by span is 0.0177. From the curve on chart 7, the correction per degree F. for this ratio for a span of 300 feet is 0.024 feet.

The total correction for 20 degrees F. difference is, 20 x 0.024 = 0.48 feet

(e) Sags for Supports at Different Elevations

The sag curves have been based on the supports being at the same elevation. The curve on chart 8 covers the correction of the sag to care for the difference of elevation of supports.

The use of this correction may best be illustrated by taking a concrete case:

Example

Assume - A span of 300 feet - Heavy Loading District.

A difference in level of supports of 5 feet.

Conductors No. 0 AWG copper, medium–hard–drawn, stranded bare.

The curve, on chart 4, requires a sag of 5.30 feet.

The ratio of difference in level of supports divided by the sag is 5.0 divided by 5.30 which equals 0.94 and is the ratio marked h/S on curve, chart 8. The multiplier C for this ratio is 0.58.

Therefore the sag below the lower point of support is,

If the sag is to be measured from the higher support, the sag below the lower support may be obtained as above and the difference in elevation of supports added thereto, which gives the sag below the higher support as 3.07 + 5.00 which equals 8.07 feet. The difference of levels may be such that the resultant pull is upward at the lower support; that is, the lowest point in the span is at the support. To cover this condition, and also as an alternative method of solving cases like that just considered, use may be made of the following approximate rule which is sufficiently accurate for all ordinary situations "The apparent sag, or the vertical distance between a straight line joining supports and the tangent to the span, parallel thereto, equals the sag for a normal span of the same length."

(f) Determination of Amount of Sag for Various Points in a Span

The sag curves on charts 1 to 6, inclusive, show for wires of different sizes and materials the value of the center sag at which these wires should be strung under normal conditions to have the assumed factors of safety under the designated load conditions. At times it is desirable to know, not only the amount of sag at the center of the span, but also the amount of sag at some other point in the span.

This is necessary, for example, in obtaining the clearance over other wires where the point of crossing between the crossing span and the wires crossed occurs, not at the center of the crossing span, but at some other point.

On chart 9 a curve is given by means of which, given the amount of center sag, the amount of the sag at any other point in the span can be determined. This curve gives the value of the sag at all points on the catenary curve expressed in per cent of the center sag. The use of this curve is shown by the following example:

Example

Assume - A span of 300 feet-Heavy Loading District.

A center sag, determined from the sag curves, of 5.30 feet.

The crossing span crosses over a Class C line, on which the top wire at the point of this crossing has an elevation of 25 feet.

This point of crossing to be 105 feet from the nearest support of the crossing conductor, and a minimum vertical clearance of 6 feet is required at the point of crossing.

Required - At what height must the crossing conductor be supported in order that this required vertical clearance shall be obtained?

As the span length is 300 feet, and the distance from the nearest support to the point of crossing is 105 feet, this distance is 35% of the span length. From the curve, on chart 9, the value of the sag at this point is 91 per cent of the center sag. The sag at this point, therefore, equals 5.30 x 0.91 = 4.82 feet.

Therefore, the required elevation of the crossing conductor at its point of support is equal to the height of the Class C wires crossed (25 feet), plus the minimum vertical clearance required (6 feet), plus the sag of the conductor at the point of crossing (4.82 feet), or

25 feet + 6 feet + 4.82 feet = 35.82 feet

(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 Hard Drawn*
2	*Conductor Sags, Light Loading, Weatherproof Copper Hard Drawn and Medium Hard Drawn*
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*
Table	*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 MMMM DD, YYYY by Decision No. YYMM###

~~**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.

(3) Proposed Final

(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----------	17,000,000
Steel and iron, solid----------	29.000,000
Steel, stranded----------	21,000,000
Copper–covered steel, solid----------	24,000,000
Copper–covered steel, stranded----------	23,000,000

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.

(c) Sags for unequal Spans, Level Supports and Normal Conditions

When a crossing span and its adjoining spans are of different lengths it is not possible to string the conductors so as to make both the normal tension and the loaded tension balance in the several spans. This condition should be met by selecting a sag for the longest span not less than that shown in the accompanying curves, charts 1 to 6 , inclusive.

The sags for the other spans should then be determined as follows: For each span multiply the sag for the longest span by the square of the ratio of the length of the span under consideration to that of the longest span. The total normal tension in each of the spans will then balance and the total tension under loaded conditions will be slightly less in the short spans than in the longest span.

Example

Assume -

A crossing span length of 250 feet-Heavy Loading District. Adjoining spans of 300 feet and 200 feet, respectively. Conductors No. 0 AWG copper, medium–hard– drawn, stranded, bare. Sag from curve on chart 4 , for a 300–foot span is 5.30 feet.

Making the sags in the other spans proportional to the squares of their length, the sag in the 250 foot span will be,

$$\frac{250^2}{300^2} \times 5.30 = 3.68 \text{ Feet}$$

The sag in the 200–foot span will be,

$$\frac{200^2}{300^2} \times 5.30 = 2.36 \text{ Feet}$$

(d) Sag Correction for Temperature

The curves, on chart 7 cover the correction of sags for stringing temperatures other than that for which the sag curves were calculated. These figures cover the normal range of stringing conditions for temperatures at time of stringing, varying between 0 degrees F. and 130 degrees F. and for spans of from 100 feet to 1,000 feet, inclusive, in 100–foot steps, with the exception that the 150–foot span has also been included. They represent average values for each degree F. difference between actual stringing temperature and the temperature for which the curves were calculated, that is 60 degrees F. The corrections for temperatures greater than 60 degrees F. are to be added to the normal sags while the corrections for temperatures less than 60 degrees F. are to be subtracted. The correction for a given difference of temperature from the base value is considered the same whether the stringing temperature is greater or less than the base value.

The use of these corrections may be illustrated by assuming a specific case:

Example

Assume -

A span of 300 feet - Heavy Loading District. Conductors No. 0 AWG copper, medium–hard–drawn, stranded, bare.

Stringing temperature 80 degrees F.

Minimum normal sag, chart 4 , is 5.30 feet.

Difference between stringing temperature and normal temperature is 20 degrees F.

The ratio for sag divided by span is 0.0177. From the curve on chart 7 , the correction per degree F. for this ratio for a span of 300 feet is 0.024 feet.

The total correction for 20 degrees F. difference is, 20 x 0.024 = 0.48 feet

(e) Sags for Supports at Different Elevations

The sag curves have been based on the supports being at the same elevation. The curve on chart 8 covers the correction of the sag to care for the difference of elevation of supports.

The use of this correction may best be illustrated by taking a concrete case:

Example

Assume - A span of 300 feet - Heavy Loading District.

A difference in level of supports of 5 feet.

Conductors No. 0 AWG copper, medium–hard–drawn, stranded bare.

The curve, on chart 4 , requires a sag of 5.30 feet.

The ratio of difference in level of supports divided by the sag is 5.0 divided by 5.30 which equals 0.94 and is the ratio marked h/S on curve, chart 8 . The multiplier C for this ratio is 0.58. Therefore the sag below the lower point of support is,

If the sag is to be measured from the higher support, the sag below the lower support may be obtained as above and the difference in elevation of supports added thereto, which gives the sag below the higher support as 3.07 + 5.00 which equals 8.07 feet. The difference of levels may be such that the resultant pull is upward at the lower support; that is, the lowest point in the span is at the support. To cover this condition, and also as an alternative method of solving cases like that just considered, use may be made of the following approximate rule which is sufficiently accurate for all ordinary situations “The apparent sag, or the vertical distance between a straight line joining supports and the tangent to the span, parallel thereto, equals the sag for a normal span of the same length.”

(f) Determination of Amount of Sag for Various Points in a Span

The sag curves on charts 1 to 6 , inclusive, show for wires of different sizes and materials the value of the center sag at which these wires should be strung under normal conditions to have the assumed factors of safety under the designated load conditions. At times it is desirable to know, not only the amount of sag at the center of the span, but also the amount of sag at some other point in the span.

This is necessary, for example, in obtaining the clearance over other wires where the point of crossing between the crossing span and the wires crossed occurs, not at the center of the crossing span, but at some other point.

On chart 9 a curve is given by means of which, given the amount of center sag, the amount of the sag at any other point in the span can be determined. This curve gives the value of the sag at all points on the catenary curve expressed in per cent of the center sag. The use of this curve is shown by the following example:

Example

Assume - A span of 300 feet-Heavy Loading District.

A center sag, determined from the sag curves, of 5.30 feet.

The crossing span crosses over a Class C line, on which the top wire at the point of this crossing has an elevation of 25 feet.

This point of crossing to be 105 feet from the nearest support of the crossing conductor, and a minimum vertical clearance of 6 feet is required at the point of crossing.

Required - At what height must the crossing conductor be supported in order that this required vertical clearance shall be obtained?

As the span length is 300 feet, and the distance from the nearest support to the point of crossing is 105 feet, this distance is 35% of the span length. From the curve, on chart 9 , the value of the sag at this point is 91 per cent of the center sag. The sag at this point, therefore, equals 5.30 x 0.91 = 4.82 feet.

Therefore, the required elevation of the crossing conductor at its point of support is equal to the height of the Class C wires crossed (25 feet), plus the minimum vertical clearance required (6 feet), plus the sag of the conductor at the point of crossing (4.82 feet), or

25 feet + 6 feet + 4.82 feet = 35.82 feet

(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 Drawn
2	Conductor Sags, Light Loading, Weatherproof Copper Hard Drawn and Medium Hard Drawn
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

Table 25: Deleted MMMM DD, YYYY by Decision No. YYMM###

(4) History of Proposed Rule Change

As a follow-up to PRC-1 (submitted in the Panel 1 Technical Report), AP 16 was developed during the workshops to address the removal of certain remaining references to Grade "F" construction in other GO 95 sections and appendices. AP16, designated as PRC 26 for workshop tracking purposes, includes revisions to 49.4-B (Table 8), Rule 84.5 and Appendix D.

(5) Consensus Rationale

Consistent with the goal of "revising [GO 95] Section IV to reflect modern materials and practices", the proposed change eliminates references throughout Section 4, other Sections and Appendices to an obsolete Grade of Construction – Grade "F". This PRC removes Table 25 and references to Grade "F" construction.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC modernizes GO 95 by removing an obsolete Grade of Construction, typically applied to "open-wire" communication lines, from various rules and tables in Sections IV, V, VIII, and Appendices C and D.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

WR-PRC 33 – APPENDIX D – TYPICAL COMMUNICATION LINE CONSTRUCTION

(1) Current Rule

To preserve space and for efficiency purposes, the original text of Appendix D is not included.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

Appendix D

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Size and material dependent upon the class of circuit involved. The average span length is 150 feet.

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

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As a follow-up to PRC-1 submitted in the Panel 1 Technical Report, AP 16 was developed during the workshops to address the removal of certain remaining references to Grade "F" construction in other GO 95 sections and appendices. AP16, designated as PRC 26 for workshop tracking purposes, includes revisions to 49.4-B (Table 8), Rule 84.5 and Appendix C.

(5) Consensus Rationale

Consistent with the goal of "revising [GO 95] Section IV to reflect modern materials and practices", the proposed change eliminates references throughout Section 4, other Sections and Appendices to an obsolete Grade of Construction – Grade "F". This PRC removes a reference to Table (25) which provides stringing sags for conductors in Grade F construction.

(6) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO (s), if any.

See (1) above.

- New and/or revised text for the affected GO (s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This PRC revises Section IV to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

This PRC modernizes GO 95 by removing an obsolete Grade of Construction from various rules and tables in Sections IV, V, VIII, and Appendices C and D.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity. .

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

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APPENDIX B – MULTIPLE ALTERNATIVE PROPOSALS

MAP #	GO 9y5 Rule	Rule Title	Proponent	Original Proposal Number	Page No.
MAP 1	Rule 12.1E/ Rule 44.5	Addition of Facilities (new) - Change in Grade (new)	CIP Coalition	AP 15	B-2
MAP 2	Rule 31.7	Hazards to Aviation (new)	Hans Laetz	AP 14	B-10
MAP 3A	Rule 44.2	Additional Construction	SED	AP 3A	B-17
MAP 3B	Rule 44.2	Additional Construction	Hans Laetz	AP 3B	B-22
MAP 4	Rule 46	Vertical Strength Requirements	Hans Laetz	AP 5	B-31
MAP 5A	Rule 48	Ultimate Strength of Materials	CIP	AP 6A	B-39
MAP 5B	Rule 48	Ultimate Strength of Materials	SDG&E	AP 6B	B-47
MAP 5C	Rule 48	Ultimate Strength of Materials	SED	AP 6C	B-56
MAP 6A	Rule 48.1	Wood	SDG&E	AP 7A	B-62
MAP 6B	Rule 48.1	Wood	SED	AP 7B	B-71
MAP 7A	Rule 48.2	Steel	SDG&E	AP 8A	B-80
MAP 7B	Rule 48.2	Steel	SED	AP 8B	B-89
MAP 8A	Rule 48.4	Fiber-Reinforced Polymer (new)	CIP Coalition	AP 9A	B-98
MAP 8B	Rule 48.4	Fiber-Reinforced Polymer (new)	SED	AP 9B	B-103
MAP 9A	Rule 48.5	Other Engineered Materials (Currently Rule 48.4 Other Structural Materials)	SDG&E	AP 10A	B-109
MAP 9B	Rule 48.5	Other Engineered Materials (Currently Rule 48.4 Other Structural Materials)	SED	AP 10B	B-115

MAP 1 – RULE 12.1 – ADDITION OF FACILITIES AND RULE 44.5 - CHANGE IN GRADE

Rules 12.1/ 44.5 Proposal by CIP Coalition

(1) Current Rule (12.1)

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)

No current subpart E.]

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

12.1 Construction and Reconstruction of Lines

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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.

(4) Current Rule (44.5)

No current rule.

(5) Strikeout/Redlined Proposed Changes

<u>44.5 Change of Grade</u>

<u>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.</u>

(6) Proposed Final

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.

(7) Rationale

MAP 1 (formerly AP 15) proposes to add language to existing Rule 12.1 to (a) clarify the applicability of Rules 44.1 and 44.3 concerning the addition of facilities to poles that result in a change of grade, and (b) to address concerns that have resulted from certain interpretations of previous changes to Rule 23. The proposed language in Rule 12.1 clarifies that the addition of facilities that change the grade of the pole shall not constitute "reconstruction" provided that: 1) the addition of facilities does not reduce the safety factor of the pole below that specified in Rule 44.3; and, for wood poles, 2) either the pole in question is less than 15 years old or an intrusive pole test has been performed in the last five years and the results are available for and used in the pole loading calculations. This proposed change is consistent with the goal to provide electric utilities and CIPs with clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED. In addition, this change promotes the efficient use of electric and communication infrastructure by not requiring premature replacement of poles which otherwise satisfy the applicable safety factors in the GO.

In Phase 2 of this proceeding, certain language was added to Rule 23 for the perceived purpose of "clarifying" that a change in grade of construction or class of a pole constitutes reconstruction, consistent with SED's intention. Because this rule change was characterized as a clarification, it was not anticipated to significantly impact CIPs' ability to add facilities to existing Grade B (i.e., electric-only) poles. However, since the changes to Rule 23 were adopted in Phase 2, CIPs seeking to add facilities to Grade B wood poles have experienced unreasonable delays, rejections and, in some cases, have been required to replace a number of those poles even where the existing poles could have supported the attachment consistent with the 2.67 safety factor in Rule 44.3 associated with Grade A (i.e., joint use) poles. Prior to the adoption of revised Rule 23, the general practice was to allow for such attachments to Grade B poles provided that the 2.67 safety factor was met.

The change to Rule 23 has also resulted in an unjustified disparity in the safety factors that electric utilities and CIPs are required to meet when adding facilities to a pole. For example, IOUs are allowed to apply 2/3 of the safety factor for the installation of additional electric facilities to a Grade B wood pole that is required to meet a safety factor of 3.0 at installation, deferring replacement of such poles until the safety factor reaches 2.0. However under the current rules as some electric utilities have interpreted them, *the first CIP* to add facilities to that same Grade B pole must bring up the safety factor of that pole to 4.0, which could require a replacement of the pole at the expense of the first attaching CIP. Conversely, another CIP or an electric utility can subsequently add facilities to that same pole at a safety factor of 2.67 without any additional cost. This MAP attempts to address these disparities.

The CIP Coalition has proposed the exception to Rule 12.1 to provide greater equity so that the addition of CIP facilities to a Grade B pole - or the addition of facilities by any party to a pole that results in a change of grade - triggers pole replacement *only* where the safety factors for the new higher grade of pole cannot be met. In addition, in order to address concerns raised by SED and others about the need to account for possible degradation of wood poles over time, the CIP

Coalition has added requirements to MAP 1 to ensure any degradation found at the time of installation and that occurs subsequently is taken into account. In this regard Rule 12.1 E ensures that the pole to which facilities are being added is relatively new or that there are recent intrusive pole testing results that are used in determining the safety factor at the time of installation. Rule 44.5 requires that loading calculations be performed on a prospective basis at the time of every subsequent intrusive test. The CIP Coalition believes that these additional rule changes resolve SED's concerns in a reasonable manner, meet the Commission's goal of providing electric utilities and CIPs with clear guidance for reliably obtaining prescribed safety factors and standards, and treats electric utilities and CIPs equally with respect to pole attachments. This rule change also avoids the unnecessary cost and delay associated with certain parties' interpretations of the Phase 2 change to Rule 23.

(8) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This proposed change is consistent with the goal to provide electric utilities and CIPs with clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This proposed change is consistent with the goal to provide electric utilities and CIPs with clear guidance for reliably obtaining prescribed safety factors and standards that are enforceable by SED. By doing such it will aid in ensuring consistency in compliance which in turn will enhance the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facility will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Rule 12.1(e) should result in costs savings since it will avoid the premature replacement of poles. The costs to implement Rule 44.5 are unknown; however the CIP coalition asserts that implementation costs will be limited to the subset of poles with an increase in grade after the effective date of this rule.

- Whether and how the costs will be recovered from customers.

With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Whether and if so how the costs will be shared among individual electric utilities and CIPs will depend on parties' ownership interests in the poles and the relevant terms in the applicable joint pole agreements or pole license agreements.

- Why it is in the public interest to adopt the PRC.

See Rationale. This PRC will modify GO 95 to allow electric utilities and CIPs to attach to poles more effectively and efficiently while maintaining the safety standards needed to protect Californians.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(9) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

CMUA, LADWP, MID and SMUD

CMUA, LADWP, MID and SMUD oppose this proposal because of the proposed new Rule 44.5. Rule 44.2 requires that a pole loading calculation be performed in most cases when additional facilities are added to a pole. Rule 23.3 classifies a change in grade of construction or class of circuit as reconstruction. Rule 44.1 states the pole must meet Table 4 strength requirements.

A pole loading calculation is required when the communication facility was attached due to the change in grade of construction, and would be maintained for 10 years. Therefore, there is no need to perform another pole loading calculation at the time of an intrusive inspection after a change in grade of construction unless warranted by the intrusive inspection results. It would be operationally difficult to track which poles had a change in the grade of construction. The calculations would be an additional, unnecessary cost.

Joint Utilities

The Joint Utilities (PG&E, SCE, SDG&E, PacifiCorp, CalPeco, BVES) oppose the adoption of proposed new rules 12.1-E and 44.5 because they are both unnecessary and are not based on any legitimate safety need; in fact they seem to be contrary to the goals of the Scoping Memo, which goals are to reduce fire hazards associated with overhead utility facilities and to enhance safety in California.

In Phase 2 of this Rulemaking, the Commission added to GO 95, Rule 23 (Reconstruction) a sentence that reads: "A change in grade of construction or class of circuit is considered reconstruction". This was a consensus rule change, agreed to by the CIP Coalition, the Joint Utilities, and SED, and had the effect of applying safety factors for new construction to a change in grade or class. This change was understood (by all) to mean that when a communications facility is added to an electric only pole, (which is the case with Grade B construction shown in GO 95, Rule 42, Table 3), the rule requires the subject pole be brought up to new construction safety factors – a rule change that was designed to promote public safety.

Proposed new rule 12.1-E attempts to rescind this revision to Rule 23. Although the proponent's rationale asserts that the proposed new rules 12.1-E and 44.5 will lead to "[m]ore reliable facilities" and "reduce the risk that the facility will create a fire hazard," the proposed new rules may well have the opposite effect. The proposed new rules will increase stresses on poles, reduce the safety factors currently required for a change in grade or class, and will also reduce the number of poles replaced. This result is contrary to the stated goals of this Rulemaking.

Proposed new rule 44.5 (indelibly linked to proposed new rule 12.1-E and also unnecessary) was crafted by the CIP Coalition solely for the purpose of garnering Safety and Enforcement Division's (SED) support for 12.1-E. The proponents have not demonstrated any evidence of need and ignore the negative consequences of implementing this proposed rule. The adoption of proposed rule 44.5 will require an extensive, expensive, and unnecessary revision or creation of

programs to track and monitor new joint-use poles and sole-use poles where a change in construction grade has occurred. It would then be necessary to integrate these new or revised programs with existing wood pole intrusive testing programs. Implementation of a new testing regimen will not enhance safety or reliability of overhead structures and the existing cost efficiencies delivered with the current intrusive testing programs would be undermined.

Because the proponents have not demonstrated any need for this change or demonstrated how this proposed change could deliver improved safety provisions, and because the financial impacts have not been duly considered, both proposed rules 12.1-E and 44.5 should be rejected.

Hans Laetz

The CIP Coalition's proposal would completely gut vital, fundamental protections given Californians by one of the most-important foundations of GO95. It does not "clarify" or correct any unclear safety changes recently made by the Commission, as stated. It would simply reverse those changes. The existing Rule 12.1, Rule 23 and Rule 44.5 are well-considered and quite clear in their meaning, and this combo does not need to be weakened in the name of correcting a supposed lack of clarity. Californians for decades have been protected by GO95 rules that simply require a 4.0 safety factor for new Grade A construction or reconstruction. The day that the installation crews roll away, that 4.0 sf is then allowed to immediately drop by one third, to a 2.67 sf, to allow for deterioration or addition of equipment.

Here, CIPs seek to add facilities to Grade B poles, which are originally built to a 3.0 sf new construction/reconstruction standard. CIP seeks to evade the 4.0 and 2.67 sf standard, so long as the finished reconstructed facility exceeds the 2.67 standard. This means the significant margin of error afforded new construction -- one third of its capacity -- would evaporate. No new equipment installation or deterioration can be accommodated at the reconstructed pole by the original owner, usually an Investor Owned Utility funded by ratepayers. The burden of replacing the pole is thus shifted from the CIP to the IOU and other joint pole owners. Worse, the amount of deterioration and allowance for additional equipment drops from one third of 4.0 to zero thirds of 2.67.

The CIPs also complain that the Rule 23 change resulted in "unjustified disparity" between them and IOUs when equipment is added to Grade B poles. If there is a problem with Grade B poles being overloaded by the addition of equipment by IOUs, that is a problem that should be addressed -- but not by allowing CIPs to overload Grade B poles in the interest of parity. GO 95 is not a tool for communications companies to exploit the same regulatory weaknesses exploited by IOUs, if that is really a problem.

The CIPs state their proposed exception to Rule 12.1 is to provide "greater equity" by lowering the standards for CIPS, instead of raising them for IOUs. GO 95 is a set of safety rules, first and foremost. The people of California should not see important safety rules relaxed to meet complaints of "that's not fair."

(10) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T	X			
BVES			X	
CAL-FIRE				X
CALPECO			X	
CCTA		X		
CMUA			X	
COMCAST		X		
COX		X		
SED (CPSD)	X			
CROWN CASTLE	X			
CTIA	X			
DRA				X
EXTENET		X		
FRONTIER				X
H. Laetz		X		
IBEW 1245				X
LA COUNTY				X
LADWP			X	
MGRA				X
MID			X	
PACIFICORP			X	
PG&E			X	
SCE			X	
SDG&E			X	
SMALL LECS	X			
SMUD			X	
SPRINT NEXTEL	X			
SUNESYS	X			
SUREWEST	X			
TW CABLE		X		
T-MOBILE	X			
TURN				X
TW TELECOM		X		
VERIZON	X			

MAP 2 – RULE 31.7 – HAZARDS TO AVIATION

Rule 31.7 Proposal by Hans Laetz

(1) Current Rule

No Current Rule

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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.

(4) Rationale

Areas with high fire-risk are concentrated in mountainous regions of California. These areas are frequently marked by deep canyons, and electrical transmission lines sometimes cross these canyons at great height above surface level (ASL). In many cases, these high-span lines are marked with observation balls to alert aviators. In many other cases, these high-span lines are not marked.

There are no state laws or rules requiring such markings. The FAA only recommends such warnings at heights less than 200 feet ASL, while lines above 200 feet ASL must be marked per the federal regulation mentioned in the rule. Some utilities mark newer transmission line high-span lines, while not retroactively marking older spans. Other utilities have aggressively marked their high spans, or relocated some lines to lessen the hazard.

Aviators and the general public are placed at great risk due to the varying policies between utilities, and even within utilities, and the obvious danger that these lines present. In the October 2007 fires, firefighting aerial bombardment operations in the Malibu area were called off due to the pilots' inability to see high-span lines. The fire-prone canyons of the Santa Monica Mountains near petitioner Laetz's house are frequently transited by medical rescue helicopters for beach rescues, and are laced with high-span lines.

Fires are a reasonable and obvious consequence of aircraft crashes into high-span lines. And although the federal government regulates the nation's airspace, marking power lines attached to the ground would be a state police action and land use regulatory endeavor, not preempted by federal regulation or possible Dormant Commerce Clause issues.

These dangers extend beyond High Fire-Risk Districts, and there can be no possible rationale for failing to extend these regulations statewide. On Jan. 5, 2010, a helicopter chartered by the California Department of Fish and Game engaged in a wildlife survey in the Sierra Nevada in Madera County crashed into Southern California Edison high-span lines, killing Clu Cotter, 48, Kevin O'Connor, 40, Tom Stolberg, 31, and the pilot, Dennis Donovan, 70, according to news reports. The Associated Press reported that the utility issued this statement when asked if the high-span lines were marked: "The company had not marked those power lines because no one had ever asked them to do so."

In this Rulemaking, the Commission ordered affected companies to revise Section IV of GO 95 "to reflect modern materials and practices, with the goal of improving fire safety." There can be no question that adopting federal aviation safety suggestions as California rules will modernize GO 95 by introducing the concept of modern aviation into regulations dating from 1922. Aviators and the people who live near high-span lines, in areas of high fire risk, deserve to be protected from aviation or fire disaster caused by lines that are unmarked because they are in likely emergency flight paths but less than 199 feet above a canyon floor, instead of 201 feet.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

It is reasonably believed that some CIPs and POUs will be affected less than others. Discussions with utility engineers and aviators indicate that some utilities, notably SDG&E, have already embarked on aggressive moves to mark all high-span lines, or even relocate their lines from chasms. Other utilities, such as SCE, are marking new transmission lines that cross chasms at high levels, but apparently not existing lines. Ascertaining the number of affected chasms, and the various companies' policies towards marking such lines, the expense of the safety and cost recovery measures are obvious, significant and acknowledged issues that must be determined in this Rulemaking proceeding.

- The current text of the affected GO(s), if any.

Not applicable.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

Not applicable.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

The stated 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. The presence of unmarked high-span lines in fire-risk districts presents both an obvious and historically-validated risk for causing fires and impediment to aerial firefighting efforts. Marking high-span lines will lessen future wildfire sources and make fighting fires safer for crews, and make aerial firefighting a better tool in the arsenal of the firefighters protecting property and lives.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

As stated in the Rationale, it is reasonably believed that marking high-span lines in canyons would decrease the eventuality of aviation crashes, which themselves often cause fires. Marking such lines would also ease the burden of firefighting aircraft and allow them to operate closer to marked power lines. Aerial firefighting or lifesaving operations can be better conducted in degraded visual conditions if lines above 100 feet ASL were to be marked. And non-fire, emergency aerial operations, such as medevac or newsgathering flights, can be more-safely conducted if high-span lines were marked down to 100 feet ASL.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Unknown. The costs are not expected to be insignificant, and should be marked to the miscellaneous "memo: category for the next general rule case.

- Whether and how the costs will be recovered from customers.

Unknown. The costs are not expected to be insignificant, and should be marked to the miscellaneous "memo" category for the next general rule case.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

The costs are not expected to be insignificant, and should be marked to the miscellaneous "memo" category for the next general rule case.

- Why it is in the public interest to adopt the PRC.

California's overhead structure rules do not address aviation warnings for structures or wires at all, and federal regulations do not address structures or wires below 200 feet ASL. This deadly gap has caused fatal aviation crashes in past years and can reasonably be expected to do so in the future. Further, Californians are placed at risk of fires ignited by crashes caused by unmarked high-span lines, a risk that is compounded by the risks to, and operational limitations placed upon, aerial firefighters by such unmarked lines. Enacting this Rule would make California mountains safer, a clear benefit that cannot be expressed in cost-benefit ratios.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC extends existing GO 95 rules, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

CIP Coalition

The CIP Coalition maintains its opposition to this proposed rule which, in short, would require structures over 100 feet in height or any structures over 50 feet in height that have cables that cross roads to add marking or lights in accordance with Federal Aviation Administration ("FAA") regulation. The FAA, however, does not require such markings under the parameters set forth in the proposed new rule. As a result this rule would create an additional requirement in California for poles and towers over these heights which would intrude in the FAA's sphere of jurisdiction.

The proponent of the rule argues for the rules adoption as "[f]ires are a reasonable and obvious consequence of aircraft crashes into high-span lines," and thus the proposed rule "should be adopted as consistent with the goal of the proceeding of improving fire safety." The proponent continues by stating that "although the federal government regulates the nation's airspace, marking power lines attached to the ground would be a state police action and land use regulatory endeavor, not preempted by federal regulation or possible Dormant Commerce Clause issues." While the CIP Coalition does not question the fire safety element inherent in the marking and lighting of certain transmission /distribution infrastructure, the fact is that state actions, such as the one proposed in MAP 2, are federally preempted.[1] The FAA has established

[1] *Abdullah v. American Airlines*181 F.3d 363 (3rd Cir. 1999) at pp. 367-368 (Our finding of implied field preemption here is based on our conclusion that the FAA and relevant federal regulations establish complete and thorough safety standards for interstate and international air transportation that are not subject to supplementation by, or variation among, jurisdictions. While some courts have found federal law to preempt discrete aspects of air

a process to evaluate the impact of the proposed construction or alteration on safety in air commerce and the efficient use and preservation of the navigable airspace and determine appropriate marking and lighting recommendations.[2] The FAA's jurisdiction over tower lighting and marker balls on spans has been recognized by the Commission.[3]

Finally, the MAP, by requiring that the proposed marking and lighting be effected for existing structures, as opposed to new construction or reconstruction, is inconsistent with Rule 12.1 of GO. Rule 12.1 explicitly provides that the rules "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." MAP 2 does not acknowledge the limitations of Rule 12.1.

Joint Utilities

The Joint Utilities (PG&E, SCE, SDG&E, PacifiCorp, CalPeco, BVES) oppose the adoption of proposed new rule 31.7 because it is not in scope, is wholly impractical, and improperly attempts to usurp the jurisdiction of the Federal Aviation Administration (FAA).

The marking and/or lighting of utility infrastructure located in or near navigable airspace is already addressed by Part 77 of Title 14 of the Code of Federal Regulations and as described further in corresponding Advisory Circulars. The State of California Department of Transportation's Division of Aeronautics readily acknowledges the FAA's authority over air space which includes the marking and/or lighting of utility infrastructure. (See link below.) http://www.dot.ca.gov/hq/planning/aeronaut/FedCaAviationRole.html

Further, requiring additional marking and/or lighting for structures and lines categorically excluded by FAA regulations will increase design and construction costs significantly and may create significant California Environmental Quality Act (CEQA) impacts due to aesthetics.

This proposal should be rejected because (1) the State of California recognizes the FAA's jurisdictional authority over navigable airspace; (2) because no evidence of need has been presented, and (3) subsequent design, construction and maintenance costs could increase dramatically.

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safety [cites omitted] we hold that federal law establishes the applicable standards of care in the field of air safety, generally, thus preempting the entire field from state and territorial regulation.")

[2] See 14 CFR § 77.5.

[3] *See, e.g.*, Decision 12-11-026 (Commission granted a petition for modification of Decision 07-01-040 regarding the Devers Palo Verde No. 2 Transmission Project as necessary to comply with recommendations of the FAA involving the marking of certain transmission line spans with marker balls and the installation of lights of certain transmission structures).

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T			X	
BVES			X	
CAL-FIRE				X
CALPECO			X	
CCTA			X	
CMUA			X	
COMCAST			X	
COX		X		
SED (CPSD)			X	
CROWN CASTLE			X	
CTIA			X	
DRA				X
EXTENET			X	
FRONTIER				X
H. Laetz	X			
IBEW 1245				X
LA COUNTY				X
LADWP			X	
MGRA				X
MID			X	
PACIFICORP			X	
PG&E			X	
SCE			X	
SDG&E			X	
SMALL LECS			X	
SMUD			X	
SPRINT NEXTEL			X	
SUNESYS			X	
SUREWEST			X	
TW CABLE			X	
T-MOBILE			X	
TURN				X
TW TELECOM			X	
VERIZON			X	

MAP 3A – RULE 44.2 – ADDITIONAL CONSTRUCTION

Rule 44.2 Proposal by SED

(1) Current Rule

44.2 Additional Construction

Any entity planning the addition of facilities that materially increase vertical, transverse or longitudinal loading 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.

Note: For the purpose of Rule 44.2, a material increase in load is an addition which 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.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

44.2 Additional Construction

Any entity planning the addition of facilities that materially increase 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 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 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.

(4) Rationale

Rule 44.3 sets forth the criteria for when lines or parts of lines need to be replaced or reinforced. This criterion is predicated on a single calculation, a loading calculation, which yields a safety factor value for each line or part thereof. Although the sole basis for replacement or reinforcement of lines or parts of lines is a loading calculation, and the resulting safety factor value, GO 95 currently does not require that loading calculations must be performed using accurate data. This proposed rule change adds language that requires entities, which materially increase their loads on a structure, to perform a loading calculation based on current existing conditions and proposed configurations, information provided from other entities with facilities on the pole, conservative values, industry recognized values of relevant parameters, or any combination thereof.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all electric utilities and CIPs.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC incorporates standards for structures and materials that provide electric utilities and CIPs with clear guidance for reliably obtaining prescribed safety factors.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern practices and provide clear guidance for reliably obtaining prescribed safety factors. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facility will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

It is anticipated that any cost impacts to the CIPs and electric utilities would be negligible.

- Whether and how the costs will be recovered from customers.

With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because simplifies GO 95 rules, modernizes the rules and advances clarity. It will revise safety rules in GO 95 to reflect modern practices and provide clear guidance for reliably obtaining prescribed safety factors. This in turn will increase the safety and reliability of the facilities impacted by the proposed change.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

CMUA, LADWP, MID and SMUD

CMUA, LADWP, MID and SMUD support the adoption of this proposal because pole loading calculations for new installations are performed in the design phase, not post construction. Allowing utilities to use conservative values in pole loading calculations provides allowances for variations in material size, weight, etc. For example, defaults for wood pole circumferences are set at ANSI minimums by pole class in LADWP's pole loading software. Actual circumferences meet or exceed those minimums. Poles that exceed the minimum circumference have an added margin of safety.

(b) Comments in Opposition

Joint Utilities

Although voting neutral during the workshop process, after further deliberation and consultation with management, PG&E, SCE, PacifiCorp, CalPeco, and BVES now oppose the adoption of SED's proposed revision to Rule 44.2 because it does not add practical value, does not reflect modern practices, and does not provide clear guidance for reliably obtaining prescribed safety factors. This proposal does, however, mirror certain consensus revisions included in Proposed Rule Change (PRC) 8 in Appendix A of this Workshop Report and PRC 8 should be adopted.

SED's proposed revision purports to close a non-existent enforcement loophole. During the workshop process, SED voiced unsubstantiated concerns that companies could (or would) attempt to evade the clear and commonly understood requirement (in the existing rule) to perform a loading calculation.

Because SED's proposed revision to an otherwise consensus rule change is unnecessary, overly prescriptive, and adds no value to the understanding or application of Rule 44.2, it should be rejected.

Hans Laetz

Mr. Laetz supports the SED proposal with two critical additions. He uses the same proposed SED changes, but incorporating those additions, in the form of MAP 3B and refers to the rationale there.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T	X			
BVES		X		
CAL-FIRE		X		
CALPECO		X		
CCTA	X			
CMUA	X			
COMCAST	X			
COX		X		
SED (CPSD)	X			
CROWN CASTLE	X			
CTIA	X			
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz			X	
IBEW 1245				X
LA COUNTY	X			
LADWP	X			
MGRA				X
MID	X			
PACIFICORP		X		
PG&E		X		
SCE		X		
SDG&E	X			
SMALL LECS	X			
SMUD	X			
SPRINT NEXTEL	X			
SUNESYS	X			
SUREWEST	X			
TW CABLE	X			
T-MOBILE	X			
TURN				X
TW TELECOM				X
VERIZON	X			

MAP 3B – RULE 44.2 – ADDITIONAL CONSTRUCTION

Rule 44.2 Proposal by Hans Laetz

(1) Current Rule

44.2 Additional Construction

Any entity planning the addition of facilities that materially increase vertical, transverse or longitudinal loading 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.

Note: For the purpose of Rule 44.2, a material increase in load is an addition which 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.

(2) Strikeout/Redlined Proposed Changes

44.2 Additional Construction

Any entity planning the addition of facilities that materially increase ~~vertical, transverse or longitudinal~~ load~~ing~~s 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.

(3) Proposed Final

44.2 Additional Construction

Any entity planning the addition of facilities that materially increase 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 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 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 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.

(4) Rationale

Mr. Laetz proposes two additional modifications to Rule 44.2, as it is recommended for modification in MAP 3A. His MAP 3B thus adopts the changes proposed in MAP 3A with two proffered additional changes, shown in boldface italics in text box 2, above, and as discussed below:

(a) Reasonable verification that expected pole conditions are accurate.

Mr. Laetz proposes to add the requirement that any party that undertakes "Additional Construction" shall be required to certify that their loading and safety factor calculations made prior to the installation are, in fact, correct based on actual physical conditions at the structure, as reasonably verified by field observations. This would be accomplished by adding the parenthetical requirement that descriptions, plans or other records of wooden structures that are kept by wooden pole owners, licensees and tenants must actually match the physical conditions of the structure at the time of installation.

In the various workshops over the past eight months, CPSD (now SED) voiced its informed conclusion, based on its field observations, that actual installations and pole conditions in the field are often at extreme odds with what should be there based plans and records passed back and forth utilities and others in the Joint Pole Committees. SED has mentioned that this has led to inaccurate and pole loading calculations prior to new construction, sometimes resulting in eventual catastrophic failure and fires. Members of the workshop representing utility companies, CIPs, and contractors aver that these problems are caught in the field before or during the installation process, and that actual inspection is a "best engineering practice," but SED has stated in workshops that this is not always the case.

Adopting a parenthetical requirement that loading calculations be "reasonably verified by field observations" would simply add to Rule 44.2 the requirement that some responsible person

inspect the pole -- a crew chief, a section chief, someone -- and make a reasonable determination that the actual pole configuration was accurate when it was used to compute loads and safety factors. Because companies already ostensibly do this "best engineering practice," this change would merely codify a procedure that the utilities and CIPs maintain is already routinely done.

Workshop participants from the industry sector voiced concern at the workshops that a field observation of a pole might miss a small detail, such as incorrectly estimating the exact gauge of a cable high in the air. That is the rationale for the use of the modifier "reasonable." The intention of Mr.Laetz is not to require engineers to take out calipers and slide rules onsite, but only that a responsible party makes a reasonable determination that the loading calculations are based on the approximate actual installation.

But the introduction of that modifier triggered separate concern from other industry representatives, who fret that it is vague and unenforceable. Mr. Laetz posits that the SED often must make judgment calls as to the reasonableness of an engineering decision, and that the SED's power to determine reasonability is well-vested in the SED by the Commission.

(b) Loading calculations to be kept for life of equipment

Mr. Laetz also proposes that any party calculating loads and safety factors for Additional Construction should be mandated to keep such calculations for the life of the equipment, as opposed to the 10-year period delineated in MAP 3A. Investigations into past failures indicate that licensees and part-owners of poles have sometimes overloaded equipment based on faulty records and resultant pre-installation incorrect loading calculations, or companies were unable to produce such vital documents. A large percentage of the Additional Construction installations on poles have been done 10 years ago or longer, and it is prudent that the engineering data for them be maintained into the future. Given that the lifespan of poles and the installation on them can exceed 90 years, the consequences of inaccurate loading calculations will affect people for generations. The negligible cost of retaining documents cannot possibly outweigh the benefit of being able to consult them in the future. The companies have not offered any evidence that requiring document retention of already-segregated documents longer than 10 years would be an onerous or expensive burden.

People who live in High Fire-Risk Districts are asked to live with Additional Construction installations near their property for, in essence, an undefined time stretching to eternity. They will bear the burden of the implications of faulty loading calculations resulting in catastrophic failure. The burden of maintaining engineering records for the lifespan of the equipment does not constitute a great burden on companies when compared to the burden placed upon people in High-Risk Fire Districts by faulty loading calculations.

(5) Justification

- <u>The specific electric utilities, CIPs, and others affected by the PRC.</u>

Every IOU, POU, CIP and other entity undertaking Additional Construction on wooden structures in California will be affected by this proposed rule.

- <u>The current text of the affected GO(s), if any.</u>

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

As to the first proposed change, requiring reasonable field verification of loading condition parameters would bring modern "best engineering practices" into GO 95. It would remove future safety risks caused when Additional Construction engineering plans drawn up in offices are at odds with actual field conditions. As stated above, SED states that actual installations and pole conditions in the field are often at odds with plans and records. Adopting this provision would simply require that a company makes a reasonable determination that the pole configuration as encountered in the field is reasonably identical to those on the plans. Fire safety in High-Risk Fire Districts will be measurable increased if residents can be assured that Additional Construction relied on loading calculations based on actual pole conditions, not theoretical ones.

As to the second proposed change, which would require that pole loading calculations for Additional Construction be kept for the life of the equipment: The benefits to fire safety would include providing an impetus to utilities and CIPs to better engineer and retain loading calculations. The Commission and SED must have accurate loading calculations for all wooden structures, especially that (assumedly) millions of wooden poles where Additional Construction has occurred in the last 10 years. Fire safety would be increased because consumers and the SED would have access to the most-recent loading calculations (sometimes older than 10 years) when considering replacement or other changes to improve fire safety. Given that a large percentage of cases of Additional Construction in California are nearing the 10-year-old stage, it is imperative that loading calculations be maintained longer than an arbitrary 10-year mark.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

As to the first proposed change, fire safety will be improved as electric utilities and CIPs are given clear guidance that their loading calculations must be reasonably based on actual field conditions, as opposed to theoretical ones. The SED and Commission will be able to better enforce GO 95 provisions as they are assured that Additional Construction loading calculations are accurate. SED has stated that actual pole conditions are often at odds with the description of poles on plans. Adding facilities on a pole based on incorrect loading calculations poses an obvious hazard of failure and fire, and failures have occurred -- with catastrophic results -- in California.

As to the second proposed change, which would require that pole loading calculations for Additional Construction be kept for the life of the equipment: The Commission is, through Phase 3 Track 2, moving to collect fire-causing incident data to improve fire safety by detecting

trends for catastrophic failures. As SED analyzes this important information, it will become important for SED to retrace loading calculations from years past as it examines patterns of failure that lead to fires in High-Risk Fire Areas.

As many of the Additional Construction facilities added on wooden structures in High Fire-Risk areas were completed more than 10 years ago, it is imperative that the Commission order that engineering calculations for these existing installations be maintained, at very little comparative cost, for the life of the equipment.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

As to the first proposed change, which would require reasonable field verification of loading condition parameters: The requirement that loading calculations be "reasonably verified by field observations" would merely codify a procedure that the utilities and CIPs maintain is the current "best engineering practice." Other than adding a place for the appropriate engineer, supervisor or manager to "check off" and affirm that the field conditions were reasonably verified, there would be no additional cost to any company at the time of installation. Any subsequent costs for retaining or producing proof that such reasonable observations verified actual conditions will be incidental to the cost of maintaining other records as envisioned by this Rule.

The first part of the proposed rule change will financially benefit diligent and responsible utility or communication companies. Any Additional Construction by a new licensee or co-owner that is based on records that is at odds with actual field conditions and configurations places the original owner's equipment -- and the public -- in danger of catastrophic failure. The existing owners are owed a duty by the Additional Construction proponent to ensure that actual loading parameters are reasonably consistent with theoretical ones.

As to the second proposed change, under the language of MAP 3A, companies would be liable for identifying and segregating loading calculation records and maintaining them for 10 years. Mr. Laetz's proposed change would extend that requirement to the life of the equipment. It would not impose any additional act of identifying or segregating these records. Companies would merely continue to pay for continued secure document storage of them (or electronic facsimiles of them), amidst all their other documents, for the length of service of the equipment. At the time the equipment is removed, there would be no requirement that the records of the Additional Equipment be retrieved or removed, so no additional expense would be incurred then either. Therefore, the reasonable conclusion is that the longer storage period expense would be negligible when compared to the benefit of such retention.

The second part of the proposed rule change will also financially benefit diligent and responsible utility or communication companies. Both original owners and a licensee or co-owner should be able to discover other owners' records if (and anytime when) a failure occurs.

- Whether and how the costs will be recovered from customers.

(6) As argued above, the first part of the proposed rule change will financially benefit diligent and responsible utility or communication companies. Further, utilities and communications xComments

(a) Comments in Support

None.

(b) Comments in Opposition

CIP Coalition

MAP 3B proposes two unnecessary and unwarranted mandates:

- Every pole loading calculation including the underlying data the company receives from other pole tenants must be verified by field observations ; and
- All loading calculations must be maintained for the life of the equipment.

While similar to MAP 3A, which is opposed only by Mr. Laetz, MAP 3B's additional two criteria to the loading calculation process and information retention are burdensome, costly, and add little or no value. No party other than the proponent, Mr. Laetz, supports this MAP. The Commission should reject MAP3B.

Verification by Field Observation: MAP 3B's 'field verification' requirement presupposes, without any evidence, that pole records of the electric utilities and CIPs are generally incorrect and thus unreliable. Further, the proposal improperly assumes that the field personnel will have the requisite knowledge to identify and match the equipment attached to the pole to the database inventory of equipment for that pole. To the contrary, a pole load calculation is most likely to be accurate when the utilities with equipment on the pole provide their facility information based on their existing inventory records. While it may be true that a technician/engineer can identify equipment he or she is trained to design, construct and maintain, the technician/engineer is not likely to be able to specifically identify equipment owned by other utilities about which he or she has limited technical knowledge. For example, it is not reasonable to expect a CIP technician/engineer to know if the IOU equipment on a pole exactly matches the IOU inventory records, based on a visual inspection of the pole.

Moreover, as a practical matter, while a field review is generally part of the design and construction process for aerial infrastructure, a documented, detailed verification of every piece of information used and calculations made is neither necessary or beneficial. Furthermore, MAP 3B's "field verification" mandate is unenforceable and difficult to comply with. The proposal is unclear on how verifications of load calculations should be documented to prove the utility met the requirement of this rule. Would written documentation be required, or would pictures or videos of conditions antecedent to installation be necessary? Such means of verification may be needed for the CIP to show compliance with MAP 3B, but if implemented, it would impose undue burden on the field operations of CIPs and substantial costs to maintain the ever-growing records of calculations.

Record Retention: MAP 3B also requires that all pole loading calculations be maintained for the life of the equipment.[4] This excessively burdensome rule would result in a required record retention period of up to several decades far beyond the 10 years retention period the Commission established in Phase 2. The perennial record retention proposed by Mr. Laetz is a waste of resources, impractical and of little or no benefit. As a general rule, pole loading calculations become obsolete over time as they are replaced by newer calculations reflecting more recent activities on the pole. For example, if a pole loading calculation was done in the first few years after installation of the pole, and no activity occurred on that pole for the next 40 years, the initial pole loading calculation would have little relevance to the current condition of the pole, mainly because of the natural deterioration that would have occurred over the 40 year period. Because the conditions of loading may have changed significantly over decades-long deterioration, retained calculations would be obsolete, having little present day value to justify the cost and administrative burden of permanent retention.

Keeping large quantity of records for decades also places significant administrative and cost burden on utilities. The costs associated with maintaining pole loading records indefinitely are not merely limited to periodic server capacity upgrades but would require major changes to CIPs' practices in retention of construction and engineering records. The most substantial effort would involve the necessary isolation of loading related records from construction work plans and records. Most companies simply do not have that information isolated, and as a consequence, systems would have to be developed to perform such isolation. As systems are upgraded and replaced, these records would have to be migrated to new systems, which would require additional human and material resources.

Finally, MAP 3B's record retention requirement is an improper modification of the Commission's decision in Phase 2 that set a 10-year minimum limit for retention of load calculations. MAP 3B's perennial record keeping requirement would be disruptive to companies that have implemented that 10-year requirement, which was imposed only a year ago in January, 2012. For all these reasons, the Commission should reject MAP 3B.

CMUA, LADWP, MID and SMUD

CMUA, LADWP, MID and SMUD oppose this proposal because Phase 2 of this proceeding clearly established that pole loading calculations shall be maintained for ten years. The life of a pole can be decades, some poles are nearly 100 years old. Maintaining pole loading calculations for that period of time seems unreasonable, and may become inaccurate due to factors such as deterioration or incremental increases in load.

In regards to the language "as reasonably verified by field observations," there are some cases where field measurements are not required. For example, when new installations are added where a pole line did not exist, there may not be a need for a field visit. Additionally, a field visit may not be required when: (1) load is being added to a pole that requires a pole loading calculation; (2) there was a recent pole loading calculation performed for a previous installation; and (3) there have been no changes to the pole since that calculation.

[4] The term "equipment" is also problematic. Presumably "equipment" refers to the pole itself, and not various attachments, such as conductors, transformers or other hardware. The lack of clarity illustrates the lack of effort or expertise invested in developing the proposed MAP.

Joint Utilities

The Joint Utilities (PG&E, SCE, SDG&E, PacifiCorp, CalPeco, BVES) oppose the adoption of this proposed revision to Rule 44.2 because it does not add practical value, does not reflect modern practices, and does not provide clear guidance for reliably obtaining prescribed safety factors. This proposal does, however, mirror certain consensus revisions included in Proposed Rule Change (PRC) 8 in Appendix A of this Workshop Report and PRC 8 should be adopted.

This proposed revision piggy-backs on SED's proposal (MAP 3A) to close a non-existent enforcement loophole. During the workshop process, SED voiced unsubstantiated concerns that companies could (or would) attempt to evade the clear and commonly understood requirement (in the existing rule) to perform a loading calculation. This proposed revision would add two other changes on top of the SED's proposal - that pole loading calculations should be verified by field observations (adding unnecessary expense and wasting field resources) and that pole loading calculations be retained for the life of equipment (which makes no sense given the fact that the life of a pole can be over 50 years and only the most recent pole load calculation has any relevance).

Because this proposed revision to an otherwise consensus rule change is unnecessary, overly prescriptive, and adds no value to the understanding or application of Rule 44.2, like MAP 3A, this proposal should be rejected.

SED

MAP 3B is similar to MAP 3A proposed by SED, with two major differences. The first difference is that MAP 3B contains the addition of a parenthetical that reads "as reasonably verified by field observations." This parenthetical, while on the surface appears as good idea, creates confusion and would create enforcement and operational issues. Some of those issues are:

- How would a utility demonstrate compliance with this rule?
- How would this rule be operationalized for communications workers that are not experts in electrical equipment? And for electrical workers that are not experts in communications equipment?
- How would SED audit a company to show that it did "reasonably verify" the facilities?

In addition, MAP 3B requires load calculations to be kept for the life of the structure, instead of for 10 years as is currently required in Rule 44.2. SED does not have a position on this proposed change.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T			X	
BVES			X	
CAL-FIRE		X		
CALPECO			X	
CCTA			X	
CMUA			X	
COMCAST			X	
COX		X		
SED (CPSD)			X	
CROWN CASTLE			X	
CTIA			X	
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz	X			
IBEW 1245				X
LA COUNTY				X
LADWP			X	
MGRA				X
MID			X	
PACIFICORP			X	
PG&E			X	
SCE			X	
SDG&E			X	
SMALL LECS			X	
SMUD			X	
SPRINT NEXTEL			X	
SUNESYS			X	
SUREWEST			X	
TW CABLE			X	
T-MOBILE			X	
TURN				X
TW TELECOM				X
VERIZON			X	

MAP 4 – RULE 46 – VERTICAL STRENGTH REQUIREMENTS

Rule 46 Proposal by Hans Laetz

(1) Current Rule

46 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.

(2) Strikeout/Redlined Proposed Changes

46 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.

<u>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.</u>

(3) Proposed Final

46 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.

(4) Rationale

In the technical review panels, engineers from the various utilities discussed the need for consideration of "p delta" forces when calculating safety factors on wooden utility structures. This "p delta" was defined to this lay person as the unintended forces put on the structure caused by warping, leaning or other degradation that is visibly evident in hundreds of thousands of wooden poles in California. Many of the engineers expressed the opinion that good engineering practices would take into account any deviation from design configuration caused by deterioration or increased load additions.

Several of the engineers at the Technical Workshops expressed surprise that at least one major utility apparently does not include P delta in their safety factor calculations. When directly queried, SCE stated in the Technical Workshops that it would not disclose to SED whether "p delta" was an input variable it uses in its "proprietary" computations of safety factors for wooden structures. It is unfathomable to this commentator why such basic safety calculations would be considered "proprietary" by a utility and secret from the public, much less the regulatory agency. Even assuming that it is legitimate for SCE to classify this basic safety equation to be a secret from the Californians who rely on it, we are only left to guess as to whether SCE uses "p delta" in its calculations. The reasonable assumption is that SCE does not consider warped or leaning conditions of wooden poles when calculating their safety. Barring evidence to the contrary, and SCE has offered no such evidence, SCE safety factor calculations for wooden poles have not routinely included factors of unintended warp, bending or leaning.

SED has accused SCE of countenancing leaning poles that eventually caused catastrophic fires in recent years, including in the Malibu Canyon Fire of 2007, which is currently being investigated by the commission. Commission *ex parte* rules, and a non-disclosure agreement signed by Mr.

Laetz during OII 09-01-018 regrettably preclude evidence learned there from being discussed here. It can only be noted, without violating those strictures, that SCE and its use or non-use of "p delta" inputs is germane here, yet cannot be fully discussed because I.09-01-018 will drag on for seven years.

Nevertheless, the basic laws of physics state that a pole that is bent, warped or leaning over will not exhibit the same strengths, loads and potential points of failure as a truly-vertical pole, sitting within design specs that account for "p delta."

Like all of the regulations in GO 95 Title IV, this proposed rule would codify "best engineering practices" into regulations that can reasonably be understood by the affected parties and simply enforced by the SED and Commission.

It is acknowledged that the regulation change was proposed by a non-engineer, and the use of "angle of degree" as a measurement and the multiplier of 4.0 mathematical are arbitrary. The history of GO 95 shows that it has functioned since at least 1922 as an arbitrary set of standards. Many of the clearances and other standards used in the Rules are codifications of rules of thumb dating back to the telegraph and trolley car days, and are not backed up by a scientific rationale. The use of a multiplier of 4.0 for new construction, or of 2.67-- or 2/3rds of 4.0 -- for existing installations, are both standard within GO 95, and have served since 1922.

The proposed rule would be expressed in this equation:

$$sf = \frac{\text{[Prior } sf\text{]}}{\text{[(Deviation from intended orientation, in degrees) x 4.0]}}.$$

The number 4.0 is chosen to match the longstanding safety factor calculations for new construction. In this example, a pole that is leaning five degrees from its design (of being straight and plumb) would have a discount of [5 degrees times 4.0], or 20 percent, applied to the prior safety factor calculation.

Fire safety in High-Risk Fire Districts -- and everywhere in California -- will be measurably increased if residents can be assured that the safety factor of poles includes all best engineering practices.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

All companies that use wooden support structures would be affected.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

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. The proposed rule change will reduce fire hazards by reducing the number of poles that fail, particularly in High Fire-Risk Districts, because of unanticipated lean, warp or bending, aggravated by overloading. It will give SED specific, enforceable criteria with which to enforce Rule 48 and the requirements of GO 165. The costs of the proposed regulations are already recovered by utilities, as they are already charged with maintaining safe overhead equipment. This proposed merely codifies current "best engineering measures" that are already mandatory under other sections of GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

The state's current regulations of power poles can be summed up this way: utility companies are required to calculate safety factors based on proprietary formulae that are not publicly available, but are subject to state audit or forensic investigation by the Commission after a failure. Wooden poles have recently failed and caused catastrophic damage and endangered lives as a result of warped or leaning poles collapsing. The proposed rule would require utilities to consider warped or bent poles, something they are not always doing, when calculating safety factors.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Utilities and CIPs are already required to operate overhead structures in accordance with Rule 48 and best engineering practices. These Proposed Rule Change places no additional burden on them, other than accounting for the calculations that they used best engineering practices to meet GO 95 requirements. Thus, there is no increase in cost to utilities, POUs, CIPs or consumers. In fact, there will be a net cost savings, in the prevention of the types of conflagrations we have seen caused by warped, bent and leaning poles.

- Whether and how the costs will be recovered from customers.

There will be no costs to utilities, CIPs, POUs or others, see above.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

There will be no costs to utilities CIPs, POUs or others, see above.

- Why it is in the public interest to adopt the PRC.

The people of the State of California have a vital interest in ensuring that poles and lines near their homes and businesses are safe. They have a vital interest in being protected by regulations that mandate utility and communications companies to calculate pole loads and safety factors

using actual pole conditions, and that these calculations include best engineering practices. Like other sections of GO 95, this PRC spells out best engineering practices, and does not tell utilities how to do their work, but rather sets minimum standards for doing it. Approving this change would foster better compliance with other GO 95 rules, and better protect consumers and the state.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations..

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

CIP Coalition

MAP 4 proposes a reduction in strength based solely on the angle that the pole is leaning, without considering the vertical loads on the pole. This reduction is incorrect and unnecessary. Generally, free standing poles (contrasted with poles that have been guy-wired) are not subject to high P-delta force.

The P delta force in this relationship is the vertical load, i.e. weight exerted on the top of the pole. The delta is the deflection or distance from the vertical axis of the pole. When high vertical loads are present on top of a pole, they exert a large force on the pole. This force is not accounted for if the pole is assumed to be plumb, i.e. it does not lean (or is straight). A pole that is leaning will not reduce the strength of the pole unless there also are high vertical loads applied near the top of the pole.

Generally, free standing wood poles used for electric distribution and communication lines do not have high vertical loads applied near or at the top of the pole and therefore are not impacted by the P-delta effect even if they are leaning.

For example, if a 45 foot class 4 pole is leaning 5 degrees from the vertical axis, the proposed change under MAP 4 would effectively reduce the allowable strength of the pole by 20% whether or not there is a vertical load on near or on the top of the pole. In order for the strength of the pole to be reduced by 20%, a vertical load of approximately 1,300[5] pounds at the top of the leaning pole would be required. It is highly unlikely that any free standing poles would have wires weighing over 1000 pounds attached to the top of the pole.

The only poles where high vertical loads are applied near the top of the pole are guy-wired poles. These poles are usually raked , i.e., they lean away from the tension wires (toward the anchor) so that when the tension in the wire is increased, the pole will be pulled to a plumb (straight) position where P-delta force has no effect. In this case, the poles are leaning but the tilt is by design to minimize the effects of P-delta force.

MAP 4 is flawed in its construction and proposed application. All the parties present, except the proponent of MAP 4, correctly opposed the reduction in strength due to leaning. The Commission should reject MAP 4.

CMUA, LADWP, MID and SMUD

CMUA, LADWP, MID and SMUD oppose this proposal. The proposed method of calculation is random and not relevant. Pole lean is a variable that is considered when performing pole loading calculations.

Joint Utilities

The Joint Utilities (PG&E, SCE, SDG&E, PacifiCorp, CalPeco, BVES) oppose the adoption of this proposed change to Rule 46 because it is admittedly arbitrary, not in scope, technically incomprehensible, does not codify best (or any) engineering practices, and would be unenforceable.

The proponent is entitled to his own negative and personal views of SCE; however, these views are no substitute for demonstrated evidence of need or technical relevance to the proposed rule change. Further, the supporting rationale and responses to the supplemental questions demonstrate a fundamental lack of understanding of existing Rule 46 and other Section IV rules. Additionally, the proponent's reliance on technical panel conversations that occurred mid-year 2012 in support of this proposal is instructive, in that the proponent by his own admission is not an engineer and has no experience with regard to the design, construction, or inspection of overhead utility structures.

[5] 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 included). A 20% reduction in strength for this pole equals 4,380 foot-pounds. If the pole is 45 foot 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 3,610/3.35 or 1,307 pounds.

Because this proposal is unnecessary, technically unsound, and wholly unenforceable, it should be rejected, and instead the Commission should adopt the consensus revisions to Rule 46, identified as PRC 11 of Appendix A in this Workshop Report.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T			X	
BVES			X	
CAL-FIRE			X	
CALPECO			X	
CCTA			X	
CMUA			X	
COMCAST			X	
COX			X	
SED (CPSD)			X	
CROWN CASTLE			X	
CTIA			X	
DRA				X
EXTENET			X	
FRONTIER				X
H. Laetz	X			
IBEW 1245				X
LA COUNTY			X	
LADWP			X	
MGRA				X
MID			X	
PACIFICORP			X	
PG&E			X	
SCE			X	
SDG&E			X	
SMALL LECS			X	
SMUD			X	
SPRINT NEXTEL			X	
SUNESYS			X	
SUREWEST			X	
TW CABLE			X	
T-MOBILE			X	
TURN				X
TW TELECOM			X	
VERIZON			X	

MAP 5A – RULE 48 – ULTIMATE STRENGTH OF MATERIALS

Rule 48 Proposal by CIP Coalition

(1) Current Rule

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.

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

48 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.

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

(4) Rationale

MAP 5A (*formerly AP 6A)* corrects a mathematical error in Rule 48. The first paragraph of Rule 48, as currently written, incorrectly applies the safety factors for different materials set forth in Rule 44 (Table 4) to the maximum working loads. This is a technical error and is generally inconsistent with the application of safety factors in the rest of GO 95, including the second

paragraph of Rule 48, and generally accepted engineering practices for designing structures and facilities under GO 95.

GO 95 is based on the working strength design method. In almost every instance except the first paragraph of this rule, the safety factors are applied as a reduction to the strength of the materials by dividing the specified strength for each of the materials to be used in the construction by the minimum required safety factor required for the particular material. This method of applying safety factors is set forth explicitly in Rule 48.2, with respect to "Steel", and Rule 48.4, with respect to "Other Structural Materials". It is also explicitly demonstrated by the sample calculations contained in Appendix F, Part 1, Typical Problems, Example 11, Transverse Loads on Crossing Poles C and D, at F-11 to F-13. The first paragraph of Rule 48 is inconsistent with these other provisions of GO 95, which clearly indicate that safety factors should be applied to material strength only, and not loads.

If interpreted literally, Rule 48, as currently written, also results in illogical engineering design assumptions. Different materials have different properties and as a result, Rule 44 sets forth different minimum safety factors for different materials that may be used in constructing electric and communications facilities. Use of these different safety factors produces logical assumptions and results if applied as a reduction to the assumed *strength* of the different materials used in construction. However, application of the various safety factors to the *loads* for which the structure and its different components must be designed, produces illogical conditions or results. Applying the safety factors to the loads, instead of the material strength, results in different applied loads for different materials and components for the same structure or to different structures subject to the same conditions. In general, utility facilities, including all of their structural members, components and connections, should be designed to withstand the loads determined appropriate for the particular structure and component under the conditions to which it will be subject, in a consistent manner.

The first paragraph of Rule 48 is also inconsistent with the second paragraph of Rule 48. The first paragraph states that structural members and their connections shall be designed to meet the loads specified in Rule 43 "multiplied by the safety factors in Rule 44". The second paragraph states, however, that the "values used for the strength of material shall comply with the safety factors specified in Rule 44", implying, as other Rules and Appendix F state more clearly, that the strength of the materials used in the engineering design should be reduced by the safety factor appropriate for the particular material.

Finally, the current version of Rule 48 could potentially be interpreted – incorrectly – to require that the safety factor be applied twice, once to the strength of the material and again to the load. This interpretation would result in the mathematical squaring of the effective safety factor. For example, the design of a Grade A wood pole would require multiplying the design loads by a safety factor of 4 and dividing the wood pole strength by a safety factor of 4 which would result in an effective safety factor of 16 (i.e., 4 x 4), whereas sound engineering practice, as well as the clear intent of the Commission, is to require that safety factors be applied only once.

The reference in Rule 48 requiring safety factors to be applied to the load is a technical error and should be corrected. No outside plant technical expert participating in the technical panel

deliberations and Workshops in Track 1 disagreed that it is technically incorrect and should be remedied.

MAP 5A corrects the error by deleting the language that could be interpreted to require multiplying the loads by the safety factors. This correction will eliminate the inconsistency between the first paragraph of Rule 48 and other provisions of GO 95. The correction also clarifies that structures and all of their components should be designed to withstand the loads for which they are required to be designed in a uniform and consistent manner, e.g., a wind load of 8 lbs/ft^2. on all of the components, with the safety factors applied correctly as a reduction to the material strength of each component based upon the values applicable to each particular material used in the design consistent with Rule 44 (i.e., Grade A steel yield strength/1.5, wood rupture strength/4.0, insulator strength/3.0, etc.). Finally, the proposal eliminates any possibility that Rule 48 could be misinterpreted as requiring a mathematical squaring of the effective safety factor and ensures that Rule 48 is clear and unambiguous and can be applied by all parties and enforced by the Commission in a uniform, consistent and fair manner.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the MAP.

This proposal addresses and clarifies how safety factors should be applied in the design and construction of electric and communications facilities subject to GO 95 by every electric utility and CIP that installs facilities on a utility pole in California.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

In D.12-01-032, the Commission stated its intent to consider revising section IV of GO 95 "to reflect modern materials and practices" and further stated that such revisions should "incorporate standards regarding wood structures and materials that (a) 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 (b) can be enforced by the Commission and the Commission's Consumer Protection and Safety Division (CPSD)." D.12-01-032, mimeo at 121 and Ordering Paragraphs 8(i) and (ii). This proposal addresses these goals by eliminating a technical error and clarifying how safety factors should be applied, thereby providing electric utilities and CIPs with clearer guidance for implementing prescribed safety factors.

- How the MAP reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

Eliminating the technical error in Rule 48 and clarifying how safety factors shall be applied in the design and construction of electric utility and CIP facilities and structures will help ensure that minimum required design standards are clear and unambiguous and applied by design engineers and by the Commission in a uniform, consistent and reasonable manner. This will help ensure that design requirements intended to reduce fire hazards associated with such structures are properly interpreted and applied as intended by the Commission, consistent with its goals and objectives.

- The anticipated costs of the MAP, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

This proposal will eliminate a technical error in Rule 48 that has been recognized by engineers. As a result, correcting this error is not expected to have any significant effect on the design or construction of utility or CIP facilities or structures or to increase the costs incurred in constructing such facilities.

- Whether and how the costs will be recovered from customers.

The proposal is not expected to increase the costs to electric utilities or CIPs.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

The proposal is not expected to increase the costs to electric utilities or CIPs.

- Why it is in the public interest to adopt the MAP.

The proposal will correct a technical error in Rule 48 and clarify the manner in which safety factors should be applied in engineering and constructing electric utility and CIP facilities. Doing so will help ensure that Commission requirements for the design and construction of such facilities are clear, unambiguous, and can be understood and applied in a uniform and consistent manner by all parties. It will also help ensure that the Commission and SED are able to enforce these rules in a consistent, fair and equitable manner. Finally, a clear understanding of how safety factors should be applied will help facilitate consideration by the parties and the Commission of a potential new High Fire Threat District and potential new higher wind loading requirements for the High Fire Threat District and the costs and benefits of adopting such additional new requirements in Track 3 of this proceeding.

- If the MAP applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing rule contained in GO 95 that complements and poses no conflict with existing federal or state regulations.

- Whether the MAP is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the MAP can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

Hans Laetz

In D.12-01-32, the Commission considered the exact same argument posited in MAP 5A. The Commission held that the Joint Utilities in Phase 2 of this proceeding "did not present a reasonable justification for revising Rule 48." D.12-01-132 at 120. "The primary purpose of this proceeding is to consider and adopt measures to reduce the fire hazards associated with overhead facilities," the Commission said. "The Joint Utilities' 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 Joint Utilities' proposal seeks to do. Therefore, we decline to adopt the Joint Utilities' proposal." D.12-01-32 at 120, 121.

Here, CIP brings back the exact same argument. It raises, not unreasonably, the mathematical error inherent in multiplying the safety factor by the load in a potential enforcement action. SED has made it clear it has never applied the Rule that way, and does not intend to do so either. In the workshops, SED made it clear that this worry was a bogeyman. SED also offered that it would be amendable to revisiting this issue once the High Fire-Risk Area maps and regulations are promulgated.

Importantly, SED repeatedly warned during the workshops that instituting such a change would, because of case law and past Commission enforcement actions, have the immediate and practical effect of lowering the effective Rule 48 standard of sustained winds of 92.4 miles per hour to 56 miles per hour, statewide. This would be an immediate and disastrous decrease in the protections that the people of California rely on, and would gut Rule 48 before a rationale replacement can be structured and tested in the form of graduated safety standards for specific, different climatological, topographic and fire fuel load conditions in California.

The CIP Coalition proposal would significantly weaken existing wooden structure regulations in California in general and High Fire-Risk Areas in particular. It is thus out of scope, per the operative Commission decision ("Phase 3 of this proceeding is instituted to consider, develop, and adopt regulations ... revising Section IV of GO 95 to reflect modern materials and practices with the goal of improving fire safety." D.12-01-032 at 170.) The proposal is out of scope because it would demonstrably reduce, not improve fire safety. The CIP Coalition is also out of scope as set forth in the Scoping Memo ("the purpose of this rulemaking proceeding is to consider and adopt measures to reduce the fire hazards associated with (1) overhead power-line facilities, and (2) aerial CIP facilities in close proximity to overhead power lines." R.08-11-005 Phase 3 Scoping Memo at 1.) The CIP Coalition proposal would reduce fire safety, and is thus out of scope.

Absent the threat of a mistaken application of Rule 48, and SED vows it will not misapply Rule 48, there can be no reason to make any precipitous change to any part this critical Rule until replacement regulations are ready.

There is no reasonable rationale to oppose removing the word "ultimate" from the title and content of Rule 48.

MGRA

MGRA supports MAP 5C, proposed by SED and opposes MAPs 5A and 5B.

Returning to the original intent of this Order Instituting Rulemaking:

"This OIR is being issued to review the current safety requirements and consider possible rule changes that may further reduce the hazards, particularly fire hazards, associated with the electric transmission and distribution facilities and communications facilities. " Therefore, any proposed GO 95 modification that might potentially reduce safety should be carefully scrutinized and not be considered if its net impact on California residents is deleterious. MAP 5A and 5B fall into this category.

Currently SED interprets Rule 48 to mean that no pole should fail due to wind loading at wind speeds of less than 92.4 mph. It also states that adoption of either MAP 5A or 5B would reduce this to 56 mph. Such a reduction in enforcement standards would likely lead to a substantial reduction in fire safety, which directly opposes the intent of this OIR. The Alliance therefore strongly opposes MAP 5A and MAP 5B.

Should any change be made to the method used to calculate enforcement standards, this must be done in such a way that overall safety is not compromised. Therefore the Alliance supports the holistic approach suggested in MAP 5C, which would couple any changes in calculation method with identification and application of high fire risk districts through the application of the high-resolution fire hazard maps being developed in Track 3.

SED

While the text changed by 5A and 5C are the same they will result in different outcomes. Adopting this revision to Rule 48 now will not enhance safety, and in fact will reduce current

safety standards throughout the state. As discussed in MAP 5C, SED is amenable to making certain revisions to Rule 48, but only once the Commission has adopted and implemented high fire threat/wind maps and special wind loading districts based on those maps. By approving 5A at this time, the Commission will be changing the minimum wind pressures that structures must withstand. For example, current law requires a joint use wood pole to withstand at least a wind pressure of 21.36 pounds per square foot (which equates to approximately 92 MPH); however, by approving these changes this structure would only have to withstand a wind pressure of 8 pounds per square foot (approximately 56 MPH). This change will be applicable statewide, which will be a disservice to portions of California, specifically those areas affected by the Santa Ana winds. The supporters of this rule will state that a 92 MPH standard would result in overbuild for portions of the state; however, the counter argument holds that 56 MPH is not a stringent enough standard for many areas. That is why SED supports not changing the rule until GO is modified with other wind loading districts.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T	X			
BVES	X			
CAL-FIRE		X		
CALPECO	X			
CCTA	X			
CMUA	X			
COMCAST	X			
COX	X			
SED (CPSD)			X	
CROWN CASTLE	X			
CTIA	X			
DRA				X
EXTENET	X			
FRONTIER				X
H. Laetz			X	
IBEW 1245				X
LA COUNTY			X	
LADWP	X			
MGRA			X	
MID	X			
PACIFICORP	X			
PG&E	X			
SCE	X			
SDG&E	X			
SMALL LECS	X			
SMUD	X			
SPRINT NEXTEL	X			
SUNESYS	X			
SUREWEST	X			
TW CABLE	X			
T-MOBILE	X			
TURN				X
TW TELECOM	X			
VERIZON	X			

MAP 5B – RULE 48 – ULTIMATE STRENGTH OF MATERIALS

Rule 48 Proposal by San Diego Gas & Electric (SDG&E)

(1) Current Rule

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.

(2) Strikeout/Redlined Proposed Changes

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 factor specified 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.~~

(3) Proposed Final

48 Strength of Materials

Structural members and their connections shall be designed and constructed 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.

(4) Rationale

The technical and engineering representatives of the electric utilities and CIPs that were requested to participate in the Phase 3 workshops strongly and unanimously agree that there are two significant technical problems with the current version of Rule 48. The technical and engineering experts also agreed these errors require the earliest possible correction. If these errors are not corrected, they will almost certainly become a barrier to electric utilities and CIPs

supporting implementation of modified wind loading criteria for the design of facilities based on the findings from Track 3. That is, because the existing errors in Rule 48 can be interpreted to pose potential multiplicative impacts on the loadings used for the design of lines and have other far-reaching implications, the failure to correct Rule 48 immediately, prior to convening future collaborative efforts aimed at reducing fire hazard(s) associated with wind loads in High-Fire-Threat Districts, will require parties to draft regulations for the High-Fire-Threat Districts taking into account the effects of the technical errors in Rule 48 as currently written. This would be unfortunate considering the importance of the wind loading issue, and the positive, collaborative progress toward the objective of reducing fire hazard(s) that has been achieved thus far through the technical panel and workshop processes. Further, these problematic requirements are currently subject to multiple and misleading interpretations when taken in context with the balance of the Rules in Section IV of GO 95 and the examples in Appendix F.

In the Phase 3 Panel 1 Report, the CIP Coalition provided the following Proponent Rationale for AP 6B which SDG&E is now sponsoring. SDG&E's technical representatives who participated in the Phase 3 workshop believe that the CIP Coalition's rationale as represented in the Phase 3 Panel 1 Report clearly describes the issues in Rule 48 requiring correction and therefore includes this rationale in its entirety below.

CIP Coalition Proponent Rationale from Phase 3 Panel 1 Report: There are two primary technical issues with the way that Rule 48 is currently crafted: (1) the concept of "will not fail" is not utilized by structural engineers as it is not a technically feasible standard or otherwise used in the engineering world; and (2) the last phrase of the existing rule, i.e., "multiplied by the safety factor specified in Rule 44", incorrectly applies the safety factor to maximum working loads. The revisions noted above attempt to address both of these issues while revising the rule so that it is consistent with up-to-date engineering practices and the National Electrical Safety Code. The goal is to create an improved, technically accurate, more precise rule in which strength and safety factors are properly applied.

(a)"Will not fail" is inconsistent with accepted engineering principles and procedures.

Presently accepted engineering procedures (e.g., Load Resistance Factor Design, LRFD) recognize that all structures are inherently of variable strength, and therefore have a low, albeit finite (non-zero), probability of failure under real world conditions. "Will not fail" is simply not a standard utilized by structural engineers.

(b)The current rule incorrectly applies the safety factors to working loads.

Furthermore, Rule 48 as currently written incorrectly applies the safety factors to the maximum working loads, whereas safety factors in GO 95 are more generally applied to material or structural strength. GO 95 is based on the working strength design method. In every case except this rule, the safety factor reduces the strength of materials by dividing the strength by the safety factor. This proposed rule change will have Rule 48 apply the safety factor to the material strength in the same manner as all other sections of GO 95.

Moreover, the current version of Rule 48 could be interpreted – incorrectly - to require that the safety factor be applied twice: once to the strength of the material and once to the load. This

interpretation would result in a mathematical squaring of the effective safety factor. For example, under this interpretation, the current version of Rule 48 for the design of a Grade A wood pole could be read to require multiplying the design loads by a safety factor of 4 and dividing the wood pole strength by a safety factor of 4. In practice, this would result in an effective safety factor of 16 (i.e., 4x4), whereas the intent of GO 95, as well as sound engineering practice, would dictate a safety factor of 4. It is imperative that this inconsistency be corrected at this time particularly as development of additional, and potentially more stringent, loading criteria for use in a High-Fire Threat District is considered. Failure to address this issue could lead to additional compounding of the safety factors in the High-Fire Threat District.

Additionally, because the safety factor is not the same for each material, the applied load as currently defined by Rule 48 results in different applied loads for different materials. Adoption of this MAP will remove this inconsistency. The entire line would be designed to withstand a wind load of 8 psf on all of the components and each material strength could be reduced by the appropriate safety factor, consistent with Rule 44 (i.e., steel yield strength/1.5, wood breaking strength/4.0, insulator strength/3.0, etc).

Finally, the examples in Appendix F, Part 1 (e.g., Example 11, Transverse Loads on Crossing Poles C and D) clearly indicate the intended application of the safety factor, which is only applied (once) to the material strength and not at all to the loading. The incorrect wording in Rule 48 can be concluded to be an obvious inadvertent error, requiring correction.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This MAP will help to clarify GO 95 and facilitate the adoption of appropriate standards in the High-Fire-Threat Districts to be developed in Phase 3 of the Commission fire-safety rulemaking.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This MAP will modify GO 95 to reflect modern materials and/or practices and facilitate the adoption of appropriate standards in the High-Fire-Threat Districts to be developed in Phase 3 of the Commission fire-safety rulemaking. By doing so, it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, the proposed revision will reduce the risk that affected facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

No additional costs have been identified. As noted previously, the proposed revision will correct existing errors in Rule 48 as currently written and will not affect the manner in which Rule 48 is applied in the design and construction of overhead facilities, indicating that there will be no cost effects resulting from the adoption of the revisions.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This MAP clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

CIP Coalition

This proposal will correct both of the significant technical errors in existing Rule 48: (1) the incorrect application of safety factors to both maximum working loads and material strengths; and (2) the unrealistic and unattainable bar on failure of any components, facilities or structures.

The CIP Coalition supports this proposal for all of the reasons referred to in the portions of the justification quoted by the proponent of the MAP from the CIP Coalition's earlier comments in the Phase 3, Panel 1 Report regarding AP 6B. As the CIP Coalition noted in its prior comments, the provision of the current rule regarding how safety factors should be applied is in error – plain and simple. No technical expert participating in the technical panel deliberations or Workshops disagreed that it is technically incorrect and in need of correction. The prohibition against material or structural failure is unrealistic and inconsistent with modern accepted engineering practice. Modern engineering practice acknowledges the existence of natural variations in material strength and implements design procedures to ensure that the likelihood of material or component failure is acceptably low, consistent with the intended application.

The proposal clarifies that structures and all of their components should be designed to withstand the loads for which they are required to be designed, in a uniform and consistent manner, with safety factors applied as a reduction to the material strength of each component, based upon the values set forth in Rule 44 for each material used in the design. This clarification will eliminate the technical errors in the existing rule, consistent with accepted engineering practice. These revisions will help ensure that requirements for the design and construction of electric utility and CIP facilities are clear and can be understood and enforced in a uniform and consistent manner. They will also help facilitate consideration by the Commission and the affected parties of potential new wind loading requirements for a potential new High Fire Threat District in Track 3 of this phase of this proceeding.

(b) Comments in Opposition

Hans Laetz

The arguments against MAP 5A, above, are incorporated herein.

In its rationale, SDGE admits that its proposed changes are a resurrection of the CIP Coalition's Phase 2 arguments for changing Rule 48. SDGE even copies the same CIP rationale. As argued supra, the Commission just last year examined those arguments and found that the utilities "have not presented a reasonable justification for revising Rule 48."

SDGE also makes -- again -- the argument for shifting away from safety factor-based design to LRFD. While there may be merit to such a move, the Scoping Memo specifically rules out of scope any talk of "replacing GO 95's design methodology for structures and facilities." R. 08-11-05 at 4.

SDGE's arguments are not only repetitive and a matter of res judicata, they are directly out of scope.

Further, SDGE asserts that the workshop's "technical and engineering experts also agreed these errors require the earliest possible correction." That is not correct. SED's technical and engineering experts most certainly did not agree that the formula error needs to be corrected before High Risk Fire Districts and associated regulations are promulgated. SED repeatedly told the utilities and communications companies that they are open to changing Rule 48 if and when -- and only if when -- appropriate fire district regulations are in place. Mr. Laetz joins in SED's repeated argument that the bad formula appears to be a straw man.

Incredibly, SDGE threatens that if Rule 48 -- which has been in effect for decades -- is not changed immediately, its supposed errors therein "will almost certainly become a barrier to electric utilities and CIPs supporting implementation of modified wind loading criteria for the design of facilities based on the findings from Track 3." SDGE justifies this promise with the explanation that "failure to correct Rule 48 immediately, prior to convening future collaborative efforts aimed at reducing fire hazard(s) associated with wind loads in High-Fire-Threat Districts, will require parties to draft regulations for the High-Fire-Threat Districts taking into account the effects of the technical errors in Rule 48 as currently written."

There is nothing in D.12-01-32, its Scoping Memo, Commission rules or in the world of common sense that would require the parties drafting High Fire-Threat District maps to write those rules without a concurrent Rule 48 correction in mind. Doubtlessly, Rule 48 and its error can be addressed as the fire rules are drafted. It is -- to use a legal term of art -- just plain silly to imagine "future collaborative efforts" being harmed by retaining Rule 48 and its important protections until the augmentative High Fire-Risk District maps and regulations are adopted by the Commission.

SDGE worries that the current version of Rule 48 could be interpreted - incorrectly - to require that the safety factor be applied twice: once to the strength of the material and once to the load. SED has repeatedly assured the IOUs that they have never, and will not, make that mistake. SDGE apparently cannot wait until the High Fire-Risk District maps and regulations are promulgated to correct this. While we share the desire to see that done, there is no impetus to remove the 92 mph standard in favor of the 56 mph standard -- as SED repeatedly said this will do -- for the few months we all must wait for the maps.

There is no reasonable rationale to oppose removing the word "ultimate" from the title and content of Rule 48.

MGRA

MGRA supports MAP 5C, proposed by SED and opposes MAPs 5A and 5B.

The Alliance's comments on MAP 5A also apply to MAP 5B. In addition to the provisions of MAP5A contained in MAP 5B, MAP 5B removes the "will not fail" requirement stated in GO 95, Rule 48: "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…" (emphasis added). SDG&E has put this proposal forward with the

justification that "the concept of 'will not fail' is not utilized by structural engineers as it is not a technically feasible standard or otherwise used in the engineering world."

We would like to draw attention to the point that regardless of the "will not fail" language's applicability as a construction standard, it provides a very clear enforcement standard. SED does not have the resources to inspect and monitor every piece of utility equipment that is installed in the state of California, nor would it probably be an efficient use of ratepayer dollars for it to provide that level of scrutiny. It likewise has limited means to control the quality of utility inspections. The only real quantitative test of a utility's infrastructure comes when high winds blow. That is when everyone learns whether the utility's construction, maintenance and inspection are adequate. If there are systemic issues with construction materials and methods, or with inspection and maintenance processes, even at a very low level of probability, these can result in multiple failures and fires under extreme weather conditions. It is the responsibility of the utilities to do everything in their power to reduce chances of dangerous failures to as low a level as they can. MAP 5B, on the other hand, would allow them to be absolved of responsibility once they've met basic construction and inspection requirements.

The "will-not-fail" language currently in Rule 48 means that SED does not need to delve into the details of construction or inspection. It means that any failure that occurs at less than the maximum working load is a de facto violation of GO 95 that can trigger immediate corrective action by the Commission. It is then the utilities' responsibility to ensure that the probability of structural failure that can cause fire or other damage under extreme weather conditions (and result in potential penalties) remains at a risk level the utility considers acceptable. Otherwise, if MAP 5B is adopted, we run the risk of having "compliant" infrastructure that results in multiple failures and potentially catastrophic fires under worst-case conditions.

While we would prefer to leave the determination of optimal language to CPSD and the utility engineers, we would assert that the following must be true in order for this Rulemaking to be a success: No changes to GO 95 should be made that reduce or compromise the enforcement standards that are currently used by CPSD.

SED

The changes proposed in MAP 5B do nothing to decrease the risk of fires caused by electric and communication lines. In fact this proposal does the exact opposite by lowering the safety requirements of line elements by removing the phrase "will not fail." This is because the MAP changes Rule 48 from a performance standard into just a design standard. The PRC would allow a pole to fail when little or no wind was present, and a utility to not be in violation of GO 95 because they can point to the fact that they designed the pole correctly in accordance with the rule. In addition, in order for SED to enforce this proposed revision to Rule 48, SED would need to obtain data that it is not currently getting from the utilities. SED would be unable to analyze whether utilities are in compliance with the proposed rule without the appropriate data.

While the proponents argue that other engineering standards do not have a "will not fail" clause, there is one major distinction between GO 95 and other engineering standards in that GO 95 is law, not a standard. There are certain policy considerations that are embodied in the current language of Rule 48. Just as a policy matter, the Commission should be able to point to some

minimum wind speed at which a pole will not fail –it cannot tell the public that poles will fail but that we do not know under what circumstances. The "will not fail" language also provides incentive to the utilities to design their poles in such a way that the probability of failure is so small that it is unlikely to lead to a violation of the rule. They can and do use larger poles where circumstances warrant them; they also can and do design above the currently listed safety factors. The "will not fail" language also provides utilities incentives to improve technologies.

Finally, SED believes the Commission should not consider any revisions to Rule 48 unless and until the GO is modified with other wind loading districts.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T	X			
BVES	X			
CAL-FIRE		X		
CALPECO	X			
CCTA	X			
CMUA	X			
COMCAST	X			
COX	X			
SED (CPSD)			X	
CROWN CASTLE	X			
CTIA	X			
DRA				X
EXTENET		X		
FRONTIER				X
H. Laetz			X	
IBEW 1245				X
LA COUNTY			X	
LADWP	X			
MGRA			X	
MID	X			
PACIFICORP	X			
PG&E	X			
SCE	X			
SDG&E	X			
SMALL LECS	X			
SMUD	X			
SPRINT NEXTEL	X			
SUNESYS	X			
SUREWEST	X			
TW CABLE	X			
T-MOBILE	X			
TURN				X
TW TELECOM		X		
VERIZON	X			

MAP 5C – RULE 48 – ULTIMATE STRENGTH OF MATERIALS

Rule 48 Proposal by SED

SED does not recommend making any revisions to Rule 48 at this time. However, SED offered the below proposal at the all-party workshops to demonstrate that SED is amenable to making certain revisions to Rule 48 once the Commission has adopted and implemented high fire threat/wind maps and special wind loading districts based on those maps. [It should be noted that the deletion of the term "Ultimate" is part of a consensus PRC as shown in WR-PRC13. SED agreed with this revision and it was reflected in this proposal.]

(1) Proposal

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.

……

SED agrees to remove any opposition to the above proposed revision to Rule 48 if all of the following conditions are met:

a. *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;*
b. *The revisions to Rule 48 will not become effective until the special wind loading districts have been adopted and implemented into Rule 43;*
c. *Rule Change Proposals 6A and 6B are withdrawn at this time.*

(2) Rationale

As SED stated in its comments on the Technical Panel 1 Report, SED may be amenable to certain revisions to Rule 48 in the manner shown above, once high resolution fire threat/wind maps and special wind loading districts are developed for California. Until that effort is complete, SED strongly recommends that no changes be made to Rule 48. Prior to adopting any revisions to Rule 48, the Commission should be aware of the actual conditions that are present in California. SED interprets the current language of Rule 48 so that a grade "A" pole should not fail at any wind speeds below 92.4 miles per hour (mph). The proposed revision eliminates the current language in the rule requiring the multiplication of the safety factors in Rule 44, resulting in changing that wind speed to 56 mph. However, this wind speed is not appropriate or adequate

for many areas in the state of California. If Rule 48 is changed prior to the implementation of high resolution fire threat/wind maps and special wind loading districts, some areas of the state will be underbuilt. Accordingly, SED proposes that Rule 48 only be changed once the wind/fire threat maps have been developed and actual conditions for California are determined. The above proposal is intended to demonstrate that SED is in fact amenable to revising Rule 48, once the maps and special loading districts are in place.

(3) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIPs and electric utilities.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

SED recommends that no changes to Rule 48 be made until the Commission has adopted and implemented high resolution fire threat/wind maps and special wind loading districts for California.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Not applicable.

- Whether and how the costs will be recovered from customers.

Not applicable.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

It is in the public interest to not make any revisions to Rule 48 unless and until the Commission has adopted and implemented high resolution fire threat/wind maps and special wind loading districts for California. Making revisions to Rule 48 at this time will not increase safety, and in fact, will reduce current safety regulations.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This recommends no changes to a GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(4) Comments

(a) Comments in Support

MGRA

MGRA supports MAP 5C, proposed by SED and opposes MAPs 5A and 5B.

The Alliance's comments on MAP 5A also apply to MAP 5C.

We concur with SED that "It is in the public interest to not make any revisions to Rule 48 unless and until the Commission has adopted and implemented high resolution fire threat/wind maps and special wind loading districts for California. Making revisions to Rule 48 at this time will not increase safety, and in fact, will reduce current safety regulations."

Since the overall goal of this OIR is to improve public safety, it may be possible to use knowledge gained through the development of high resolution fire threat and wind maps to designate special districts where more stringent engineering and operation standards apply. If so, it may then be possible to alter the Rule 48 definitions while still improving overall safety.

However, the attempt to force the changes proposed in MAP 5A in MAP 5B without any corresponding adjustments to make countervailing safety improvements will reduce safety

overall for California residents. For this reason, the Alliance believes that the Commission should reject MAP 5A and MAP 5B and adopt SED's MAP 5C.

(b) Comments in Opposition

CIP Coalition

This proposal will correct one of the two significant technical errors in existing Rule 48 – the error in regard to how safety factors should be applied, but will defer the correction until after the Commission has adopted and implemented new High Fire Threat maps and new wind loading requirements based upon the new High Fire Threat maps.

The CIP Coalition opposes this proposal. There is no disagreement among technical experts that existing Rule 48 is in error in regard to how safety factors should be applied and is inconsistent with both good engineering practice and other provisions of GO 95, including Rule 48.2, Rule 48.4 and Appendix F. There is no technical, economic, or policy grounds for not immediately correcting this error and there are very compelling reasons for doing so. Clarifying Rule 48 is necessary to eliminate ambiguities in GO 95 regarding how safety factors should be applied and conform Rule 48 to accepted engineering practice. It is also necessary in order to establish a clear understanding by all parties of applicable engineering design requirements and parameters in order to facilitate consideration by the Commission and the interested parties of potential new wind loading requirements in Track 3 of this phase of this proceeding.

CMUA, LADWP, MID and SMUD

CMUA, LADWP, MID and SMUD oppose this proposal, due to the conditions put forth by the SED. It is unknown how long Track 3 of Phase 3 will take to complete and what the ultimate result will be. It is unreasonable to condition acceptance of this rule change on such an uncertain event. Additionally, many electric utilities have already provided the SED with information about special load cases that they apply to their facilities in high wind and/or fire-threat areas. For example, the SED has reviewed some of LADWP's pole loading calculations that meet the requirements of MAPs 5A or 5B, and SED has not identified any issues with the application of the safety factor to the strength of materials only, or to both the strength of materials and the load cases as identified in Rule 43.

Joint Utilities

The Joint Utilities (PG&E, SCE, SDG&E, PacifiCorp, CalPeco, BVES) oppose MAP 5C because it would prolong a material error in existing Rule 48 until the Commission adopts and implements a high resolution fire-threat map for the entire state as well as special "wind loading districts" (the latter of which was not included in the scope of this Rulemaking).

The electric utility and communication company technical experts unanimously agree that there are two significant technical errors in the current version of Rule 48 that should be corrected as soon as possible. (See MAPs 5A and 5B for detailed information on the above referenced technical problems.) Deferring the correction of these errors will inhibit efforts to improve fire safety and will unnecessarily delay the development of any necessary revisions to GO 95 in Track 3.

SED's reasoning for deferring any revision to Rule 48 is invalid because "known local conditions" are already addressed in Rule 31.1. In addition, SED's assertion that a Grade A pole should not fail at any wind speed below 92.4 mph is demonstrably false and simply perpetuates a technically unsound rule interpretation. Further, SED's associated proposals - MAPs 6B, 7B, 8B, and 9B, compound the problem by perpetuating confusing requirements and creating the potential for multiple interpretations regarding the application of safety factors. This is counterproductive to efforts to ensure consistency among all interested parties in establishing the strength criteria to be used in the design and analyses of lines.

What is instructive is that SED is admittedly willing to consider correcting at least one of the errors in Rule 48, albeit at a later date, by removing the verbiage "…multiplied by the safety factors in Rule 44". Section IV of GO 95 includes numerous other examples of the working strength design method where material strengths are divided by safety factors. The Joint Utilities urge the Commission to consider and adopt revisions to Rule 48 as submitted in MAP 5B, so that all existing errors are corrected as soon as possible and so that GO 95 does not contain erroneous guidance. Because SED's associated proposals are inconsistent with the objective of improving fire safety and adding clarity to GO 95 rules, this instant proposal MAP 5C (as well as MAPs 6B, 7B, 8B and 9B) should be rejected.

(5) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T			X	
BVES			X	
CAL-FIRE		X		
CALPECO			X	
CCTA			X	
CMUA			X	
COMCAST			X	
COX			X	
SED (CPSD)	X			
CROWN CASTLE			X	
CTIA			X	
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz		X		
IBEW 1245				X
LA COUNTY	X			
LADWP			X	
MGRA	X			
MID			X	
PACIFICORP			X	
PG&E			X	
SCE			X	
SDG&E			X	
SMALL LECS			X	
SMUD			X	
SPRINT NEXTEL			X	
SUNESYS			X	
SUREWEST			X	
TW CABLE			X	
T-MOBILE			X	
TURN				X
TW TELECOM				X
VERIZON			X	

MAP 6A – RULE 48.1 – WOOD

Rule 48.1 Proposal by San Diego Gas and Electric (SDG&E)

(1) Current Rule

48.1 Wood

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.

Table 5 Wood Strengths

Species	Modulus of Rupture Bending (a)	
	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	6,800 (c) lbs per square inch
Fir, white or red, local	4,700 lbs per square inch	5,600 lbs per square inch
Pine, southern yellow, dense	6,300 lbs per square inch	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.

(2) Strikeout/Redlined Proposed Changes

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.~~

(3) Proposed Final

48.1 Wood

A. Natural Wood (Non Laminate)

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	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

(4) Rationale

This MAP will modify GO 95 to reflect modern materials and/or practices. The wood strength values listed in Table 5 are archaic and are not supported by any currently published timber industry standard. Moreover, GO 95 does not currently provide for the use of laminated wood products in the design and construction of lines. This PRC modernizes Rule 48.1 by adding references to the applicable American National Standards Institute, ANSI O5 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 by modifying Table 5 to include samples of wood pole strength values from ANSI O5.1. The referenced ANSI standards are written specifically for use in the design and construction of utility structures.

The ANSI O5 committee produces and maintains the only nationally recognized standards for the specification of wood products to be used in electric utility and communication construction. These standards are widely used by electric utility and communication companies throughout the industry (including those in California, as currently permitted by the provisions of GO 95 [ref. 48.1(c)]). These standards have been heavily vetted by industry users throughout the U.S. and have been adopted for use by both the National Electrical Safety Code (NESC) and the Rural Utilities Service (RUS) specifications in establishing wood material strengths for line design. The revisions of each of the ANSI standards cited in the MAP were selected because they coincide with those referenced in the current edition of the NESC. This is believed to be a good starting point so that in the future the GO 95 Rules Committee can leverage the vetting process used by NESC committee members when considering adopting more recent revisions of the referenced standards.

Except for details regarding application of safety factors, this PRC is identical to MAP 6B proposed by SED. Section IV of GO 95 is based on the working strength design method (also known as working stress design and allowable stress design). This method provides safety margin in line designs by requiring that the strengths of materials be divided by safety factors. This MAP eliminates confusion regarding the proper application of safety factors by including instructions stating specifically that allowable stresses shall be derived by dividing strength properties by safety factors. This MAP provides the added benefit of making the instructions in Rule 48.1 regarding the application of safety factors consistent with those already in the current versions of Rules 48.2 (see MAP 7A for additional information), 48.4 (see MAP 9A for additional information) and 48.7.

This MAP will improve fire safety by ensuring consistency among all interested parties in establishing wood strength values to be used in design and analysis.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This MAP will help to clarify and modernize GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This MAP will modify GO 95 to reflect modern materials and/or practices. It will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, the proposed revision will reduce the risk that affected facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

The impact on costs, if any, is anticipated to be insignificant.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies and modernizes GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This MAP clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

CIP Coalition

This proposal will revise Rule 48.1 to reflect modern materials and practices. It will also clarify the manner in which safety factors should be applied to "Wood" in engineering and constructing electric utility and CIP facilities. It will do so by revising Rule 48.1 in a manner consistent with existing Rules 48.2 regarding "Steel," 48.4 regarding "Other Structural Materials" and the sample calculations contained in Appendix F, Part 1, Typical Problems. The revisions proposed in MAP 6A are also be consistent with Rule 48 as proposed to be revised by MAP 5A and MAP 5B.

The CIP Coalition supports this proposal since it properly reflects modern materials and practices and will help ensure that requirements for the design and construction of electric utility and CIP facilities are clear and can be understood and enforced in a uniform and consistent manner.

(b) Comments in Opposition

SED

Except for details regarding application of safety factors, this MAP is identical to MAP 6B proposed by SED. Section IV of GO 95 is based on the working strength design method (also known as working stress design and allowable stress design). However, this MAP would remove the historical reference of the phrase "in conjunction with" and change it to "divided by safety factors". This MAP is overly prescriptive in specifying how a company must apply safety factors and does not allow an engineer to apply it on the load side if they so choose; whereas, MAP 6B allows the engineer a choice in how to apply the safety factor.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T	X			
BVES	X			
CAL-FIRE		X		
CALPECO	X			
CCTA	X			
CMUA	X			
COMCAST	X			
COX	X			
SED (CPSD)			X	
CROWN CASTLE	X			
CTIA	X			
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz			X	
IBEW 1245				X
LA COUNTY			X	
LADWP	X			
MGRA			X	
MID	X			
PACIFICORP	X			
PG&E	X			
SCE	X			
SDG&E	X			
SMALL LECS	X			
SMUD	X			
SPRINT NEXTEL	X			
SUNESYS	X			
SUREWEST	X			
TW CABLE	X			
T-MOBILE	X			
TURN				X
TW TELECOM				X
VERIZON	X			

MAP 6B – RULE 48 – WOOD

Rule 48.1 Proposal by SED

(1) Current Rule

48.1 Wood

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.

Table 5 Wood Strengths

Species	Modulus of Rupture Bending (a)	
	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	6,800 (c) lbs per square inch
Fir, white or red, local	4,700 lbs per square inch	5,600 lbs per square inch
Pine, southern yellow, dense	6,300 lbs per square inch	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.

(2) Strikeout/Redlined Proposed Changes

48.1 Wood

A. Natural Wood (Non Laminate)

~~Values used for moduli of rupture for wood in bending shall be, 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 specified in that standard. 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 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.~~

(3) Proposed Final

48.1 Wood

A. Natural Wood (Non Laminate)

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 specified in that standard. Table 5 contains a sample of some 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 in conjunction with the safety factors given in Rule 44 and the designated fiber strength specified in that standard.

Multiply the given allowable stresses 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	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

(4) Rationale

The wood strength values listed in Table 5 are archaic and are not supported by any currently published timber industry standard. Moreover, GO 95 does not currently provide for the use of laminated wood products in the design and construction of lines. This PRC advocates the removal of Table 5 and replacing it with references to the applicable American National Standards Institute, ANSI O5 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]. These standards are written specifically for use in the design and construction of utility structures. The ANSI O5 committee produces and maintains the only nationally recognized standards for the specification of wood products to be used in electric utility and communication construction. These standards are widely used by electric utility and communication companies throughout the industry (including those in California, as currently permitted by the provisions of GO 95 [ref. 48.1(c)]). These standards have been heavily vetted by industry users throughout the 48 U.S. and have been adopted for use by both the National Electrical Safety Code (NESC) and the Rural Utilities Service (RUS) specifications in establishing wood material strengths for line design.

The revisions of each of the ANSI standards cited in the proposed rule change were selected because they coincide with those referenced in the current edition of the NESC. This is believed to be a good starting point so that in the future the GO 95 Rules Committee can leverage the vetting process used by NESC committee members when considering adopting more recent revisions of the referenced standards.

The key difference between this MAP and the other MAP on this rule is the use of the phrase “in conjunction with” instead of revising the rule to state “divide by”. The reason for keeping the phrase “in conjunction with” is that historically the GO uses this phrase when the minimum required safety factor is above one (unity). Furthermore, using the phrase “in conjunction with” does not dictate how or when an engineer should apply the Safety Factor. Lastly, use of the phrase “in conjunction with” is consistent with the MAPs for Rules 48, 48.2, 48.4 and 48.5 as proposed by SED.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIPs and electric utilities.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will modernize GO 95 to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern materials and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facility will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how the costs will be recovered from customers.

See above.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because simplifies GO 95 rules, modernizes the rules and advances clarity. It will revise safety rules GO 95 to reflect modern materials and practices.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

CIP Coalition

This proposal is an alternative to MAP 6A. Among other distinctions, it would effectively reject the clarification of Rule 48.1 proposed in MAP 6A explaining how safety factors should be applied to "Wood" and would leave the existing rule subject to potentially conflicting interpretations.

The CIP Coalition opposes this proposal since it is inconsistent with the Commission's intent to revise Section IV of GO 95 to reflect modern materials and practices and to ensure that requirements for the design and construction of electric utility and CIP facilities are clear, unambiguous, and can be understood and enforced in a uniform and consistent manner.

Joint Utilities

The Joint Utilities (PG&E, SCE, SDG&E, PacifiCorp, CalPeco, BVES) oppose this MAP because it prolongs the material error(s) in Rule 48 and would compound those errors by

inserting a new term in other rules that expands the problem to those rules and adding even more ambiguity to GO 95 regarding how safety factors are to be applied when calculating allowable stresses. SED has formerly supported the term "multiplied by" in Rule 48 for stress calculations; now, it proposes the term "in conjunction with" for MAP 6B and the rest of SED's related MAPs, which state in various parts:

> "… allowable stresses…should be **derived in conjunction** with… safety factors specified in Table 4" **(emphasis added)**

The electric utility and communication company technical experts are in agreement that the meaning of "in conjunction with" is unclear and provides no direction on how to derive allowable stresses. Regardless, SED is now attempting to prop up MAP 5C by averring - "[f]urthermore, using the phrase 'in conjunction with' does not dictate how or when an engineer should apply the Safety Factor." In the Joint Utilities' view, the lack of specificity regarding how safety factors are to be applied is inconsistent with the design method currently applied by electric and communication companies where the strengths of materials are divided by safety factors.

Instead, MAP 6A (proposed by SDG&E and supported by the Joint Utilities) proposes significant and important revisions that enhance, modernize, and clarify existing Rule 48.1. The Joint Utilities believe the correct calculation and the correct (and clarifying) verbiage used to describe that calculation in these rules, is as follows:

"… allowable stresses…should be derived by dividing the designated fiber strength…by safety factors specified in Table 4" (emphasis added)

Because this and the following proposals seek to introduce unnecessarily ambiguous verbiage solely to support proposed MAP 5C which includes known and admitted technical errors; and because it is inconsistent with the objective of improving fire safety and adding clarity to GO 95 rules, this instant proposal MAP 6B (as well as MAPs 5C, 7B, 8B and 9B) should be rejected.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T			X	
BVES			X	
CAL-FIRE		X		
CALPECO			X	
CCTA			X	
CMUA			X	
COMCAST			X	
COX			X	
SED (CPSD)	X			
CROWN CASTLE			X	
CTIA			X	
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz		X		
IBEW 1245				X
LA COUNTY	X			
LADWP			X	
MGRA	X			
MID			X	
PACIFICORP			X	
PG&E			X	
SCE			X	
SDG&E			X	
SMALL LECS			X	
SMUD			X	
SPRINT NEXTEL			X	
SUNESYS			X	
SUREWEST			X	
TW CABLE			X	
T-MOBILE			X	
TURN				X
TW TELECOM				X
VERIZON			X	

MAP 7A – RULE 48.2 – STEEL

Rule 48.2 Proposal by San Diego Gas & Electric (SDG&E)

(1) Current Rule

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:

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

Where S_{max} = maximum allowable working stress, lbs per square inch

f_s = 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.

(2) Strikeout/Redlined Proposed Changes

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:~~

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

~~Where S_{max} = maximum allowable working stress, lbs per square inch~~

~~f_s = 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:

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

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, F_y, and specified minimum tensile stress, F_u, 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 F_y and F_u 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.

(3) Proposed Final

48.2 Steel

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:

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

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, F_y, and specified minimum tensile stress, F_u, 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 F_y and F_u 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.

(4) Rationale

This MAP will modify GO 95 to reflect modern materials and/or practices. The steel strength criteria set forth in GO 95 are archaic and incomplete. Since the adoption of the current language in GO 95 there have been significant advances in the development of appropriate criteria to be used in the design and analyses of steel structures used in the construction of lines. Specifically, the American Society of Civil Engineers (ASCE) has published two standards devoted exclusively to structures used for lines. These documents, ASCE 10-97, Design of Latticed Steel Transmission Structures, and ASCE 48-11, Design of Steel Transmission Pole Structures, provide the complete criteria needed for proper design of these two types of steel structures, including how material strengths are to be defined. Both were developed in accordance with American National Standards Institute (ANSI) protocols and are internationally

recognized and widely used by utility companies throughout the industry, including California utility companies.

The vast majority of steel structure design for lines would be governed by one of these two standards. However, this MAP also provides for some minimum criteria to be used for the very small number of structures that fall outside the scope of either of these standards. The basis for these criteria is another nationally recognized Specification published by the American Institute of Steel Construction (AISC), entitled Manual of Steel Construction, Allowable Stress Design, 9th Edition. Each revision of all three of the above reference standards is heavily vetted by users, producers, regulators and academics alike.

The current rule clearly describes the proper application of safety factors, i.e., the strength property of interest "…shall be divided by the safety factor to determine the maximum allowable working stress." Therefore, it was not necessary to include clarification in this MAP regarding the proper application of safety factors as was done for MAP 6A; the instructions in the current rule indicating allowable stresses are to be determined by dividing pertinent strength properties by the safety factor are maintained in this MAP. (See MAP 6A for additional information regarding application of safety factors.)

This MAP will improve fire safety by ensuring consistency among all interested parties in establishing the strength criteria to be used in design and analyses of steel structures used in line construction.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This MAP will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This MAP will modify GO 95 to reflect modern materials and/or practices. By doing so, it will aid in ensuring consistency in compliance which in turn will increase the safety

and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, the proposed revision will reduce the risk that affected facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

The impact on costs, if any, is anticipated to be insignificant.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity. It will bring GO 95 into conformance and up-to-date with other prevailing national standards applicable to steel structures.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This MAP clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

SED

Except for details regarding application of safety factors, this MAP is identical to MAP 7B proposed by SED. This MAP would use the phrase "divided by safety factors" instead of the phrase "in conjunction with safety factors". The phrase "divided by safety factors" was commonly used in the GO when the safety factor could be reduced to unity (or 1), which the safety factor of steel can be reduced to. In performing a calculation of dividing by "1" or multiplying by "1" the resultant is the original number. During the workshops there were lengthy discussions about increasing the safety factors of steel to not allow it to reach unity for certain classes of structures. However, that proposal was deferred to Track 3. Accordingly MAP 7B, below, would keep the historical nomenclature ("in conjunction with safety factors") for materials that have safety factors above unity. Furthermore, this MAP is overly prescriptive in specifying how a company must apply safety factors and does not allow an engineer to apply it on the load side if they so choose; whereas, MAP 7B allows the engineer a choice.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T	X			
BVES	X			
CAL-FIRE		X		
CALPECO	X			
CCTA	X			
CMUA	X			
COMCAST	X			
COX	X			
SED (CPSD)			X	
CROWN CASTLE	X			
CTIA	X			
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz			X	
IBEW 1245				X
LA COUNTY			X	
LADWP	X			
MGRA			X	
MID	X			
PACIFICORP	X			
PG&E	X			
SCE	X			
SDG&E	X			
SMALL LECS	X			
SMUD	X			
SPRINT NEXTEL	X			
SUNESYS	X			
SUREWEST	X			
TW CABLE	X			
T-MOBILE	X			
TURN				X
TW TELECOM				X
VERIZON	X			

MAP 7B – RULE 48.2 – STEEL

Rule 48.2 Proposal by SED

(1) Current Rule

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:

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.

(2) Strikeout/Redlined Proposed Changes

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:~~

~~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:

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

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, F_y, and specified minimum tensile stress, F_u, 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 F_y and F_u 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.

(3) Proposed Final

48.2 Steel

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:

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

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, F_y, and specified minimum tensile stress, F_u, 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 F_y and F_u 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.

(4) Rationale

The steel strength criteria set forth in GO 95 are archaic and incomplete. Since the adoption of the current language in GO 95 there have been significant advances in the development of appropriate criteria to be used in the design and analyses of steel structures used in the construction of lines. Specifically, the American Society of Civil Engineers (ASCE) has published two standards devoted exclusively to structures used for lines. These documents, ASCE 10-97, Design of Latticed Steel Transmission Structures, and ASCE 48-11, Design of Steel Transmission Pole Structures, provide the complete criteria needed for proper design of these two types of steel structures, including how material strengths are to be defined. Both were developed in accordance with American National Standards Institute (ANSI) protocols and are internationally recognized and widely used by utility companies throughout the industry, including California utility companies.

The vast majority of steel structure design for lines would be governed by one of these two standards. However, this proposed rule change also provides for some minimum criteria to be used for the very small number of structures that fall outside the scope of either of these standards. The basis for these criteria is another nationally recognized Specification published by the American Institute of Steel Construction (AISC), entitled Manual of Steel Construction, Allowable Stress Design, 9th Edition. Each revision of all three of the above reference standards is heavily vetted by users, producers, regulators and academics alike.

This PRC will improve fire safety by ensuring consistency among all interested parties in establishing the strength criteria to be used in design and analyses of steel structures used in line construction.

The key difference between this MAP and the other MAP on this rule is the use of the phrase "in conjunction with" instead of revising the rule to state "divide by". The reason for keeping the phrase "in conjunction with" is that historically the GO uses this phrase when the minimum required safety factor is above one (unity). Furthermore, using the phrase "in conjunction with" does not dictate how or when an engineer should apply the Safety Factor. Lastly, use of the phrase "in conjunction with" is consistent with the MAPs for Rules 48, 48.1, 48.4 and 48.5 as proposed by SED.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIPs and electric utilities.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will modernize GO 95 to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facility will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how the costs will be recovered from customers.

See above.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because simplifies GO 95 rules, modernizes the rules and advances clarity. It will revise safety rules in GO 95 to reflect modern materials and practices.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

CIP Coalition

This proposal will make a number of revisions to Rule 48.2 regarding "Steel." One of the changes is to delete the provisions of the existing rule that explain how safety factors shall be applied to "Steel." The existing rule currently correctly explains how safety factors shall be applied and does so in a manner consistent with other provisions of GO 95, including present Rule 48.4 regarding "Other Structural Materials" and the sample calculations contained in Appendix F, Part 1, Typical Problems. The existing rule is also consistent with Rule 48 as proposed to be revised by MAP 5A and MAP 5B.

The CIP Coalition opposes this proposal since it is inconsistent with the Commission's intent to revise Section IV of GO 95 to reflect modern materials and practices and to ensure that

requirements for the design and construction of electric utility and CIP facilities are clear, unambiguous, and can be understood and enforced in a uniform and consistent manner. This proposal will therefore do the exact opposite of the intent of the Commission, introducing ambiguity and confusion into Rule 48.2 where none now exists.

Joint Utilities

The Joint Utilities (PG&E, SCE, SDG&E, PacifiCorp, CalPeco, BVES) oppose this proposal because it would introduce unnecessarily ambiguous verbiage describing how safety factors are to be applied when calculating allowable stresses. Alternatively, MAP 7A (proposed by SDG&E and supported by the Joint Utilities) proposes significant and important revisions that enhance and modernize existing Rule 48.2. SED has formerly supported the term "multiplied by" in Rule 48 for stress calculations; now, it proposes the term "in conjunction with" for MAP 7B and the rest of SED's related MAPs, which state in various parts:

> "… allowable stresses…should be derived **in conjunction with**…
> safety factors specified in Table 4" **(emphasis added)**

Although this instant proposal is nearly identical to MAP 7A, here SED seeks to introduce ambiguous instructions regarding the application of safety factors. The electric utility and communication company technical experts are in agreement that the meaning of "in conjunction with" is unclear and MAP 7A (as proposed by SDG&E) would eliminate this ambiguity. Regardless, SED is now attempting to prop up MAP 5C by averring - "[f]urthermore, using the phrase 'in conjunction with' does not dictate how or when an engineer should apply the Safety Factor." In the Joint Utilities' view, the lack of specificity regarding how safety factors are to be applied is inconsistent with the design method currently applied by electric and communication companies where the strengths of materials are divided by safety factors.

Because this proposal seeks to introduce unnecessarily ambiguous verbiage solely to support proposed MAP 5C which includes known and admitted technical errors; and because it is inconsistent with the objective of improving fire safety and adding clarity to GO 95 rules, this instant proposal MAP 7B (as well as MAPs 5C, 6B, 8B and 9B) should be rejected.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T			X	
BVES			X	
CAL-FIRE		X		
CALPECO			X	
CCTA			X	
CMUA			X	
COMCAST			X	
COX			X	
SED (CPSD)	X			
CROWN CASTLE			X	
CTIA			X	
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz		X		
IBEW 1245				X
LA COUNTY	X			
LADWP			X	
MGRA	X			
MID			X	
PACIFICORP			X	
PG&E			X	
SCE			X	
SDG&E			X	
SMALL LECS			X	
SMUD			X	
SPRINT NEXTEL			X	
SUNESYS			X	
SUREWEST			X	
TW CABLE			X	
T-MOBILE			X	
TURN				X
TW TELECOM				X
VERIZON			X	

MAP 8A – RULE 48.4 – FIBER-REINFORCED POLYMER

Rule 48.4 Proposal by CIP Coalition

(1) Current Rule

No Current Rule

(2) Strikeout/Redlined Proposed Changes

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.

(3) Proposed Final

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.

(4) Rationale

MAP 8A (*formerly AP 9A)* adds a new rule 48.4 that provides how the safety factors for fiber reinforced polymer (FRP) are to be applied. A specified objective of Phase 3 is to consider revisions to Section IV of GO 95 to reflect modern materials and practices, with the goal of improving fire safety. Fiber-reinforced polymer (FRP) is the most obvious modern material not specifically captured in Section IV of GO 95. FRP, used for poles or crossarms, is a recognized material that is the basis of ASCE 104 Recommended Practice for Fiber-Reinforced Polymer Products for Overhead Utility Line Structures, and is explicitly included in recent editions of the National Electrical Safety Code (e.g., 2007 and 2012 editions). The safety factors for FRP, as provided in Rule 44, should be the same as those determined for other engineered materials, such as metal (steel). ASCE 111, Reliability Based Design of Utility Pole Structures, provides information on methods for determining the strength of FRP and is incorporated in this MAP.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above. This PRC would be inserted ahead of existing Rule 48.4 (Other Structural Materials, see also PRC 10)

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

This proposed change is consistent with the goal to revise Section IV of GO 95 to reflect modern materials and practices,

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern materials and/or practices. By doing such it will aid in ensuring consistency in compliance, which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facility will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

The adoption of this rule should not, in and of itself, cause any costs since the rule merely explains how safety factors for fiber reinforced polymer are to be applied. The rule does not require any CIP or utility to use fiber reinforced polymer.

- Whether and how the costs will be recovered from customers.

Any costs (except for FRP-specific materials and labor costs) incurred as a result of adoption of this proposal are expected to be minimal. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Whether and if so how the costs will be shared among individual electric utilities and CIPs will depend parties' ownership interests in the poles and the relevant terms in the applicable joint pole agreements or pole license agreements.

- Why it is in the public interest to adopt the PRC.

See Rationale.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

SED

Except for details regarding application of safety factors, this MAP is identical to MAP 8B proposed by SED. This MAP, however, would use the phrase "divided by safety factors" instead of the phrase "in conjunction with safety factors" as proposed by SED. The phrase "divided by safety factors" was commonly used in the GO when the safety factor could be reduced to unity (or 1), which the safety factor of steel can be reduced to. In performing a calculation of dividing by "1" or multiplying by "1" the resultant is the original number. During the workshops there were lengthy discussions about increasing the safety factors of steel to not allow it to reach unity for certain class of structures. However, that proposal was deferred to Track 3. Accordingly, MAP 8B, below, would keep the historical nomenclature ("in conjunction with safety factors") for materials that have safety factors above unity. Furthermore, this MAP is overly prescriptive in specifying how a company must apply safety factors and does not allow an engineer to apply it on the load side if they so choose; whereas, MAP 8B allows the engineer a choice.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T	X			
BVES	X			
CAL-FIRE		X		
CALPECO	X			
CCTA	X			
CMUA	X			
COMCAST	X			
COX	X			
SED (CPSD)			X	
CROWN CASTLE	X			
CTIA	X			
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz			X	
IBEW 1245				X
LA COUNTY			X	
LADWP	X			
MGRA			X	
MID	X			
PACIFICORP	X			
PG&E	X			
SCE	X			
SDG&E	X			
SMALL LECS	X			
SMUD	X			
SPRINT NEXTEL	X			
SUNESYS	X			
SUREWEST	X			
TW CABLE	X			
T-MOBILE	X			
TURN				X
TW TELECOM				X
VERIZON	X			

MAP 8B – RULE 48.4 – FIBER-REINFORCED POLYMER

Rule 48.4 Proposal by SED

(1) Current Rule

No Current Rule.

(2) Strikeout/Redlined Proposed Changes

48.4 Fiber-Reinforced Polymer

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 stress.

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 obtain the maximum allowable working stress or load capacity. 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 stress.

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

(3) Proposed Final

48.4 Fiber-Reinforced Polymer

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 stress.

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 obtain the maximum allowable working stress or load capacity. 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 stress.

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

(4) Rationale

Fiber-reinforced polymer (FRP), including for poles or crossarms, is a recognized material that is the basis of ASCE 104 Recommended Practice for Fiber-Reinforced Polymer Products for Overhead Utility Lines, and is explicitly included in recent editions of the National Electrical Safety Code (e.g., 2007 edition). The safety factors for FRP, as provided in Rule 44, should be the same as determined for other engineered materials, such as metal (steel, etc.).

The key difference between this MAP and the other MAP on this rule is the use of the phrase "in conjunction with" instead of revising the rule to state "divide by". The reason for keeping the phrase "in conjunction with" is that historically the GO uses this phrase when the minimum required safety factor is above one (unity). Furthermore, using the phrase "in conjunction with" does not dictate how or when an engineer should apply the Safety Factor. Lastly, use of the phrase "in conjunction with" is consistent with the MAPs for Rules 48, 48.1, 48.2 and 48.5 as proposed by SED.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIPs and electric utilities.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will modernize GO 95 to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern materials and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facility will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how the costs will be recovered from customers.

See above.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because simplifies GO 95 rules, modernizes the rules and advances clarity. It will revise safety rules GO 95 to reflect modern materials and practices.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

CIP Coalition

This proposal is an alternative to MAP 8A. It will revise GO 95 to add a new subsection, new rule 48.4 specifying material strength requirements for "Fiber Reinforced Polymer", but will do so in a significantly different manner from MAP 8A. MAP 8A will, among other things, explain the manner in which safety factors should be applied to "Fiber Reinforced Polymer" in engineering and constructing electric utility and CIP facilities and will do so in a manner consistent with existing Rules 48.2 regarding "Steel," 48.4 regarding "Other Structural Materials", the sample calculations contained in Appendix F, Part 1, Typical Problems, and Rule 48 as proposed to be revised by MAP 5A and MAP 5B. MAP 8B effectively deletes the explanation of how safety factors should be applied from MAP 8A and includes no explanation of how safety factors should be applied to "Fiber Reinforced Polymer." It's failure to do so will thereby introducing unnecessary and inappropriate ambiguity and confusion into the proposed new rule.

The CIP Coalition opposes this proposal since it is inconsistent with the Commission's intent to revise Section IV of GO 95 to reflect modern materials and practices and to ensure that requirements for the design and construction of electric utility and CIP facilities are clear, unambiguous, and can be understood and enforced in a uniform and consistent manner.

Joint Utilities

The Joint Utilities (PG&E, SCE, SDG&E, PacifiCorp, CalPeco, BVES) oppose this proposal because it would introduce unnecessarily ambiguous verbiage describing how safety factors are to be applied when calculating allowable stresses. Alternatively, MAP 8A (proposed by the CIP Coalition and supported by the Joint Utilities) proposes significant and important revisions that enhance and modernize GO 95 by adding new Rule 48.4. SED has formerly supported the term "multiplied by" in Rule 48 for stress calculations; now, it proposes the term "in conjunction with" for MAP 8B and the rest of SED's related MAPs, which state in various parts:

> "… allowable stresses…should be derived **in conjunction with**…
> safety factors specified in Table 4" **(emphasis added)**

Although this instant proposal is nearly identical to MAP 8A, here SED seeks to introduce ambiguous instructions regarding the application of safety factors. The electric utility and communication company technical experts are in agreement that the meaning of "in conjunction with" is unclear and MAP 8A (as proposed by the CIP Coalition) would eliminate this ambiguity. Regardless, SED is now attempting to prop up MAP 5C by averring - "[f]urthermore, using the phrase 'in conjunction with' does not dictate how or when an engineer should apply the Safety Factor." In the Joint Utilities' view, the lack of specificity regarding how safety factors are to be applied is inconsistent with the design method currently applied by electric and communication companies where the strengths of materials are divided by safety factors.

Because this proposal seeks to introduce unnecessarily ambiguous verbiage solely to support proposed MAP 5C which includes known and admitted technical errors; and because it is

inconsistent with the objective of improving fire safety and adding clarity to GO 95 rules, this instant proposal MAP 8B (as well as MAPs 5C, 6B, 7B and 9B) should be rejected.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T			X	
BVES			X	
CAL-FIRE		X		
CALPECO			X	
CCTA			X	
CMUA			X	
COMCAST			X	
COX			X	
SED (CPSD)	X			
CROWN CASTLE			X	
CTIA			X	
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz		X		
IBEW 1245				X
LA COUNTY	X			
LADWP			X	
MGRA	X			
MID			X	
PACIFICORP			X	
PG&E			X	
SCE			X	
SDG&E			X	
SMALL LECS			X	
SMUD			X	
SPRINT NEXTEL			X	
SUNESYS			X	
SUREWEST			X	
TW CABLE			X	
T-MOBILE			X	
TURN				X
TW TELECOM				X
VERIZON			X	

MAP 9A – RULE 48.5 – OTHER ENGINEERED MATERIALS (CURRENTLY RULE 48.4 OTHER STRUCTURAL MATERIALS)

Rule 48.5 -- Proposal by San Diego Gas and Electric Company (SDG&E)

(1) Current Rule

48.4 Other Structural Materials

For other structural materials, the safety factor specified in Rule 44 shall be applied as follows:

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

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, considering yield 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.

(2) Strikeout/Redlined Proposed Changes

48.45 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.

(3) Proposed Final

48.5 Other Engineered Materials

For other engineered materials, the safety factor specified in Rule 44 shall be applied as follows:

Tension: The tensile strength of the material 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 compressive strength of the material used shall be divided by the safety factor specified in Rule 44 to obtain the allowable working stress. 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.

Shear: The 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.

(4) Rationale

This MAP will modify GO 95 to reflect modern materials and/or practices. The current section of GO 95 covering "Other Structural Materials" is both inappropriate and overly broad. First, the title suggests that this section covers all materials not otherwise covered in the previous sections and, second, it suggests that these materials all have a published "yield strength" value. This MAP advocates both a change in title to limit its scope as well as redefining the basis for establishing strength values. Renumbering of the rule is also proposed to accommodate other proposed changes to Rule 48.

The proposed title change would limit the application of this section to "Engineered Materials", meaning those materials for which there are vetted published criteria that can be used for establishing material strengths. Addition of a footnote is also proposed providing guidance regarding how such values may be determined based on criteria set forth in the American Society of Civil Engineers (ASCE) publication, ASCE 111-2006, Reliability-Based Design of Utility Pole Structures, Section 2.6.2.

This MAP also recognizes that not all materials have a "yield strength" value. Yield Strength values are generally associated only with metals. There are other types of engineered materials, such as most composite materials, where the term, "yield strength", does not apply. The proposed language of the section replaces the term "yield strength" with the terms "tensile", "compression" or "shear" strength as appropriate. However, the provision remains that when a material does have a published yield strength value, that value shall be used when establishing the maximum allowable working stresses.

The current rule already clearly describes the proper application of safety factors, i.e., "…strength of the material shall be divided by the safety factor specified in Rule 44 to determine the maximum allowable working stress." Therefore, it was not necessary to include clarification in this MAP regarding the proper application of safety factors as was done for MAP 6A; the instructions in the current rule indicating allowable stresses are to be determined by dividing pertinent strength properties by the safety factor are maintained in this MAP. (See MAP 6A for additional information regarding application of safety factors.)

This MAP will improve fire safety by ensuring consistency and correctness among all interested parties in establishing the strength criteria to be used in design and analysis of structural members and their connections made using other engineered materials.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

Electric utilities and CIPs subject to the Commission's jurisdiction.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This MAP will help to clarify GO 95.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This MAP will modify GO 95 to reflect modern materials and/or practices. By doing so, it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, the proposed revision will reduce the risk that affected facilities will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

The impact on costs, if any, is anticipated to be insignificant.

- Whether and how the costs will be recovered from customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The proposed revision simplifies GO 95 rules and advances clarity.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This MAP clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

SED

Except for details regarding application of safety factors, this MAP is identical to MAP 9B proposed by SED. This MAP would use the phrase "divided by safety factors" instead of the phrase "in conjunction with safety factors" proposed by SED. The phrase "divided by safety

factors" was commonly used in the GO when the safety factor could be reduced to unity (or 1), which the safety factor of steel can be reduced to. In performing a calculation of dividing by "1" or multiplying by "1" the resultant is the original number. During the workshops there were lengthy discussions about increasing the safety factors of steel to not allow it to reach unity for certain classes of structures. However, that proposal was deferred to Track 3. Accordingly MAP 9B, below, would keep the historical nomenclature ("in conjunction with safety factors") for materials that have safety factors above unity. Furthermore, this MAP is overly prescriptive in specifying how a company must apply safety factors and does not allow an engineer to apply it on the load side if they so choose; whereas, MAP 9B allows the engineer a choice.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T	X			
BVES	X			
CAL-FIRE		X		
CALPECO	X			
CCTA	X			
CMUA	X			
COMCAST	X			
COX	X			
SED (CPSD)			X	
CROWN CASTLE	X			
CTIA	X			
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz			X	
IBEW 1245				X
LA COUNTY			X	
LADWP	X			
MGRA			X	
MID	X			
PACIFICORP	X			
PG&E	X			
SCE	X			
SDG&E	X			
SMALL LECS	X			
SMUD	X			
SPRINT NEXTEL	X			
SUNESYS	X			
SUREWEST	X			
TW CABLE	X			
T-MOBILE	X			
TURN				X
TW TELECOM				X
VERIZON	X			

MAP 9B – RULE 48.5 – OTHER ENGINEERED MATERIALS (CURRENTLY RULE 48.4 OTHER STRUCTURAL MATERIALS)

RULE 48.5 -- PROPOSAL BY SED

(1) Current Rule

48.4 Other Structural Materials

For other structural materials, the safety factor specified in Rule 44 shall be applied as follows:

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

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, considering yield 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.

(2) Strikeout/Redlined Proposed Changes

Rule 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.

(3) Proposed Final

Rule 48.5 Other Engineered Materials

Tension: The tensile 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. 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 of the material used shall be derived in conjunction with the safety factors given in Rule 44 to obtain the maximum allowable working stress. 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.

Shear: The shear 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.

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

(4) Rationale

The current section of GO 95 covering "Other Structural Materials" is both inappropriate and overly broad. First, the title suggests that this section covers all materials not otherwise covered in the previous sections and, second, it suggests that these materials all have a published "yield strength" value. This PRC advocates both a change in title to limit its scope as well as redefining the basis for establishing strength values. The proposed title change would limit the application of this section to "Engineered Materials", meaning those materials for which there are vetted published criteria that can be used for establishing material strengths.

This PRC also recognizes that not all materials have a "yield strength" value. Yield strength values are generally associated only with metals. There are other types of engineered materials, such as most composite materials, where the term, "yield strength", does not apply. The proposed language of the section replaces the term "yield strength" with the terms ultimate tensile, compression or shear strength as appropriate. However, the provision remains that when a material does have a published yield strength value, that value shall be used when establishing the maximum allowable working stresses.

This PRC will improve fire safety by ensuring consistency and correctness among all interested parties in establishing the strength criteria to be used in design and analyses of structural members and their connections made using other engineered materials.

The key difference between this MAP and the other MAP on this rule is the use of the phrase "in conjunction with" instead of revising the rule to state "divide by". The reason for keeping the phrase "in conjunction with" is that historically the GO uses this phrase when the minimum required safety factor is above one (unity). Furthermore, using the phrase "in conjunction with" does not dictate how or when an engineer should apply the Safety Factor. Lastly, use of the phrase "in conjunction with" is consistent with the MAPs for Rules 48, 48.1, 48.2 and 48.4 as proposed by SED.

(5) Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This PRC will affect all CIPs and electric utilities.

- The current text of the affected GO(s), if any.

See (1) above.

- New and/or revised text for the affected GO(s), if applicable, showing (i) proposed revisions in strikeout/underline form, and (ii) the final proposed rule.

See (2) and (3) above.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

See Rationale. This PRC will modernize GO 95 to reflect modern materials and practices.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale. This PRC will modify GO 95 to reflect modern material and/or practices. By doing such it will aid in ensuring consistency in compliance which in turn will increase the safety and reliability of the facilities impacted by the changed rule. More reliable facilities are less prone to failure and, thereby, reduce the risk that the facility will create a fire hazard.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

Any costs incurred as a result of adoption of this proposal are expected to be insignificant. With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding. Companies that are not rate-of-return regulated may recover costs in any legally permissible manner, including through line-item charges or increased fees for services.

- Whether and how the costs will be recovered from customers.

See above.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

This PRC is in the public interest because simplifies GO 95 rules, modernizes the rules and advances clarity. It will revise safety rules GO 95 to reflect modern materials and practices.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This PRC clarifies an existing GO 95 rule, which currently complements and poses no conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

(6) Comments

(a) Comments in Support

None.

(b) Comments in Opposition

CIP Coalition

This proposal will make a number of revisions to existing Rule 48.4 (renumbered as Rule 48.5) regarding "Other Structural Materials." One of the changes is to delete the existing provisions of the rule that explains how safety factors shall be applied. The existing rule currently correctly explains how safety factors shall be applied and does so in a manner consistent with other provisions of GO 95, including Rule 48.2 regarding "Steel" and the sample calculations contained in Appendix F, Part 1, Typical Problems. The existing rule is also consistent with Rule 48 as proposed to be revised by MAP 5A and MAP 5B.

The CIP Coalition opposes this proposal since it is inconsistent with the Commission's intent to revise Section IV of GO 95 to reflect modern materials and practices and to ensure that

requirements for the design and construction of electric utility and CIP facilities are clear, unambiguous, and can be understood and enforced in a uniform and consistent manner. This proposal will do the exact opposite of the intent of the Commission, introducing ambiguity and confusion into new Rule 48.5 (existing Rule 48.4) where none now exists.

Joint Utilities

The Joint Utilities (PG&E, SCE, SDG&E, PacifiCorp, CalPeco, BVES) oppose this proposal because it would introduce unnecessarily ambiguous verbiage describing how safety factors are to be applied when calculating allowable stresses. Alternatively, MAP 9A (proposed by SDG&E and supported by the Joint Utilities) proposes significant and important revisions that enhance and modernize existing, renumbered Rule 48.5. SED has formerly supported the term "multiplied by" in Rule 48 for stress calculations; now, it proposes the term "in conjunction with" for MAP 9B and the rest of SED's related MAPs, which state in various parts:

> "… allowable stresses…should be derived **in conjunction with**…
> safety factors specified in Table 4" **(emphasis added)**

Although this instant proposal is nearly identical to MAP 9A, here SED seeks to introduce ambiguous instructions regarding the application of safety factors. The electric utility and communication company technical experts are in agreement that the meaning of "in conjunction with" is unclear and MAP 9A (as proposed by SDG&E) would eliminate this ambiguity. Regardless, SED is now attempting to prop up MAP 5C by averring - "[f]urthermore, using the phrase 'in conjunction with' does not dictate how or when an engineer should apply the Safety Factor." In the Joint Utilities' view, the lack of specificity regarding how safety factors are to be applied is inconsistent with the design method currently applied by electric and communication companies where the strengths of materials are divided by safety factors.

Because this proposal seeks to introduce unnecessarily ambiguous verbiage solely to support proposed MAP 5C which includes known and admitted technical errors; and because it is inconsistent with the objective of improving fire safety and adding clarity to GO 95 rules, this instant proposal MAP 9B (as well as MAPs 5C, 6B, 7B and 8B) should be rejected.

(7) Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T			X	
BVES			X	
CAL-FIRE		X		
CALPECO			X	
CCTA			X	
CMUA			X	
COMCAST			X	
COX			X	
SED (CPSD)	X			
CROWN CASTLE			X	
CTIA			X	
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz		X		
IBEW 1245				X
LA COUNTY	X			
LADWP			X	
MGRA	X			
MID			X	
PACIFICORP			X	
PG&E			X	
SCE			X	
SDG&E			X	
SMALL LECS			X	
SMUD			X	
SPRINT NEXTEL			X	
SUNESYS			X	
SUREWEST			X	
TW CABLE			X	
T-MOBILE			X	
TURN				X
TW TELECOM				X
VERIZON			X	

APPENDIX C – IOU FIRE INCIDENT DATA COLLECTION PLAN

Fire Incident Data Collection Plan

The attached proposal contains a plan for investor-owned electric utilities (IOUs) to collect and report data to the Safety and Enforcement Division (SED) regarding power-line fires, and for SED to identify and assess systemic fire-safety risks associated with overhead power-line facilities and aerial communications facilities in close proximity to power lines. The proposal contains a data template to be used by the IOUs to record and submit data to SED, as well as a set of principles governing the collection and submission of data. The proposal also sets forth how SED intends to analyze the data and formulate cost-effective measures to reduce systemic fire risks. The Fire Incident Data Collection Plan 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.

1. History of the Fire Incident Data Collection Plan

In Phase 2 of this proceeding, SED (then the Consumer Protection and Safety Division) and the Mussey Grade Road Alliance (MGRA) jointly offered a proposal requiring each electric IOU to collect and report information on all fire incidents attributable to its overhead power lines.

In the Phase 2 Decision, D.12-01-032, the Commission found that (p. 132):

> [R]equiring electric IOUs to report information on power-line fires would be very useful in formulating fire prevention measures and gauging the effectiveness of the adopted measures.
>
> The collection and reporting of data is a prerequisite for any serious program of sustained and cost-effective fire-safety improvement.[1]

However, the Commission further found that there was no firm plan for using the data. The Commission opened Phase 3 of this proceeding so that parties could, among other things, jointly develop a plan for SED to collect data on power-line fires from the electric IOUs, analyze the data, and use this information to formulate measures to reduce the number of fires ignited by

[1] D.12-01-032, *mimeo*, at p. 132.

power lines.[2]

Pursuant to the Commission's direction, parties participated in Technical Panel 2 workshops in order to develop a consensus fire data collection plan. During the course of the panel meetings, the parties did not reach consensus on a proposal. While the panel did not reach full consensus, the panel did reach agreement on portions of the fire data collection proposal. The proposal was presented in Technical Panel 2 Report, filed on October 12, 2012. Comments and exceptions to the proposal were also submitted in this Report, as well as suggestions to modify the proposal. During the course of the all-party workshops, the proposal was further refined to address the concerns and suggestions of the parties.

2. Rationale

This PRC would require electric utilities to provide data to SED that would allow specific characteristics of power line fires to be identified and that could be used to formulate future fire prevention strategies. The reduction of severe fires depends on the reduction in the number of ignitions. The distinction between "minor" and "significant" incidents is artificial, since the severity of an incident usually does not depend upon details of how an ignition occurs, but rather on wind, humidity, and vegetation characteristics. Requiring electric utilities to collect data on fire incidents attributable or allegedly attributable to their power lines, whether minor or significant, could be used to develop strategies to avoid catastrophic fires. This data would provide a means to evaluate and understand the causal mechanisms leading to the large number of minor fires, which in turn will help to identify preventative measures that will reduce the chance of both major and minor fires. SED recently obtained funding to create and manage a database to help track safety audits and other safety-related incidents, and is now capable of developing the ability to receive, safely store, and analyze the data.

Large fires can occur when electrical equipment fails under hazardous weather conditions in areas rich in fuel. This data collection requirement aims to quantitatively identify causal mechanisms for ignition so that they can be addressed. SED's proposal contains the elements that SED believes will provide information that will be useful in identifying operational and/or environmental trends relevant to fire-related events and will ensure that this information is

[2] *Id*., at p. 133, Ordering Paragraph No. 8(v).

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.

SED believes this proposal constitutes a concrete plan to use the reported information. In addition, in response to concerns about potential costs and benefits of this data reporting requirement, SED plans to meet with all IOUs and other key stakeholders, including fire agencies, 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; and potential refinements to the data collection process.

3. Justification

- The specific electric utilities, CIPs, and others affected by the PRC.

This data collection rule would affect investor owned electric utilities, which are owners of electric transmission facilities or distribution facilities.

- The specific Track 1 goal and/or Track 2 goal addressed by the PRC and/or other objectives of the PRC.

The Phase 3 Scoping Memo charged Track 2 with 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.

This proposal requires IOUs to provide information about power line fires so that SED can identify specific fire threats, devise measures to prevent future fires, and evaluate the effectiveness of countermeasures.

The proposal requires SED to analyze the data it receives in order to determine operational and/or environmental trends. Analyzing the data might include activities such as cross referencing the data to weather data, conducting a statistical analysis of the data to identify trends in the data, meeting with IOUs to discuss SED's statistical review of the data, and meeting with fire agencies and 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.

In order to implement cost-effective measures, the proposal requires SED to engage in one or more of the following activities: conduct a cost-benefit analysis of mitigation measures with the IOUs, CIPs, and fire agencies; hold meetings with one or more IOUs to discuss operational changes; initiate a rulemaking at the Commission to address the trend identified by SED; and/or meet with CAL FIRE and other fire agencies. While SED may meet with the IOUs anytime to discuss the data, at a minimum the proposal requires SED to meet with each IOU within six (6) months of receiving three years of fire data to discuss the data and the analysis results.

- How the PRC reduces or otherwise addresses the fire hazard(s) and/or achieves other objectives.

See Rationale, above. The proposed rule is designed to obtain information about power line fires so that specific fire threats can be identified, and means of preventing these fires can be devised. There are two primary benefits to be achieved by the accumulation of fire data. The first is the avoidance of the costs, both human and economic, that arise from catastrophic wildland fires ignited by power lines. The second benefit to having available data is that it provides a metric that allows the effects of engineering or operational changes, such as those being proposed or implemented as part of this rulemaking, to be measured. This knowledge will help to identify the most cost-effective measures to enhance fire safety.

- The anticipated costs of the PRC, including, if available, costs incurred by investor owned utilities, POUs, CIPs, and customers.

At the all-party workshops, the electric IOUs presented preliminary, unverified cost estimates ranging from $40,000 to $300,000 for start-up costs to implement the data collection plan, and ongoing annual costs of $15,000 to $350,000 to maintain the plan.

Additionally, funding for development of the database which will be used to store and analyze this data has already been provided to SED.

Finally, there is a built-in mechanism in the proposal that has SED meeting with the IOUs and other stakeholders after the fifth year of submitting data in order to discuss, among other things, the costs and benefits associated with this requirement.

Further detailed comments addressing the costs and benefits of the proposed plan may be addressed in parties' briefs.

- Whether and how the costs will be recovered from customers.

With respect to any costs incurred, the rate-of-return regulated utilities are seeking authority to record and recover these costs in the same manner as was approved by the Commission in Phase 2 of this proceeding.

- Whether and how costs will be shared among electric utilities, CIPs, and others.

Not applicable.

- Why it is in the public interest to adopt the PRC.

The beneficial knowledge that the Commission, fire agencies and the public could gain from learning the number of fire incidents and location of fire incidents on a year-to-year basis would be very useful in measuring current fire risks and identifying safety improvements that might be applied by the utilities. Benefits also include enhancement of public safety and minimizing occurrence of fire ignition from electric power lines. Any reduction in power line fires under extreme weather conditions would have a significant positive impact on public safety and avoided losses. In the long run, data collection on fire incidents should prove economically beneficial as it would allow for the identification of ineffective fire prevention measures, so that these can be eliminated.

By collecting and identifying the causes of minor fires, it is possible for electrical utilities and the Commission to take proactive steps to eliminate common failure mechanisms. This will reduce the probability of ignition of major fires.

There is currently no other data set maintained by fire agencies, the CPUC, or utilities that provides specific causal and location information regarding fires started by electrical distribution or transmission equipment (including the NFIRS –National Fire Incident Reporting System – which lumps electrical fires into one category and does not contain reliable and specific information). Likewise, data accumulated by CAL FIRE is reliably obtained for fire sizes greater than 100 acres. Hence, adoption of this rule is the only measure that would allow utility fire causes to be rigorously identified and quantified. This will result in the development of

more effective measures to reduce the ignition of major fires associated with electric supply facilities.

- If the PRC applies to electric transmission, why the rule does not conflict with other federal or state regulations.

This proposal does not pose a conflict with existing federal or state regulations.

- Whether the PRC is exempt from CEQA and/or NEPA and, if so, why. Any assertion that CEQA and NEPA do not apply must cite the relevant statues and/or regulations where the exemption is listed. Conversely, any assertion that CEQA and/or NEPA do apply must (1) cite the relevant statues and/or regulations that show this, and (2) list the steps that need to occur under CEQA and/or NEPA before the PRC can be adopted.

This proposal is exempt from environmental review under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it is not a "project" under CEQA and will not have any potentially significant impact on the environment. NEPA does not apply because adoption of the proposed rule change does not constitute action by a federal agency within the meaning of 42 USC § 4332.

4. Record of Confirmation Vote

PARTIES	YES	NEUTRAL	NO	NOT PRESENT
AT&T	X			
BVES		X		
CAL-FIRE	X			
CALPECO	X			
CCTA	X			
CMUA		X		
COMCAST	X			
COX	X			
SED (CPSD)	X			
CROWN CASTLE	X			
CTIA	X			
DRA				X
EXTENET				X
FRONTIER				X
H. Laetz			X	
IBEW 1245				X
LA COUNTY	X			
LADWP		X		
MGRA	X			
MID		X		
PACIFICORP	X			
PG&E		X		
SCE	X			
SDG&E	X			
SMALL LECS	X			
SMUD	X			
SPRINT NEXTEL	X			
SUNESYS	X			
SUREWEST	X			
TW CABLE	X			
T-MOBILE				X
TURN				X
TW TELECOM				X
VERIZON	X			

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. Principles

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.[3]

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.[4]

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.[5]

[3] 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.

[4] The following fields would be excluded from a standard format: Notes, Facility Identification, Other Companies and Suppressing Entity.

[5] *See* CPUC Resolution E-4184, GO 112-E, GO 165.

4. Fire-related reporting requirements should be limited to events that meet the following criteria.[6]

   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.

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:

[6] Fires that caused damage to utility facilities and whose ignition is not associated with utility facilities are excluded from this reporting requirement.

Utility Name:	Name of utility reporting the event;
Date[7]**:**	Date the event started;
Time[8] [9]**:**	The time the event started;
Location[10]:	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[11]);
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[12] [13]**:**	Was there an outage involved in the event;

[7] The excel spreadsheet will change the date field to the following format MM/DD/YY if a valid date is entered.

[8] This field is only an estimate as in many cases the utility might not know the exact start time.

[9] 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.

[10] 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.

[11] For the purpose of this Data Collection Proposal, "Rural" and "Urban" shall be the same definitions as those contained in General Order 165.

[12] For the purpose of this Data Collection Proposal, list the first outage associated with the event if multiple outages were involved.

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;
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:[14]	**An Optional Field**, list additional information that could be useful when examining data.

[13] 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.

[14] 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]	[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					

APPENDIX D – PHASE 3 WORKSHOP PROTOCOLS

PROTOCOLS FOR R.08-11-005 WORKSHOPS: PHASE 3

1. PURPOSE OF WORKSHOP

The purpose of the workshops in R.08-11-005 is to collaboratively explore the proposed rule changes (PRCs) relating to GO 95, and other issues within the scope of Phase 3, and to the extent possible to agree on specific PRCs to be recommended for adoption by the Commission.

2. WORKSHOP REPORT

The final product of the workshop will be a written workshop report that documents the agreed-upon PRCs and -- if necessary -- alternative PRCs. The workshop report will be filed with the -Commission or otherwise made a part of the official record in this proceeding as directed by the assigned Administrative Law Judge (ALJ).

2.1 Each agreed-upon PRC and alternative PRC will include specific text proposed to be added, deleted or modified, and a statement of supporting rationale.

3. WORKSHOP PARTICIPANTS

Workshop "Participant" is defined as any representative of a party to this proceeding who participates in discussing one or more of the PRCs during one or more scheduled workshop meetings. A party may bring as many representatives to participate in the workshop as it deems necessary to address the issues. A primary contact/spokesperson for each party shall be designated for purposes of notices and document distribution.

4. WORKSHOP AGENDA

An agenda for each workshop meeting will be developed by the Participants starting at the beginning of the first meeting, and will be updated through the workshop meetings as agreed by the Participants. The agenda will specify the date, time, location and host /contact person for the meeting and will list the PRCs to be addressed at the meeting.

4.1 To the extent possible, PRCs requiring the presence of Participants with special qualifications or expertise are to be scheduled for discussion on the same or consecutive days.

4.2 The Participants may agree to defer a PRC if, during discussion, it becomes apparent that participants with special qualifications or expertise, not then present, are needed to adequately address the PRC.

4.3 A party represented by a single Participant may request that a PRC of particular interest to them not be addressed on a specific date if they cannot be present on that date. Such request should be made as soon as

the party's scheduling constraint becomes known to them, and all reasonable efforts shall be made to accommodate such requests.

5. DISCUSSION PRINCIPLES

5.1 The discussion of PRCs will be governed by the following general principles:

5.1.1 Describe the rationale for the PRC. Specific circumstances at issue in the OIIs pending before the Commission will not be considered.

5.1.2 Identify and understand the Participants' respective points of view, interests and desired outcomes relative to the PRC.

5.1.3 Obtain (to the extent feasible) data that Participants believe is necessary to understand the issues and make an informed decision on the PRC.

5.14 Address all interests insofar as possible.

5.2 During meetings, opportunities will be allowed for a brief ongoing evaluation of progress and process ("process checks").

6. DECISION MAKING PROCESS

6.1 Agreement should be sought utilizing the "levels of agreement" process:

6.1.1 Agreement is defined as no votes at Level 2.

6.1.2 Levels of agreement scale:

Level 1 - I support/can live with this PRC.

Level 2 - I do not support/cannot live with this PRC.

Level 3 - I abstain/am neutral.

6.1.3 Each party shall state a single level of agreement, regardless of how many Participants it has brought to the workshop meeting.

6.1.4 A "straw vote" to ascertain the level of support for, or opposition to, a PRC may be called for at any time and shall be held prior to any final vote.

6.1.5 Tentative working agreements may be reached on parts of complex PRCs, subject to final agreement on the entire PRC.

6.1.6 If no party gives the PRC a "2", the PRC is agreed upon as submitted. Otherwise the PRC is either:

6.1.6.1 Submitted to a smaller working group or Committee to refine outside of the workshop process to be brought back for later consideration;

6.1.6.2 Assigned to a Multiple Alternatives Process (MAP) in which one or more parties, individually or in small working groups, return to a later workshop meeting with alternative PRCs; or

6.1.7 If a PRC is assigned to a MAP but does not lead to agreement, the proponent(s) of each MAP alternative may submit their alternative(s), for a vote by workshop Participants. Each such alternative, together with the voting results and any statements of rationale Participants wish to provide regarding the alternative, will be included in the Workshop Report.

6.1.8 If a PRC or MAP alternative is not voted on by Participants or is withdrawn by its proponent(s) it will not be included in the Workshop Report.

6.2 Parties are responsible to have an informed Participant at each meeting who has authority to discuss the topics to be addressed in that meeting, and who will seek management input prior to each confirmation agenda in order to expedite the work of the workshop.

6.3 Any party that, without prior notice to the other parties, is absent from a meeting at which a PRC is agreed upon, is deemed to have abstained from the determination of levels of agreement, and has waived the opportunity to challenge the PRC or propose an alternative PRC. This protocol may be waived by agreement of the parties at a subsequent meeting in the event the party's absence was due to circumstances beyond its control.

6.4 Agreed-upon PRCs will be placed on a confirmation agenda, to be addressed at the start of the subsequent group of meetings, in order to allow parties time to seek final approval of the PRCs by their respective managements, when such approval has been stated by parties to be necessary. Any party may remove any PRC from the confirmation agenda for further workshop consideration, based on their management's direction.

6.5 Each Participant is responsible to keep his or her organization/constituency group(s) informed of the progress of the workshops and to timely seek advice, comments and authorization as required.

6.6 Participation by Proxy

Parties represented by a single Participant may designate another Participant to serve as their proxy for purposes of expressing levels of agreement, if they are unable to attend a workshop meeting. In order to utilize a proxy, the party must satisfy the following requirements:

6.6.1 The party shall notify the other parties by email or facsimile at least 1 business day prior to the meeting at which they expect to be absent;

6.6.2 The party shall provide clear directions to the proxy regarding any limitations on the proxy's authority, in the event the PRC is modified in the course of discussion; and

6.6.3 The proxy must inform the facilitator and Participants of their role at the beginning of the meeting.

7. COMMUNICATIONS AND PUBLIC NOTICE

7.1 Any or all Participants may meet or conference call among themselves between workshop meetings as desired or necessary to negotiate an advancement of their work.

7.2 Audio and video recording devices are not to be used in meetings for any purpose. Participants are encouraged to explore ideas freely and the only agreements are those explicitly reached.

7.3 The Facilitators shall be designated to keep the assigned ALJ informed of the dates, times, location and host contacts for upcoming workshop meetings, in time for that information to be posted on the Commission's website and to be periodically issued in rulings as the ALJ deems appropriate.

8. INFORMATION MANAGEMENT

8.1 A meeting summary will be prepared following each working group meeting stating:

8.1.1 All Participants at the meeting, including their e-mail addresses;

8.1.2 Key points of discussion, including PRCs discussed;

8.1.3 Agreements, if any, with supporting rationale and vote tallies; and

8.1.4 MAP proposals, if any.

8.2 The meeting summary will be prepared by a designated Participant. Meeting summaries will be available as soon as practicable and will be emailed to all Participants. The meeting summary will be reviewed for corrections by the Participants, preferably by email or teleconference between workshop meetings.

8.3 Information will be posted to the CPSD website, as necessary.

8.3.1 Workshop Participants, and the parties they represent, reserve all rights to preserve the confidentiality of information in their possession, and participation in the workshop shall not be implied or understood to constitute a waiver of such rights.

9. PARTICIPANT ROLES

9.1 The Facilitators

9.1.1 Consistent with the Phase 3 scoping memo and any amendments to it, work on behalf of the Participants under the direction of the Participants;

9.1.2 Make participation easier and encourage participation by all who wish to participate;

9.1.3 Remind Participants of the protocols as necessary;

9.1.4 Suggest strategies to move the discussion along, as appropriate;

9.1.5 Consistent with the Phase 2 scoping memo and any amendments to it, carry out such other supportive activities as agreed upon by the Participants or as directed by the ALJ.

9.2 The Participants:

9.2.1 Listen carefully, ask pertinent questions and educate themselves and others regarding the issues and interests that must be addressed, in a collaborative rather than confrontational manner.

9.2.2 Fully and thoughtfully explore the issues before forming conclusions.

9.2.3 Search for creative solutions that best serve the issues and interests that must be addressed.

10. WORKSHOP ACCESS AND ACCOMMODATIONS

Workshops shall be scheduled in locations that comply with the Americans with Disabilities Act.

APPENDIX E – LIST OF PHASE 3 WORKSHOP PARTICIPANTS

Phase 3 Workshop Participants

AT&T California
Bear Valley Electric Service, a division of Golden State Water Company
California Cable and Telecommunications Association
California Department of Forestry and Fire Protection
California Municipal Utilities Association
California Pacific Electric Company
California Public Utilities Commission's Safety and Enforcement Division
Comcast Phone of California, LLC
County of Los Angeles Fire Department
Cox California Telcom, LLC
Cox Communications California, LLC
Crown Castle NG West, Inc. f/k/a NextG Networks of California, Inc.
CTIA-The Wireless Association®
Extenet Systems
Frontier Communications
Hans Laetz
Los Angeles Department of Water and Power
Modesto Irrigation District
Mussey Grade Road Alliance
New Cingular Wireless PCS, LLC
Pacific Gas and Electric Company
PacifiCorp d/b/a Pacific Power
Sacramento Municipal Utility District
San Diego Gas and Electric Company
Small LECs[1]
Southern California Edison Company
Sprint Nextel
Sunesys, LLC
SureWest Telephone
The Utility Reform Network
Time Warner Cable
T-Mobile West Corporation, dba T-Mobile
TW Telecom of California, LLP
Verizon

[1] The Small LECs are the following carriers: 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.

APPENDIX F – WORKSHOP REPORT DRAFT OF GENERAL ORDER 95 SECTION IV (SHOWING ALL CONSENSUS PRCS)

Section IV
Strength Requirements for All Classes of Lines

40 General

The following rules cover mechanical strength requirements for each class of line (see Rule 20.6), either alone or involved in crossings, conflicts or joint use of poles. The rules of this section are supplemented in many instances by provisions in other sections.

41 Classification of Circuits and Grades of Construction

For the purpose of recognizing relative hazards, lines are segregated into classes which are defined in Rule 20.6. These classes of lines and the relation of lines to each other and to objects over which they are constructed determine the grade of construction.

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 and MMMM DD, YYYY by Decision XX-XX-XXX.

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"

Note: Table 3 revised March 30, 1968 by Decision No. 73813.

Note: Revised January 19, 1994 by Resolution SU–25 and MMMM DD, YYYY by Decision XX-XX-XXX.

42.1 Two or More Conditions

Where two or more conditions affecting the grade of construction exist, the grade of construction used shall be the highest required under any of the conditions.

42.2 Line Crossing Two or More Lines

Where a line crosses in one span over two or more other lines the grade of construction shall be not less than would be required if either of the lower lines crossed the other.

42.3 Line Crossing Involved Lines

Where one line crosses over another line which in turn is involved in a second crossing in the same span, the grade of construction for the highest line shall be not less than that required for the next lower line.

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

43.1 Heavy Loading

Heavy loading shall apply in all parts of the State of California where the elevation exceeds 3000 feet above sea level (see Appendix A for map indicating the approximate location of the heavy loading district). This loading shall be taken as the resultant stress due to wind, ice and dead weight under the following conditions:

A. Wind

A horizontal wind pressure of 6 pounds per square foot of projected area on cylindrical surfaces, and 10 pounds per square foot on flat surfaces shall be assumed. Where latticed structures are used, the actual exposed area of one lateral face shall be increased by 50% to allow for pressure on the opposite face, provided this computation does not indicate a greater pressure than would occur on a solid structure of the same outside dimensions, under which conditions the latter shall be taken.

B. Ice

A radial thickness of one–half inches of ice, weighing 57 pounds per cubic foot, on all conductors shall be assumed in computing vertical and wind loadings.

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

43.2 Light Loading

Light loading shall apply in all parts of the State of California where the elevation above sea level is 3000 feet or less (see Appendix A for map). This loading shall be taken as the resultant of wind pressure and deadweight under the following conditions:

A. Wind

A horizontal wind pressure of 8 pounds per square foot of projected area on cylindrical surfaces, and 13 pounds per square foot on flat surfaces shall be assumed. Where latticed structures are used, the actual exposed area of one lateral face shall be increased by 50% to allow for pressure on the opposite face, provided this computation does not indicate a greater pressure than would occur on a solid structure of the same outside dimensions, under which conditions the latter shall be taken.

B. Ice

No ice loading is to be considered.

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

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.

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

Note: Revised March 30, 1968 by Decision No. 73813, February 13, 1974 by Decision No. 82466 and MMMM DD, YYYY by Decision XX-XX-XXX.

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.

Note: Revised January 12, 2012 by Decision No. 1201032 and MMMM DD, YYYY by Decision XX-XX-XXX.

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

(a) Insulators are to be replaced before safety factors have been reduced (due to deterioration or changes in construction, arrangement, or other conditions subsequent to installation) to less than 95 percent of the safety factor specified in Rule 44.1.

(b) Insulators are to be replaced before safety factors have been reduced (due to deterioration or changes in construction, arrangement, or other conditions subsequent to installation) to less than 75 percent of the safety factor specified in Rule 44.1.

(c) Metal poles, towers, structures, and crossarms are to be replaced or reinforced before safety factors have been reduced (subsequent to installation) to less than 90 percent of the safety factor specified in Rule 44.1.

Note: Revised July 26, 1966 by Decision No. 71009; January 6, 1968 by Decision No. 73455; March 30, 1968 by Decision No. 73813; February 13, 1974 by Decision No. 82466;January 21, 1992 by Resolution SU–10, January 13, 2005 by Decision No. 0501030 and MMMM DD, YYYY by Decision XX-XX-XXX..

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 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.

Note: For the purpose of Rule 44.2, a material increase in load is an addition which 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.

Note: Added August 20, 2009 by Decision No. 09-08-029. Revised January 12, 2012 by Decision No. 1201032 and MMMM DD, YYYY by Decision XX-XX-XXX.

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 Grades "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.

Note: Revised January 13, 2005 by Decision No. 0501030, January 12, 2012 by Decision No. 120103 and MMMM DD, YYYY by Decision XX-XX-XXX.

44.4 Cooperation

All 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 following:

A. The most recent intrusive pole test data;

B. Any information regarding its facilities necessary to perform a pole loading calculation that is not readily available to the company performing the pole loading calculations through a field visit; and

C. A table of standard input values used by the Responding Company in pole loading calculations (e.g., standard conductor or cable sizes, tension values, and equipment sizes and weights).

In the event a pole attachment application or a joint pole application submitted to a pole owner is rejected, the pole owner shall provide the applicant with the reason(s) for the rejection with the returned application. In the event a pole attachment application or a joint pole application is rejected by a pole owner because it has failed to meet the pole loading limitations established by the pole owner (consistent with General Order 95 or any subsequent regulation), the pole owner should also provide the applicant with sufficient information to determine how the pole loading limitations were exceeded with the returned application.

Note: "Promptly" means as soon as practicable but, absent exigent circumstances or mutual agreement, no more than fifteen (15) business days from the date of the request. (Exigent circumstances include requests for intrusive data or other necessary information on transmission poles, or requests for information on a large number of poles in a limited time period.)

Note: Added January 12, 2012 by Decision No. 1201032

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

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.

Note: Rule 47.1 – Reduction in Stress, was deleted by MMMM DD, YYYY by Decision XX-XX-XXX.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

47.2 Change in Grade of Construction

Where sections of higher grade construction are located in lines of lower grade construction the longitudinal load on each end support of such sections at the level involved shall be taken as an unbalanced load in the direction of the higher grade section equal to the total pull of all conductors in that direction. For spans not exceeding 500 feet in length, where the pull in the direction of the higher grade section exceeds 30,000 lbs., the loading requirements may be modified to consider 30,000 lbs. plus one–fourth the excess above 30,000 lbs., to a maximum of 50,000 lbs. The construction of the end supports (including poles, structures, towers, crossarms, pins, insulators, conductor fastenings and guys) of such sections shall be such as to withstand at all times the load specified with a safety factor at least equal to unity.

In lieu of meeting the requirements of this rule on single poles or structures at ends of higher grade sections, the longitudinal load may be distributed over two poles or structures provided that the two poles or structures are suitably side guyed or are in a straight line with the direction of the longitudinal load of the higher grade section and that the two poles or structures comply with the requirements for the higher grade as to transverse strength and conductors between the two poles comply with the requirements for the higher grade.

47.3 End Supports in Grades "A" or "B" Construction

In Grades "A" or "B" construction the longitudinal load on each end support of crossings, conflicts or joint use, where located in lines of the same grade of construction, shall be taken as the unbalanced load equal to the tension of one–third of the total number of conductors (not including overhead ground wires), such one–third of the conductors being so selected as to produce the maximum stress in the supports. If the application of the above results in the fractional part of a conductor, the nearest whole number of conductors shall be used. The construction of the supports (including poles, structures, towers, crossarms, pins, insulators, conductor fastenings and guys) shall be such as to withstand at all times the load specified with a safety factor at least equal to unity. Excluded from the requirements of this rule, where Grade "B" construction is required, are Class L lines crossing minor railways and conductor fastenings of Class C circuits crossing major railways.

Note: Rule 47.3 – Unbalanced Loads, was deleted by MMMM DD, YYYY by Decision XX-XX-XXX.

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 factor specified in Rule 44.

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

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

48.1 Wood

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.

Table 5: Wood Strengths

Species	Modulus of Rupture in Bending (a)	
	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	6,800 (c) lbs per square inch
Fir, white or red, local	4,700 lbs per square inch	5,600 lbs per square inch
Pine, southern yellow, dense	6,300 lbs per square inch	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.

Note: Revised April 26, 1965 by Decision No. 68835; March 9, 1988 by Resolution E–3076 and October 9, 1996 by Resolution SU–40.

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:

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

Where S_{max} = maximum allowable working stress, lbs per square inch

f_s = 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.

Note: Revised March 30, 1968 by Decision No. 73813, and January 13, 2005 by Decision No. 0501030.

48.3 Concrete

A. Reinforced Concrete

Values used for ultimate strengths of reinforced concrete, in conjunction with safety factors given in Rule 44, shall not exceed the following:

Reinforcing steel, tensile or compressive strength, pounds per square inch: 55,000

Concrete, 1:2:4 mixture	Age	Compressive Strength
	7 days	900 lbs per sq. in.
	30 days	2,400 lbs per sq. in.
	90 days	3,100 lbs per sq. in.
	6 months	4,400 lbs per sq. in.

If reinforced concrete is designed for higher strength values which are proven by test, such values may be used in lieu of the figures given.

B. Prestressed Concrete

The minimum strength of the materials used in prestressed concrete structures used in conjunction with the safety factors given in Table 4 shall be as follows:

Reinforcing Steel - yield strength…40,000 lbs per sq. in.

Prestressing Steel – yield strength…188,000 lbs per sq. in.

Concrete - compressive strength at 28 days…4,000 lbs per sq. in.

Other strength values may be used provided the strength values used for design are proven by tests.

Note: Rule 48.3–B added on February 13, 1974 by Decision No. 82466.

48.4 Other Structural Materials

For other structural materials, the safety factor specified in Rule 44 shall be applied as follows:

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

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, considering yield 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: Revised March 30, 1968 by Decision No. 73813.

48.5 Conductors, Span Wires, Guys and Messengers

Values used for ultimate strengths of wires and cable shall not exceed those given in Appendix B. The ultimate strengths given in Table 17 to 24 of Appendix B, except for medium–hard drawn copper, are based on the minimum ultimate strengths given in the standard specifications of the American Society for Testing Material. The ultimate strengths given in Appendix B for medium–hard drawn copper are based on the standard specifications of the ASTM and provide an allowance above the minimum values of one–quarter of the range between minimum and maximum values. For use of types of wires and cables of other material not included in Appendix B, values for ultimate strengths similarly derived from specifications of the ASTM shall be used except that, if such specifications are nonexistent, maker's specifications may be used provided that tests have been made which shall justify the maker's rating for ultimate strength.

48.6 Tower or Pole Foundations and Footings

The resistance of soil to foundations 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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

Note: Rule 48.7 – Metallic Service and Meter Poles, was deleted by MMMM DD, YYYY by Decision XX-XX-XXX.

49 Detailed Strength Requirements

49.1 Poles, Towers and Other Structures

A. Strength (See Rule 48)

(1) Wood poles shall be of sound.

(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.

(3) Crossing spans - for crossing spans, spliced or stub reinforced poles or pole top extensions, including the attachment (joint) of the different members involved, shall meet all of the vertical, transverse and longitudinal strength requirements of these rules as if a whole pole were used.

Note: Revised July 26, 1966 by Decision No. 71009; March 30, 1968 by Decision No. 73813; February 13, 1974 by Decision No. 82466, January 21, 1992 by Resolution SU–10 January 13, 2005 by Decision No. 0501030 and MMMM DD, YYYY by Decision XX-XX-XXX..

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	16

Note: MMMM DD, YYYY by Decision XX-XX-XXX.

* 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.

C. 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.

Note: Revised July 26, 1966 by Decision No. 71009, February 13, 1974 by Decision No. 82466, January 19, 1994 by Resolution SU–25, October 9, 1996 by Resolution SU–40, January 13, 2005 by Decision No. 0501030 and MMMM DD, YYYY by Decision XX-XX-XXX..

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 1/2	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

Note: Revised March 9, 1988 by Resolution E–3076

D. Gains

Gains or equivalent means shall be provided for increasing surface contact of crossarms with round wood poles. Where gains are cut, the depth shall be not less than one–half inch or more than one inch. "Slab" gains, metal gains, pole bands, or assemblies of wood or metal supports that provide suitable surface contact and adequate strength are permitted.

E. Replacements (See Rule 44.3)

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

B. Minimum Size

The physical properties as a result of dimensions, shape and cross–sectional area of crossarms shall be such as to result in sufficient strength to meet the requirements of these Rules.

Note: Part (3) added February 13, 1974 by Decision No. 82466; Revised January 21, 1992 by Resolution SU–10.

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

(1) Longitudinal Loads Normally Balanced:

(a) Supply Lines: Where longitudinal loads are normally balanced, crossarms supporting supply conductors shall have sufficient strength to withstand a load, applied in the direction of the conductors at the outer pin position, of 700 pounds with a safety factor of not less than unity.

(b) Communication Lines, Class C: Where longitudinal loads are normally balanced, crossarms supporting Class C conductors shall have sufficient strength to withstand a load, applied in the direction of the conductors at the outer pin position, of 400 pounds with a safety factor of not less than unity.

(2) Longitudinal Loads Normally Unbalanced: Crossarms subjected to unbalanced longitudinal loads shall have sufficient strength to meet the strength requirements with safety factors at least equal to those specified in Rule 44.

At unbalanced corners and dead ends in Grades "A", "B" or "C" construction, where conductor tension is held by cantilever strength of pin–type insulators and pins, double crossarms shall be used to permit conductor fastenings at two insulators to prevent slipping. In lieu of double crossarms and double insulators, single crossarms may be used with single insulators and steel pins and prefabricated conductor ties.

For conductor tensions up to 2,000 pounds per conductor, double wood crossarms fitted with spacing devices at each end will be considered as meeting the strength requirements of Rules 47.4 and 47.5.

Note: Revised March 9, 1988 by Resolution E–3076.

D. Replacements (See Rule 44.3)

E. Guard Arm

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.

Note: Added January 13, 2005 by Decision No. 0501030 and revised MMMM DD, YYYY by Decision XX-XX-XXX.

49.3 Pins and Conductor Fastenings

A. Material

(1) Pins: Insulator pins shall be of galvanized steel, galvanized iron or other corrosion–resisting metal or of locust or other suitable wood.

(2) Fastenings: Conductor fastenings shall be of galvanized steel, galvanized iron or other corrosion–resisting metal.

B. Size

(1) Wood Pins: The minimum diameter of the shank shall not be less than 1–1/4 inches.

(2) Metal Pins: The minimum diameter of the shank shall not be less than 1/2 inch.

(3) Fastenings and Tie Wires: Fastenings and tie wires shall have no sharp edges at points of contact with conductors, and shall be applied in such a manner as not to damage the conductor. Materials and minimum sizes of tie wires for various sizes and types of conductors shall be as shown in Table 7. Flat tie wire having a cross–sectional area not less than that of round wire of the gauge specified for tie wires may be used.

Table 7: Size and Material of Tie Wires

Line Conductor		Tie Wire	
Material	**Size**	**Size**	**Material**
Copper, bronze, copper covered steel or composites of any of them	6 AWG & smaller	Same as line conductor	Soft copper or annealed copper–covered steel
	4 AWG	6 AWG	
	2 AWG & larger	4 AWG	
Galvanized iron or galvanized steel	10 BWG & smaller	Same as line conductor	Soft galvanized iron or galvanized steel
	9 BWG	10 BWG	
	8 BWG	9 BWG	
	4 & 6 BWG	8 BWG	
Aluminum or ACSR	4 AWG & smaller	Same as line conductor	Soft aluminum or aluminum alloy
		or 6 AWG	Strong alloy aluminum*
	2 AWG & larger	4 AWG	Soft aluminum or aluminum alloy
		or 6 AWG	Strong alloy aluminum*

* Minimum tensile strength of 350 pounds

Note: Revised July 22, 1968 by Decision No. 74342.

C. Strength

Insulator pins and conductor fastenings shall be able to withstand the loads to which they may be subjected with safety factors at least equal to those specified in Rule 44.

Note: A 1–1/2 inch by 9 inch locust pin will usually provide cantilever strength up to 1,000 pounds tension in the conductor with the conductor 3–1/2 inches above the crossarm and a safety factor of unity.

(1) Longitudinal Loads Normally Balanced:

(a) Insulator Pins: Where longitudinal loads are normally balanced, insulator pins which support conductors shall have sufficient strength to withstand, with a safety factor of not less than unity, a load at the conductor position as follows:

Pins supporting supply conductors	700 pounds
Pins supporting Class C conductors	400 pounds

(b) Conductor Fastenings: Where longitudinal loads are normally balanced, tie wires or other conductor fastenings shall be installed in such a manner that they will securely hold the line conductor to the supporting insulators and will withstand without slipping of the conductor unbalanced pulls as follows:

Supply conductor fastening	40% of the maximum working tensions but not more than 500 pounds.
Class C conductor fastenings	15% of the maximum working tensions but not more than 300 pounds.

Tie wires are not required on Class C conductors at point– type transpositions in Grade F construction.

(2) Longitudinal Loads Normally Unbalanced: At unbalanced corners and dead ends in Grades "A", "B" or "C" construction, where conductor tension is held by cantilever strength of pin–type insulators and pins, double insulators and wood pins or single insulators and steel pins shall be used. Each line conductor shall be tied or fastened to both insulators, or the single insulator, to prevent slipping of the conductor under maximum working tension with a safety factor of 2 for the temperature and loading conditions specified in Rule 43.

At changes in grade of construction and at end supports in Grades "A" or "B" construction where the conductors are not dead–ended and are supported on pin–type insulators, double insulators and pins with tie wires, or equivalent fastenings, will be considered as meeting the strength requirements of Rules 47.4 and 47.5 for conductor tensions up to 2,000 pounds per conductor.

Note: Revised March 9, 1988 by Resolution E–3076.

D. Replacements (See Rule 44.3)

49.4 Conductors

A. Material

Conductors shall be of copper, copper–covered steel, bronze, stranded cable composites of any of the foregoing, aluminum, aluminum cable steel reinforced, galvanized iron, galvanized steel or of other corrosion–resisting metal not subject to rapid deterioration, except that in common neutral systems the provisions of Rule 59.3–A shall also apply.

B. Size

The minimum sizes of conductors which shall be used in spans of 150 feet or less under the several classes of construction and loadings in both urban and rural districts are specified in Table 8. Larger conductors than those specified in the table will often be necessary to maintain reasonable sag and at the same time provide the required safety factors of Rule 44, ground clearances of Table 1, and wire clearances of Table 2.

Conductors of the sizes specified in Table 8 may be used in spans longer than 150 feet, except when specifically prevented by Rule 49.4–C, provided the sags and conductor positions are so adjusted that the allowable working tensions and clearances of this Order are not violated.

The common neutral conductor in common neutral systems shall conform to the requirements of Rule 59.3–B in addition to the above requirements.

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	1/4 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	1/4 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)	-

(a) Communication conductors crossing over major railroads may be smaller but shall be not less than as specified in Rule 113.4.
(b) Three–sixteenth–inch strand may be used upon special permission of this Commission.
(c) May be smaller but shall provide tensile strength not less than #8 AWG soft copper, if less than 750 Volts, as per Rule 49.4–C2.
(d) Communication service drops over supply lines shall conform to Rules 32.2–F and 32.2–G.
(e) #12 AWG or #14 NBS.
(f) Paired wire may be smaller per Rule 49.4–C7b.
(g) High strength paired wire may be smaller per Rules 49.4–C7b and 49.4–C8.
(h) May be reduced per Rule 49.4–C3.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

C. Strength

(1) Heavy Loading Districts: Conductors in Grade "A" construction and in spans exceeding 150 feet shall have a tensile strength not less than that of #4 AWG medium–hard–drawn copper, and said conductors shall preferably be stranded.

(2) Light Loading Districts: The following requirements apply for various grades of construction and span lengths.

Conductors in Grade "A" construction in spans exceeding 150 feet and not exceeding 300 feet in length shall have a tensile strength not less than that of #6 AWG medium–hard–drawn copper.

Supply conductors of less than 750 volts in Grade "B" or "C" construction in spans not exceeding 150 feet in length shall have a tensile strength not less than that of #8 AWG soft–drawn copper.

(3) Heavy or Light Loading Districts: Where signal or communication lines take Grade "B" or "C" classification other than at railroad crossings, a minimum size of #8 AWG medium–hard–drawn copper or its equivalent in tensile strength may be used.

(4) Conductors of Voltages Exceeding 17,000 Volts: Conductors of voltages exceeding 17,000 volts crossing conductors of less than 17,000 volts, or crossing a public highway shall have a strength at least equal to #4 AWG stranded medium–hard–drawn copper. In lieu of this, the conductors carrying more than 17,000 volts shall, at the point of crossing, be supported on poles of such height and so placed that under no circumstances can the conductor of over 17,000 volts, in case of breakage of same or otherwise, come in contact with any conductor carrying less than 17,000 volts, or fall within a distance of 10 feet from the surface of any public highway.

(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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

(6) Splices: Splices in line conductors shall be in accordance with the requirements of Table 4, except as provided in Rules 103.1–A and 113.1–A.

(7) Service Drops:

(a) Supply: The minimum sizes shall apply only where the span does not exceed 150 feet. The minimum for supply lines of like voltage and grade shall apply when the service drop is in excess of 150 feet. Supply service drops of 0-750 volts shall, in all cases, have a weather–resistant covering equivalent to standard double braid weatherproofing except for multiple conductor service drop cable with a bare neutral conductor provided that the attachment of such cable at the pole and building ends shall be by means of an insulator.

Note: Revised May 29, 1951 by Resolution No. E–756 and September 18, 1968 by Decision Number 72984.

(b) Communication: Communication service drops of #16 AWG paired copper wire may be used, provided they do not cross over supply lines, trolley contact or feeder conductors, or railways.

Paired wire communication service drops of #18 AWG high strength bronze or high strength copper–covered steel may be used provided the breaking strength of the pair is not less than 340 pounds.

(8) Communication Line Conductors: Paired wire of #18 AWG high strength bronze or high strength copper–covered steel may be used as communication line conductors provided the breaking strength of the pair is not less than 340 pounds.

D. Replacements (See Rule 44.3)

E. Connections

All electrical connections shall be of suitable electrical and mechanical design.

49.5 Insulators

A. Line

Insulators, supports, clamps and other miscellaneous attachments shall be designed to withstand, with at least the safety factors specified in Rule 44, the mechanical stress to which they are subjected by conductors, wires or structures, under the loading conditions as specified in Rule 43. Pin insulators shall effectively engage the thread of the pin for at least two and one–half turns.

B. Guy

Guy insulators, including insulators in messengers, shall have mechanical strength at least equal to that required of the guys in which they are installed.

C. **Replacements** (See Rule 44.3)

D. Post

Post insulator units including insulator supports, clamps, and other miscellaneous attachments shall have a cantilever strength determined in accordance with paragraph 5.1.3 of the American Standard Insulator Tests, Publication No. C29.1–1961, or the latest revision thereof, equal to or greater than the product of the safety factors specified in Rule 44 and the mechanical stress to which they are subjected by conductors, wires, or structures under the loading conditions as specified in Rule 43.

Note: Added January 6, 1968 by Decision No. 73455.

49.6 Guys and Anchors

A Material

The exposed surface of all guys and guy rods shall be of corrosion–resisting material.

B. Size

The size and ultimate strength of guys crossing in spans over Class H, L, T or C circuits shall be not less than as specified in Table 9 and shall also be such as to provide safety factors not less than those specified in Rule 44 for the loads imposed by the construction involved under the loading conditions specified in Rule 43.

Table 9: Minimum Size and Strength of Guys Crossing over Class E, H, L, T or C Circuits

Material of Strand	Minimum Size	
	Anchor Guys	Overhead Guys
Galvanized Steel:		
Common or Siemens–Martin	5/16 in. Diameter	1/4 in. Diameter
High Strength or Extra–High Strength	1/4 in. Diameter	3/16 in. Diameter
Copper–Covered Steel	3 No.9 AWG	3 No. 10 AWG
Aluminum–Covered Steel	3 No.9 AWG	3 No. 10 AWG
Bronze	1/4 in. Diameter	3 No.10 AWG
Minimum Allowable Ultimate Strength of Guys	3,200 Pounds	1,900 Pounds

Note: Table 9 revised March 30, 1968 by Decision No. 73813.

C. Strength

Where guys are used with poles or similar structures, capable of considerable deflection before failure, they shall be able to support the entire load, the pole below the point of guy attachments acting merely as a strut. Stranded wires shall be used when the ultimate strength of the guy exceeds 1,800 pounds. Anchor rods and their appurtenances shall meet the same strength requirements as the guy wire or strand (See Rule 44).

D. Replacements (See Rule 44.3)

49.7 Messengers and Span Wires

A. Material

Messengers and span wires shall be stranded and of galvanized steel, copper–covered steel or other corrosion–resisting material not subject to rapid deterioration.

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

D. Replacements (See Rule 44.3)

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.

Note: Revised MMMM DD, YYYY by Decision XX-XX-XXX.

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