**2nd Draft of Meeting Minutes of**
**National Electrical Safety Code Subcommittee 5**
**Overhead Lines—Strength and Loading Meeting**
**October 19-21, 1998**
**@ IEEE Standards Office in Piscataway, NJ**
**Date of Final Minutes 22 February 1999**

**Attendance Record: x=present; a=absent**

| Name | Organization | 10/19 | 10/20 | 10/21 |
|---|---|---|---|---|
| Richard Aichinger (A) | AISI | x | x | x |
| Nelson Bingel | AWPA | x | x | x |
| Allen Clapp | Self | x | x | x |
| Clayton Clem | TVA | x | x | x |
| Ron Corzine | SEEX | x | x | x |
| Darrel Davidchik | EIA | x | x | x |
| Frank Denbrock | IEEE | x | x | x |
| Nicholas DeSantis | EEI | x | x | x |
| Bruce Freimark | EEI | x | x | x |
| Bill Fuller | NSPE | x | x | x |
| Jerry Hanson | Self | x | x | x |
| Doug Hanson | WAPA | a | a | a |
| Eddy Harrel | EEI | x | x | x |
| Don Heald | RUS | x | x | x |
| Richard Hensel | IEEE | x | x | x |
| Walt Jones | IEEE | a | a | a |
| Leon Kempner | BPA | x | x | x |
| Bob Kluge | EEI | x | x | x |
| Daniel McGee | AISI | x | x | x |
| Brian Lacoursiere (A) | AISI | x | x | x |
| Michael Madore | APPA | a | a | a |
| Bob Peters | IEEE | x | x | x |
| Tom Pinkham | IEEE | a | a | a |
| Joe Rempe | APPA | x | x | x |
| Wade Shultz | SEEX | x | x | x |
| Lawrence Slavin | ATIS | x | x | x |
| Jerry Wong | EEI | x | x | x |
| Guests | | | | |
| Martin Rollins | | x | x | x |
| Adrian Rojas | | x | x | x |
| Chuck Amrhyn | | a | x | x |
| Andy Schwalm | | x | a | x |
| Hank Kientz | | a | a | x |

**Special Notes:**
At the meeting, the subcommittee decided that no change of the rule is required **for IR 479.** Subsequently, Slavin and Freimark developed a proposal to clear up the wording.

See also Rule 242, CP 2262. Freimark suggests that the revised language should be removed and the following subcommittee rationale should be added: **The present language is adequate.** At Table 253-1, CP 2219, Bruce Freimark suggested that we should turn that around and put the higher 1.50 value in the table and the lower 1.30 value in the footnote6.
These three modification proposals were provided to each member with the 2nd draft of the minutes and each member was requested to review the attached proposal and provide a vote and/or remarks to Allen Clapp by January 7, 1999 at allen@clappresearch.com. Only a few members responded. *As a result, the language has not been changed in these minutes and Frank Denbrock is requested to place them on the agenda to be considered at the New Orleans Meeting.*

**Note that the next meeting date has been changed to the 10th and 11th of April in New Orleans**

**1.0 Introduction of Subcommittee Members, Alternates, Guests and Staff Personnel**
Sue Vogel and Frank Denbrock commented on facilities and other information

**2.0 Voting Eligibility**
Allen Clapp explained voting requirements, including where comments are required, and confirmed eligibility of voters

**3.0 Review, Discussion and Approval of Agenda**
Original agenda items 8.4.23 and 7.2 were moved to 8.5.38 and 8.38, respectively.

**4.0 Review and Approval of Minutes of July 10-12 San Diego Meeting**—Approved Unanimously

**5.0 Identification and Expression of Concerns**
Each person was given an opportunity to voice concerns.

**6.0 Presentations and Discussions on New Developments, Updates and Research**

**6.1 Update on New ASCE-7 Extreme Wind Map**—Kempner
Status of the extreme wind map is unchanged. A change proposal was submitted to adopt the ASCE-7 3-second gust wind map along with appropriate gust response factors.

**6.2 Update on New ASCE-7 Ice Data, Ice/Wind Map**—Clem/Kempner/Wong/Peters
The new ice map has been approved for inclusion into the commentary (not main body) of ASCE 7. Many of the areas are not dissimilar from the result of today's NESC. For example, the NESC _ inch (1/2 inch) of ice with overload factors is essentially _ inch (1 inch) of ice. The data was apparently measured down through the Atlanta area and estimated down into Florida, which gives some results that are surprising to some—new studies are under way in Florida. ASCE language in Section 10 indicates that it is intended to apply to overhead lines.

**6.3 Update on ASCE's Loading Guides and Other Standards**—Kempner/Clem/Peters/Wong/Heald/DeSantis
ASCE has started to update Manual 74—transmission line loading (chaired by Wong). The first meeting will be in December of 1998. Goal is to rewrite in

one year and advance to a standard. Expanding it to include distribution lines is being considered. The substation manual is also under development.

**6.4 Seismic Requirements for Transmission and Distribution Structures (International Building Code)**--Kempner

There will be one building code in the US in the year 2000—the International Building Code—it includes "other structures." National Earthquake Protection documents will be in the new IBC and, unless action is taken, would apply to utility structures under the present wording. Clem and Kempner are participating. Changes have been submitted to exempt transmission structures. Task Force 5.1.9 (Kempner as chair, Clem, Heald, Freimark, McGee, and Hensel) was created to prepare a proposal to address seismic loading in the NESC.

**7.0 Old Business Items**

**7.1 WG 5.1—Coordination of Continuity of Sections 24, 25 & 26 as covered in CP 1930**

Clapp indicated that Task Force 5.1.3 had prepared the subcommittee proposals from the July meeting—taken up in the normal rotation below.

**7.2 WG 5.2—Complete revision of Sections 24-26 as covered by CP 1964**—Peters

Discussion was held after all proposals for change to present code language were considered. See CP 1964 under Section 8 of these minutes.

**7.3 WG 5.6—Section 27**—Pinkham and Schwalm

**7.3.1 Task Force 5.6.1—Coordinate changes in insulator improvements**

The change proposal is in.

**7.3.2 Task Force 5.6.2—Insulator test methods, overload factors and loadings**

The change proposal is in.

**7.3.3 ASNI C29 Changes—No discussion held.**

**7.4 Update on status of ANSI O5**

The meeting will be held in the Spring of 1999. The body of the standard will change.

**7.5 Task Force 5.1.4**

Proposals were made of address inconsistencies in Grade B and Grade C.

**7.6 Task Force 5.1.7**

The change proposal is in.

**7.7 Task Force 5.1.8—Relative reliability of Grade B vs Grade C.**

Extensive discussions were held. Presentations were made by Martin Rollins, Dr. Habib Dagher, Kempner, and others.

**7.8 Miscellaneous items relating to SC5 scope**

Subcommittee WG 4.8 will meet in December 1998.

**7.9 Additional Items of Old Business**

Task Force 5.1.10 (Kluge, Kempner, McGee, Peters) was charged with drafting a letter to ASCE re: the scope of ASCE 7 and to volunteer Bingel as a member.

**8.0 New Business Items—Change Proposals by order of sections and rules**

**Definition**
**Fiber-reinforced composite structures**
**CP 2370**

**Recommendation:** Accept as modified.

Fiber-reinforced composite structures and components. Fiber-reinforced thermoset or thermoplastic resin structure and structural components.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 94A**
**CP 2283**

**Subcommittee Recommendation:** No Action Required.

**Rule 94B**
**CP 2284**

**Subcommittee Recommendation:** No Action Required.

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Rule 242**
**CP 2262**

**Subcommittee Recommendation:** Reject.

Revise the main paragraph of Rule 242 by inserting new language and making the last sentence a new paragraph as follows.

The grades of construction required for conductors are given in Tables 242-1 and 242-2. The grades of construction for conductors are based upon the character of the line(s) or land(s) below. If the structure upon which conductors are supported is a conflicting structure that is required by Rule 243A4 to meet Grade B, the conductors supported thereon must only meet the grade of construction required for the land(s) or line(s) which they normally overhang.

For the purpose of these tables, certain classes of circuits are treated as follows:

Revise Rule 243A4 as follows.

The grade of construction required for a conflicting structure ~~(first circuit)~~ shall be determined from the requirements of Rule 242 for crossings of its conductors over another line, (including another circuit, railroad tracks, or the traveled way of limited access highways). The conflicting structure's conductors ~~(first circuit)~~ shall be assumed to cross the other ~~circuit's conductors (second circuit)~~ line for the purposes of determining the grade of construction required for the conflicting structure.

NOTE: The resulting structure grade requirement could result in a higher grade of construction for the structure than for the conductors carried thereon.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Clapp
Abstention:

**Explanation of Vote:**

**Table 242-1, Footnote 3**
**CP 2217**

**Subcommittee Recommendation:** No Action Required.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 243A4**
**CP 2262**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Rule 250A & C**
**CP 2151**

**Subcommittee Recommendation:** The motion is to place CP 2151 in the preprint for comment.

**Subcommittee comment:** The subcommittee request comments on the appropriateness of the proposal.

Revise Rule 250A1 as follows.

1. It is necessary to assume the wind and ice loads that may occur on a line. Two weather loadings are specified in Rules 250B and 250C. ~~Where both rules apply, t~~The required loading shall be the one that has the greater effect.

Revise the first paragraph of Rule 250C as follows.

~~If no portion of a structure or its supported facilities exceeds 18 m (60 ft) above ground or water level, the provisions of this rule are not required, except as specified by the addition in Rule 261A1. Where a structure or its supported facilities exceeds 18 m (60 ft) above ground or water level~~ tThe applicable horizontal wind speed of Fig 250-2, determined by the linear interpolation, shall be used to calculate horizontal wind loads which shall be applied to the entire structure and supported facilities without ice loading with the applicable shape factors in Rules 251A2 and 252B2. The following formulas shall be used to calculate wind loads on projected areas:

load in newtons = 0.613 $(Vm/s)^2$ _: shape factor _ projected area ($m^2$)

load in lb = 0.00256 $(Vmi/h)^2$ _ shape factor _ projected area ($ft^2$)

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Denbrock, J. Hanson, Kempner, McGee, Peters, Rempe; D. Hanson, Jones & Madore

Negative:
Davidchik, DeSantis, Freimark, Fuller, Harrel, Heald, Hensel, Kluge, Shultz, Slavin, Wong
Abstention:

**Explanation of Vote:** The initial vote to approve this CP 2151 resulted in a tie vote. In the balloting, Slavin moved from affirmative to negative. The ballot votes of Madore, D. Hanson & Jones broke the tie in the affirmative.

**Shultz, Hensel, Harrel, Fuller, Freimark, DeSantis:** Increasing reliability by removal at the 60' loading exemption is questionable. It ignores the problems with debris being blown into facilities and tornadic activity during extreme wind events; this would remain an unresolved problem even with removal of the exemption. Such a dramatic increase in loading does not appear reasonable, and it would likely not increase safety**.**
**Heald:** I support the removal of the 60-ft limit. However, I feel that at extreme winds, there should be a distinction between Grade B and Grade C construction. This change proposal is incomplete and does not address this issue.
**Wong**: A technically sound method should be developed to deal with lower profile wind loads before removing the 60 ft limit.
**Kluge:** I support CP 2363.
**Slavin**: Comments: While it does appear reasonable to consider the effect of extreme wind on structures and conductors at less than 60 ft. (especially considering that the wind speeds are established by monitoring at 33 ft.), in general I agree with the dissenting (negative) votes that such a potentially dramatic increase in loading is not presently warranted. (The actual increase, if at all, will depend upon the diameter of the conductors. In the absence of ice buildup, and due to the use of OLFs = 1.0 in Rule 250C, relatively small conductors would still be more heavily loaded by the present Rule 250B, Combined Ice and Wind Loading, combined with OLFs>1.0.) I believe a study of previous history and experiences of distribution systems should be conducted to determine the need and value of such potentially increased load requirements associated with Rule 250C, which would be still further aggravated by the possible use of 3-sec. Gust speeds vs. the previous fastest mile speeds. In addition, the general consensus of the subcommittee regarding the other CPs has been to maintain the 60 ft. exclusion (i.e., for single-pole structures, with conductors mounted), and the recommendation for removing the exclusion, as in CP 2151,would be confusing.

**Rule 250C**
**CP 2305**

**Subcommittee Recommendation:** Accept in Principle. See action taken on CP 2306.
.
**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, McGee, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Kluge, Peters
Abstention:

**Explanation of Vote:**

**Rule 250C**
**CP 2306**

**Subcommittee Recommendation:** Accept in Principle.

Modify Rule 250C by adding "or Rule 261A2f" to the end of the first sentence and referring to Rule 261A1c. The first sentence will read as follows: If no portion of a structure or its supported facilities exceeds 18 m (60 Ft) above ground or water level, the provisions of this rule are not required, except as specified ~~by the addition~~ in Rule 261A1c or Rule 261A2f.

Create a new Rule 261A2f using the same words as presently in Rule261A1c.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, McGee, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Kluge, Peters
Abstention:

**Explanation of Vote:**
**Heald:** All structures without conductors should meet extreme winds from any direction irrespective of height. This requirement has been included in the Code to cover structures during construction in which conductors have not yet been installed and which could help provide longitudinal support. This requirement is important for pre-engineered structures in which longitudinal capacity of the structures could be considerably less than the transverse strength. For wood structures without conductors, the strength of naturally grown wood poles will meet extreme winds from any direction. As a result, to include this requirement in the wood section for naturally grown wood poles is a moot point. However, for engineered wood products and structurals, it probably is wise to include this requirement in the wood section.
**Kluge**: No supporting comments given for adding a new Rule 261A2f. Rule 250C already exempts all structures 60 foot or less in height, irrespective of the structure materials.

Rule 261A1c was placed into the Code for manufactured structures that may not be capable of standing alone (without conductors or guys). Wood poles, as naturally grown, are capable of standing alone.
Therefore, this change does not accomplish anything of substance. There are other change proposals that conceptually are more acceptable (e.g., CP 2151 with some modifications for Grade C, CP2307 or CP 2363).
**Peters**: We cannot ascertain why Rule 261A1c was originally placed into the NESC for metal prestressed and reinforced concrete structure and therefore cannot justify extending the requirements to wood structures.

**Rule 250C**
**CP 2307**

**Subcommittee Recommendation:** Accept**.**

Extreme Wind Loading
If no portion of a single pole structure or its supported facilities exceeds 18 m (60 ft) above ground or water level, the provisions of this rule are not required, except as specified by the addition in Rule 261 A1.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Davidchik, Denbrock, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Kempner, DeSantis, Clem
Abstention:

**Explanation of Vote:**
**Kempner :** This proposed change would exclude all single pole structures both distribution and transmission structures with heights less than 60 ft. There is no engineering basis for excluding this specific structure type.

**Rule 250A3**
**CP 2308**

**Subcommittee Recommendation:** Accept as modified.

Leave the word “therein” instead of adding “herein”. Change “presented in Rules 250C” to “stated in Section 25”. Remove the word “minimum” from the new sentence. The words” ice and wind” change to “weather”.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Hensel, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Kempner, Heald
Abstention:

**Explanation of Vote:**
**Kempner:** There is no guidance given for the application of load factors applies to a 50-year return on ice. The load factors as specified in Rule 250B are not appropriate for extreme value ice data. This will result in extreme conservatism.

**Rule 250D**
**CP 2309**

**Subcommittee Recommendation:** Accept as modified.

Revise Rule 250B to read as follows: One of the following alternate methods shall be used to determine loads for combined ice and wind loading. Either method may be used.

The present Rule 250B will become new Rule 250B1 with a revised title "Combined Ice and Wind Loading – Method 1" and containing the words of the present Rule 250B.

A new Rule 250B2 will be added with the following title and words.

250B2 Combined Ice and Wind Loading – Method 2.
The applicable combined radial ice and wind loadings of Fig. 250-3 shall be used to calculate vertical and horizontal wind and tension loads at –10 °C (15 °F). The wind shall be applied to the entire structure and supported facilities with the applicable wind load shape factors in Rules 251A2 and 252B2. Ice is assumed to weigh 913 kg/$m^3$ (57 lb/$ft^3$) and shall be applied to the wires only.

A new Fig. 250-3 will be created from Figs C10-1, C10-2, C10-3 of ASCE 7-98.

Also where Rule 250C is presently referenced regarding overload factors, add a similar reference to Rule 250B2. References to 250C are found in: Rule 250A1 (also change the beginning of the sentence to read "~~Two~~ Three weather loadings…"); Table 253-1; Table 253-2; Rule 261I; Rule 261K2; Table 261-1A; Table 261-1B; Rule 261H3a; Rule 261H3c; and Rule 277

Revise all references to Rule 250B to reflect these changes.

**Subcommittee Comment:**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp Clem, Davidchik, Denbrock, DeSantis, Freimark, Kluge, McGee, Peters, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Rempe, Shultz,
Abstention

**Explanation of Vote:**
**J. Hanson**: I do not agree with the proposal to add a new Rule with the current ASCE-7 ice map. A map in the commentary is not considered part of the Standard.

The ASCE committee did not think the map is good enough to add to their Standard. Why should SC5 adopt the map?

Also, the map has too many "holes" to be useful and different methodologies were used for the Pacific Northwest.

Without an acceptable ice map the CP should not be approved.

**Shultz:** For methods to be alternatives, they should yield reasonably comparable results. These methods yield significantly different results in some situations per submitter.

**Kempner**: Acceptance of the ASCE 7-98 is premature at this time. This is demonstrated by the placement of this map in an ASCE 7-98 commentary. Also, the acceptance of two combined ice and wind loading methods that may give significantly different ice loads with no guidance on which one to use is unacceptable in a safety code.

**Rule 250C**
**CP 2363**

**Subcommittee Recommendation:** Accept as modified.

Add the present first sentence of Rule 250C back into the proposal to begin the new Rule 250C. Begin the second sentence of new Rule 250C as follows:
"Where a structure or its supported facilities exceeds 18 m (60 ft) above ground or water level the structure and its supported facilities …."

Do not modify Rule 261A1c.

In the last paragraph of Rule 250C revise the wording to read as follows:
"…. are based on open terrain with scattered obstructions (Exposure C as defined in ASCE 7-98)."

The reference in the first paragraph of revised Rule 250 will refer to Fig 250-2, not 250C-1.

Under Item 1C of this proposal, Fig. 250-2 will be replaced with the new Fig. ASCE7-98 three-second gust wind speed.

In the revised Table 250-2 revise the last line before the note to read:
"Minimum kz = 0.85"
"h = structure or wire height as defined in Rule 250C1"

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**
**Heald:** I support the use of the updated 50-year wind map based on a 3-second gust. However, I feel that Table 250-2 and Table 250-3 should be significantly simplified. In addition, the proposal does not consider significant digits.

**Table 250-2**
**CP 2216**

**Subcommittee Recommendation:** Accept**.**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore

Negative:
Abstention:

**Explanation of Vote:**

Rule 250A.4
CP 2394
Submitted by Subcommittee 5
The structural capacity provided by meeting the loading and strength requirements of Sections 25 and 26 provides sufficient capability to resist earthquake ground motions.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore

**Rule 251A4**
**CP 2210**

**Subcommittee Recommendation:** Accept in principle.

Revise Rule 251A2 as follows:

2. In determining wind loads on a ~~bare-stranded~~ conductor or ~~multiconductor~~ cable, without ice covering, the assumed projected area shall be …

Revise Rule 251A3 as follows:

A. An appropriate mathematical model shall be used to determine the wind and weight loads on ice coated conductors and cables. In the absence of a model developed in accordance with Rule 251A4, the following mathematical model shall be used:
   a. On a conductor, lashed cable, or multiple-conductor cable, the coating of ice shall be considered to be a hollow cylinder touching the outer strands of the conductor or the outer circumference of the lashed cable or multiple-conductor cable.
   b. On bundled conductors, the coating of ice shall be considered as individual hollow cylinders around each subconductor.

**Vote on Subcommittee Recommendation:**

**Subcommittee Comments:**

Affirmative: Bingel, Clapp Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 252C4**
**CP 2152**

**Subcommittee Recommendation:** Accept as modified.

Remove the sentence “Guying or bracing may be required in one or both directions.”

**Vote on Subcommittee Recommendation:**

Affirmative: Affirmative: Bingel, Clapp Clem, Denbrock, DeSantis, Freimark, J. Hanson, Heald, Kempner, Kluge, McGee, Rempe, Slavin, D. Hanson, Jones, Madore

Negative: Davidchik, , Fuller, Harrel, Hensel, Peters, Shultz, Wong
Abstention:

**Explanation of Vote:**
**Davidchik:** The note is simply editorial and does not add substantive value to the existing rule**.**
**Harrel, Peters, Shultz:** The proposal is without merit. We don't believe we can prevent unknowledgeable individuals from making uninformed decisions. The CP also has not support provided.

**Rule 252A**
**CP 2263**

**Subcommittee Recommendation:** Reject. See CP 2309.

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative: Clapp
Abstention:

**Explanation of Vote:**

**Table 253-1**
**TIA**
Motion passed to approved the revised Table 253-1 submitted as a TIA and a CP as a result of a Memphis meeting. The change would replace the present 1.50 Overload Factor for Rule 250B vertical loads with 1.90 and a FN6 designator. A new FN 6 would read: "For metal and prestressed concrete structures and crossarms, guys, foundations, and anchors, use a value of 1.50"

**Vote on Subcommittee Recommendation:**

Affimative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore

**Table 253-1**
**CP 2219**

**Subcommittee Recommendation: Accept in principle.**

**Add a new footnote 6 to read:**
**[6]For fiber-reinforced composite structures and crossarms, use a value of 1.50. Apply (3 times) to values 1.30 in Table 253-1.**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 253**
**CP 2224**

**Subcommittee Recommendation:** Reject**.**

**Subcommittee Comments:** Supporting data is not provided.

**Vote on Subcommittee Recommendation:**

Affirmative: All except Peters
Negative:
Abstention: Peters

**Explanation of Vote:**
**Peters:** I agree with the proposal in principle with separating/removing reinforced concrete from wood. RC should not be treated the same as prestressed concrete so CP was not approved. However, RC strength should be treated as specified in the appropriate ACI codes which are not applicable for wood. Conversely, wood standard are not applicable for RC.
**Harrel:** This CP would remove "reinforced concrete" from the same category as wood in loading provisions of Rule 253. A statement is provided that quality control standards are the same for reinforced and prestressed concrete poles. No technical support is included. Quality control during production is not the issue. The mechanical behavior of the two products is different. Cracking, which is not uncommon in reinforced concrete, can initiate deterioration. Because prestressing does not allow cracks in prestressed concrete to remain open, and because the closed cracks tend to chemically seal, similar degradation is unlikely to be a problem with prestressed poles.There are significantly different mechanical behavior characteristics associated with prestressed and reinforced concrete. When a cracked prestressed pole returns to its normal position, the crack will close and typically reseal. Therefore there is no reduction in strength. When a reinforced pole is cracked, it will not reseal and steel deterioration will result.

**Table 253-1**

**CP 2225**

**Subcommittee Recommendation:** Reject. See CP 2324.

**Vote on Subcommittee Recommendation:**

Affirmative: all except Peters
Negative:
Abstention: Peters

**Explanation of Vote:**
**Harrel:** This CP would remove "reinforced concrete" from the same category as wood in loading provisions of Rule 253. A statement is provided that quality control standards are the same for reinforced and prestressed concrete poles. No technical support is included. Quality control during production is not the issue. The mechanical behavior of the two products is different. Cracking, which is not uncommon in reinforced concrete, can initiate deterioration. Because prestressing does not allow cracks in prestressed concrete to remain open, and because the closed cracks tend to chemically seal, similar degradation is unlikely to be a problem with prestressed poles.There are significantly different mechanical behavior characteristics associated with prestressed and reinforced concrete. When a cracked prestressed pole returns to its normal position, the crack will close and typically reseal. Therefore there is no reduction in strength. When a reinforced pole is cracked, it will not reseal and steel deterioration will result.
**Peters**: I agree with the proposal in principle with separating/removing reinforced concrete from wood. RC should not be treated the same as prestressed concrete so CP was not approved. However, RC strength should be treated as specified in the appropriate ACI codes which are not applicable for wood. Conversely, wood standard are not applicable for RC.

**Table 253-2**
**CP 2226**

**Subcommittee Recommendation: Reject** See CP 2324.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, DeSantis, Freimark, Fuller, J. Hanson, Heald, Hensel, Kempner, Kluge, McGee, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Harrel
Abstention: Peters

**Explanation of Vote:**
**Harrel:** This CP would remove "reinforced concrete" from the same category as wood in loading provisions of Rule 253. A statement is provided that quality control standards are the same for reinforced and prestressed concrete poles. No technical support is

included. Quality control during production is not the issue. The mechanical behavior of the two products is different. Cracking, which is not uncommon in reinforced concrete, can initiate deterioration. Because prestressing does not allow cracks in prestressed concrete to remain open, and because the closed cracks tend to chemically seal, similar degradation is unlikely to be a problem with prestressed poles.There are significantly different mechanical behavior characteristics associated with prestressed and reinforced concrete. When a cracked prestressed pole returns to its normal position, the crack will close and typically reseal. Therefore there is no reduction in strength. When a reinforced pole is cracked, it will not reseal and steel deterioration will result.

**Table 253-1**
**CP 2230**

**Subcommittee Recommendation:** Accept in principle. See CP 2287.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Table 253-1**
**CP 2233**

**Subcommittee Recommendation: Accept**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Table 253-1**
**CP 2287**

**Subcommittee Recommendation: Accept.**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Table 253-1**
**CP 2284**

**Subcommittee Recommendation: No Action Required**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Rule 253, Table 253-2**
**CP 2384**

**Subcommittee Recommendation: Accept in Principle: See action taken on CP2233**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 254**
**CP 2300**

**Subcommittee Recommendation: Accept.**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Table 254-1**
**CP 2300**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Rule 260C**
**CP 2247**

**Subcommittee Recommendation:** Reject**.**

**Subcommittee Comment:** Points 1 and 2 are design issues specified by material. Point 3—Preservative addition is a good idea, but not practical.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Clapp
Abstention:

**Explanation of Vote:**

**Rule 260A**
**CP 2289**

**Subcommittee Recommendation:** Reject**.**

**Subcommittee Comment:** Predicting the deformation of foundations for guys and anchors is impractical for transmission and distribution structures.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clem, Davidchik, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Clapp
Abstention:

**Explanation of Vote:**

**Rule 260A1**
**CP 2290**

**Subcommittee Recommendation:** Reject**.**

**Subcommittee Comment:** The present Code language is adequate.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, , Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Clapp
Abstention: Kluge

**Explanation of Vote:**
**Kluge:** I can accept either wording.

**Rule 260B3**
**CP 2364**

**Subcommittee Recommendation:** Accept in principle as a Note to be placed in Rule 260B.

Note: The latest edition of the following documents are among those available for determining structure design capacity with the specified NESC loads, overload factors, and strength factors:

ANSI/ASCE-10, Design of Latticed Steel Transmission Structures
ASCE-91, Design of Guyed Electrical Transmission Structure
ASCE-PCI, Guide for the Design of Prestressed Concrete Poles
ASCE-72, Design of Steel Transmission Pole Structures
PCI, Design Handbook-Precast and Prestressed Concrete

ACI-318, Building Code Requirements for Structural Concrete
IEEE 751, Trial-Use Design Guide for Wood Transmission Structures
AISI, Specification for the Design of Cold-Formed Steel Structural Members
The Aluminum Association, Aluminum Design Manual

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 261A1f**
**CP 2369**

**Subcommittee Recommendation:** Reject. See CP 2364.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 261A1a, A1c, A2a**
**CP 2153**

**Subcommittee Recommendation:** Accept in principle. Delete the last sentence of Rule 261A1c; no other changes to Rule 261A are required. See action taken on CP 2363.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rules 261H1, 261J, 261L2a and 263E1a(2)**
**CP 2154**

**Subcommittee Recommendation:** Accept. Delete Tables 261-3 and 261-4 and Rules 261H1 and modify Rule 261J, 261L2a and 263E1a(2) as follows:

J. Open-Wire Communication Conductors
Open-wire communication conductors in Grade B or C construction shall have the tensions and sags in Rule 261H2 for supply conductors of the same grade~~, and shall have sizes not less than those in Table 261-4.~~
The exception is retained.

261L2a
Grade B: Sizes and sags shall be not less than those in Rule~~s 261H1 and~~ 261H2 for supply conductors of similar grade.

263E1a(2)
Sizes shall not be smaller than 8 AWG ~~required for Grace C (Rule 261H1).~~

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**
**Heald:**

**Table 263-3, 263-4**
**CP 2154**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Table 261-1A, FN2**
**CP 2180**

**Subcommittee Recommendation:** Reject**.**

**Subcommittee Comment:** The original wording is adequate.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clem, Davidchik, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong; D. Hanson, Madore
Negative: Clapp, Jones
Abstention:

**Explanation of Vote:**
**Clapp:** The original wording allows less than the design load which is inadequate.
**Jones:** The wording should not allow for replacements to be less than the design load.

**Rule 261A1**
**CP 2220**

**Subcommittee Recommendation:** Accept in principle.

Create a new Rule 261A3 as follows and renumber existing 261A3 and 4:

3. Fiber-Reinforced Composite Structures
a. These structures shall be designed to withstand the loads in Rule 252 multiplied by the appropriate overload factors in Table 253-1 or Table 253-2 without exceeding the permitted load.
b. The permitted load shall be the strength multiplied by the strength factors in Tables 261-1A or 261-1B (where guys are used, see Rule 261C.)
c. All structures including those below 18 m (60 ft) shall be designed to withstand, without conductors, the extreme wind load in Rule 250C applied in any direction on the structure. A gust factor appropriate for the wind pressure and structure height should be considered.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 261C1**

**CP 2221**

**Subcommittee Recommendation: Accept in principle.**

**Create a new rule 261C3 as follows:**

**3. Fiber-Reinforced Composite Structures**
**When guys are used to meet the strength requirements, they shall be considered as taking the entire load in the direction in which they act, the structure acting as a strut only, except for those structures considered to possess sufficient rigidity so that the guy can be considered an integral part of the structure.**

***NOTE:*** **Excessive movement of guys may reduce clearances or structure capacity.**

**Add New Rule 261D3:**

3. **Fiber-Reinforced Composite Crossarms and Braces**
Crossarms and braces should meet the strength requirements of Rule 261D2.

**Renumber subsequent clauses D3 and D4.**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Table 261-1A**
**CP 2222**

Subcommittee Recommendation: Accept in principle.

(Secretary Note: The table heading in the CP is incorrect; should be Table 261-1A, not 253).

Revise Table 261-1A as shown below:

**Table 261-1A**

**Strength Factors for Structures,**[1] Crossarms, Guys, Foundations, and Anchors for Use with Overload Factors of Table 253-1

| | **Grade B** | **Grade C** |
|---|---|---|
| **Strength factors for use with loads of Rule 250B** | | |
| Metal and Prestressed-Concrete Structures | 1.0 | 1.0 |
| Wood and Reinforced-Concrete Structures[2, 4] | 0.65 | 0.85 |
| Fiber-reinforced composite structures | 0.65 | 0.85 |
| Guy Wire[5] | 0.9 | 0.9 |
| Guy Anchor and Foundations | 1.0 | 1.0 |
| **Strength factors for use with loads of Rule 250C** | | |
| Metal and Prestressed Concrete Structures | 1.0 | 1.0 |
| Wood and Reinforced Concrete Structures[3, 4] | 0.75 | 0.75 |
| Fiber-reinforced composite structures | 0.75 | 0.75 |
| Guy Wire[5] | 0.9 | 0.9 |
| Guy Anchor and Foundations | 1.0 | 1.0 |

**Table 261-1a**
**CP 2227**

**Subcommittee Recommendation: Reject. See CP 2224 and CP 2225.**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, , Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention: Peters

**Explanation of Vote:**
**Peters:** I agree with the proposal in principle with separating/removing reinforced concrete from wood. RC should not be treated the same as prestressed concrete so CP was not approved. However, RC strength should be treated as specified in the appropriate ACI codes which are not applicable for wood. Conversely, wood standard are not applicable for RC.

**Table 261-1B**
**CP 2228**

**Subcommittee Recommendation: Reject. See CP 2224 and CP 2225.**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, , Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention: Peters

**Explanation of Vote:**
**Peters:** I agree with the proposal in principle with separating/removing reinforced concrete from wood. RC should not be treated the same as prestressed concrete so CP was not approved. However, RC strength should be treated as specified in the appropriate ACI codes which are not applicable for wood. Conversely, wood standard are not applicable for RC.

**Table 261-1a**
**CP 2234**

**Withdrawn**

**Table 261-1A, Footnote 2, 3**
**CP 2238**

**Subcommittee Recommendation: Accept in principle. See CP 2368.**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 261**
**CP 2241**

**Subcommittee Recommendation: Accept in principle and full acceptance contingent upon publication of ANSI O5.1, O5.2 and O5.3.**

**Subcommittee Comment:** This subcommittee has members who also serve on the ANSI O5 Committee. We recognize the significance of proposed changes to ANSI O5 that may need to be reflected in the manner shown in this proposal by the ANSI O5 committee. These proposed NESC changes will be out for public review at the same time that the ANSI O5 proposed changes are available for review. We request comments on the appropriateness of making this change to recognize the values that will be in the next

ANSI O5 set of standards. A final determination on this CP will be made after review of comments and ANSI O5.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Slavin, D. Hanson, Jones, Madore
Negative: J. Hanson, Shultz, Wong
Abstention:

**Explanation of Vote:**

**J. Hanson, Shultz:** We do not know what will be final changes in upcoming revision of ANSI O5.1. I believe a decision to revise the NESC without knowing these details is premature.

**Rule 261B**
**CP 2265**

**Subcommittee Recommendation: Reject.**

**Subcommittee Comment:** Predicting the deformation of foundations for guys and anchors is impractical for transmission and distribution structures.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Clapp
Abstention:

**Explanation of Vote:**

**Rule 261H3**
**CP 2266**

**Subcommittee Recommendation: Reject.**

**Subcommittee Comment:** There is no practical reason to reduce the design strength for Grade C splices.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 261I**
**CP 2267**

This proposal has been withdrawn.

**Rule 261K**
**CP 2268**

**Subcommittee Recommendation:** Reject**.**

**Subcommittee Comment:** The wording as currently specified is adequate.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong; D. Hanson, Madore
Negative: Clapp, Heald, Jones
Abstention:

**Explanation of Vote:**

**Jones**: The proposed wording is more clear.

**Rule 261A, B**
**CP 2289**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Rule 261A1c**

**CP 2291**

**Subcommittee Recommendation:** Accept in principle. See CP 2306 and CP 2363.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, McGee, Rempe, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Kluge, Peters, Shultz
Abstention:

**Explanation of Vote:**
**Kluge**: No supporting comments given for adding a new Rule 261A2f. Rule 250C already exempts all structures 60 foot or less in height, irrespective of the structure materials.
Rule 261A1c was placed into the Code for manufactured structures that may not be capable of standing alone (without conductors or guys). Wood poles, as naturally grown, are capable of standing alone.
Therefore, this change does not accomplish anything of substance. There are other change proposals that conceptually are more acceptable (e.g., CP 2151 with some modifications for Grade C and attention to other related CPs).
**Peters**: We cannot ascertain why Rule 261A1c was originally placed into the NESC for metal prestressed and reinforced concrete structure and therefore cannot justify extending the requirements to wood structures.

**Rule 261I**
**CP 2292**

This change proposal is withdrawn.

**Rule 261K**
**CP 2293**

**Subcommittee Recommendation: Accept.**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention: Heald

**Explanation of Vote:**

**Rule 261H3c, M**
**CP 2300**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Section 25, 26**
**CP 2372**

**Subcommittee Recommendation:** Accept in principle

Working Group 5.2 will revise the proposal by March 1, 1999. The members are Peters (chair), Bingel, Clem, DeSantis, Freimark, Harrel, Heansel, Kempner, Kluge, McGee, Slavin, Wong, and non-members of SC5 Rojas, Amrhyn, Kientz

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Fuller, J. Hanson, Harrel, Shultz,
Abstention: Heald

**Explanation of Vote:**

**Clapp:** I believe that it is appropriate to bring the specifications in Sections 24, 25, and 26 into harmony with structural design methodologies in common use.

**J. Hanson & Fuller & Shultz:** I do not agree with the proposal to use the current ASCE-7 ice map as modified. A map in the commentary is not considered part of the Standard. Even without Mr. Peter's modifications.

The ASCE committee did not think the map is good enough to add to their Standard. Why should SC5 adopt the map.

Also, the map has too many "holes" to be use full and different methodologies were used for the Pacific Northwest and Mr. Peters modifications.

Without an acceptable ice map the CP should not be approved**.**

**Rule 261A1c**
**CP 2363**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Rule 261A1e**
**CP 2365**

**Subcommittee Recommendation: Accept as modified**

**Add new Rule 261A1d to read as follows**

Spliced and Reinforced Structures

Reinforcements or permanent splices on a supporting structure are permitted provided they develop the required strength.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 261A1d**
**CP 2366**

This change proposal was withdrawn by the submitter.

**Rule 261A2e**

**CP 2367**

**Subcommittee Recommendation:** Reject

**Subcommittee Comment:** The current wording is adequate.

**Vote on Subcommittee Recommendation:**

Affirmative: Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Slavin, Wong, D. Hanson, Jones, Madore
Negative: Bingel, Shultz
Abstention: Rempe

**Explanation of Vote:**
**Rempe:** Neither the current rule or the CP are clear. They are not consistent with the intent of the code.

**Bingel:** The intent and proper application of this rule are unclear. Some interpretations can result in unsafe installations. If the proposal wording does not achieve clarity of the intentions of the rule, it should be modified to clear the issue.

**Table 261-1A**
**CP 2368**

**Subcommittee Recommendation:** Accept in principle. Add new footnote 6 to all materials not covered by footnotes 2 and 3.

**Table 261-1A**
**Strength Factors for Structures,**[1] Crossarms, Guys, Foundations, and Anchors for Use with Overload Factors of Table 253-1

| | **Grade B** | **Grade C** |
|---|---|---|
| **Strength factors for use with loads of Rule 250B** | | |
| Metal and Prestressed-Concrete Structures[6] | 1.0 | 1.0 |
| Wood and Reinforced-Concrete Structures[2, 4] | 0.65 | 0.85 |
| Guy Wire[5, 6] | 0.9 | 0.9 |
| Guy Anchor and Foundations [6] | 1.0 | 1.0 |
| **Strength factors for use with loads of Rule 250C** | | |
| Metal and Prestressed Concrete Structures [6] | 1.0 | 1.0 |
| Wood and Reinforced Concrete Structures[3, 4] | 0.75 | 0.75 |
| Guy Wire[5, 6] | 0.9 | 0.9 |
| Guy Anchor and Foundations [6] | 1.0 | 1.0 |

[1] Includes poles.

[2] Wood and reinforced concrete structures shall be replaced or rehabilitated when deterioration reduces the structure strength to 2/3 of that required when installed. If a structure is replaced, it shall meet the strength required by Table 261-1A. Rehabilitated portions of structures shall have strength greater than 2/3 of that required when installed.
[3] Wood and reinforced concrete structures shall be replaced or rehabilitated when deterioration reduces the structure strength to 3/4 of that required when installed. If a structure is replaced, it shall meet the strength required by Table 261-1A. Rehabilitated portions of structures shall have strength greater than 3/4 of that required when installed.
[4] Where a wood or reinforced concrete structure is built for temporary service, the structure strength may be reduced to values as low as those permitted by footnotes (2) and (3) provided the structure strength does not decrease below the minimum required during the planned life of the structure.
[5] For guy insulator requirements, see Rule 279.

[6]<u>Deterioration during service shall not reduce strength capability below the required strength.</u>

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Table 261-1A**
**<u>CP 2384</u>**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Rule 264E**
**<u>CP 2133</u>**

**Subcommittee Recommendation:** Reject

**Subcommittee Comment:** The present language used is appropriate. Placing guy markers at all locations is not appropriate. There are many places where a guy marker would serve no purpose.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 264D**
**CP 2269**

**Withdrawn by the originator**

**Rule 264D**
**CP 2294**

**Subcommittee Recommendation:** Accept

Sec. Note: Last sentence has typo change “guts” to “guys”

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 270**
**CP 2240**

**Subcommittee Recommendation: Accept as Modified**

Revise the proposed Note 2b to Rule 277 to read as follows.

> b) For composite insulators, the manufacturer’s “specified cantilever load” for cantilever or “specified mechanical load” for tension, per IEEE Guide 2834.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 272**
**CP 2240**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Table 273-1**
**CP 2243**

**Subcommittee Recommendation: Accept**

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 276**
**CP 2286**

**Subcommittee Recommendation:** Accept

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 277**
**CP 2232**

**Subcommittee Recommendation**: Accept in part

Accept the typographical correction of "toughened". Change dates as follows: ANSI C29.1-1993, ANSI C29.7-1996 and ANSI C29.9-1998.

**Subcommittee Comments**: Reject all other changes; they are not appropriate according to manufacturers recommendations.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
Negative:
Abstention:

**Explanation of Vote:**

**Rule 277**
**CP 2232**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Rule 277**
**CP 2240**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Rule 279A2 Exception 2**
**CP 2134**

**Subcommittee Recommendation:** Accept in Principle

**Subcommittee Comments:** This language was added as a result of 1997 change proposal 1809 on pages 175 and 176 of the preprint. What is shown on page 171 of the 1997 NESC as exception 2 to Rule 279A2a is misplaced. It should be the only exception under new Rule 279A2b(2). What is presently shown as exception 1 Rule 279A2a is the only exception to that rule. This correction will be shown on the next NESC errata sheet.

**Vote on Subcommittee Recommendation:**

Affirmative: Bingel, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Shultz, Slavin, Wong; D. Hanson, Madore

Negative: Clapp, Rempe, Jones
Abstention:

**Explanation of Vote:**
**Clapp, Rempe & Jones:** We don't believe this action addresses the change proposal.

**Rule 279A1b**
**CP 2270**

**This CP was withdrawn by the submitter.**

**Rule 279A1b**
**CP 2295**

**Subcommittee Recommendation:** Reject

**Subcommittee Comments:** Supporting comments are not adequate to justify the change.

**Vote on Subcommittee Recommendation:**

**Affirmative**: Bingel, Clem, Davidchik, , DeSantis, Freimark, Fuller, J. Hanson, Harrel, Hensel, Kempner, Kluge, McGee, Peters, Shultz, Slavin, Wong, D. Hanson, Jones, Madore
**Negative**: Clapp, Denbrock, Heald, Rempe
**Abstention**:

**Explanation of Vote:**

**Definition**
**Fiber-optic**
**CP 2216**

**Subcommittee Recommendation:**

**Vote on Subcommittee Recommendation:**

Affirmative:
Negative:
Abstention:

**Explanation of Vote:**

**Part 2**
**CP 2169**

Withdrawn by submitter

For the 2007 Edition, Subcommittee 5 request that a Working Group be set up under Subcommittee 1 to investigate the appropriateness of adding requirements for when and how to mark overhead lines and structures for increased visibility to aviation traffic.

**IR 479**

At the meeting, the subcommittee decided that no change of the rule is required. Subsequently, Slavin and Freimark developed a proposal to clear up the wording. The proposal was provided to each member and subsequently voted as follows.
----Please review the attached proposal and provide your vote and/or remarks to Allen Clapp by January 7, 1999 at allen@clappresearch.com.

**IR 496**
Should be IR 472 and should be referred to Subcommittee 4.

**IR 508**
No action required.

**Motion** that Subcommittee 5 requests that ANSI C2 create a formal liaison with the ASCE with the purpose of coordinating the ANSI standards developments and jurisdiction for overhead lines and structures.

**Vote on Subcommittee Recommendation:**
Affirmative: Bingel, Clapp, Clem, Davidchik, Denbrock, DeSantis, Freimark, Fuller, J. Hanson, Harrel, Heald, Hensel, Kempner, Kluge, McGee, Peters, Rempe, Shultz, Slavin, Wong, D. Hanson, Jones, Madore

**9.0 Next Meetings of Working Groups and Tasks Forces:**

Subcommittee 5: 10-11 April 1999 - New Orleans

**9.1 Active Working Groups and Task Forces**

**9.1.1 WG 5.1; Kempner (chair)—Continuity of Sections 24, 25 and 26**
**9.1.1.1 TF 5.1.1 disbanded**
**9.1.1.2 TF 5.1.2 disbanded**
**9.1.1.3 TF 5.1.3 disbanded**
**9.1.1.4 TF 5.1.4 disbanded**
**9.1.1.5 TF 5.1.5 disbanded**
**9.1.1.6 TF 5.1.6 disbanded**
**9.1.1.7 TF 5.1.7 disbanded**
**9.1.1.8 TF 5.1.8 disbanded**
**9.1.1.9 TF 5.1.9 Kempner (chair) Seismic**
**9.1.2 WG 5.2 Peters (chair) Total new NESC Sections 24-26**
**9.1.3 WG 5.6 Pinkham (chair) Line insulation**
**9.1.3.1 TF 5.6.1 Pinkham (chair) Coordinate changes**
**9.1.3.2 TF 5.6.2 disbanded**

Secretary Note:
Request to include Dr. Dagher's and Mr. Rollins' papers into the Preprint.

**LETTER BALLOT**
**FOR MEMBERS WHO <u>WERE</u> PRESENT AT THE MEETING**

Date Issued:_____ Date Due:_____

NESC Subcommittee_____

Recommendations Made at Meeting on_____

❑I reaffirm my votes, as cast at the meeting of NESC Subcommittee _____,

on _____, on all recommendations made by the majority of the

members present at the meeting, except as follows:

❑No Exception

❑Rule _____ Change Proposal_____

Comments_____

_____

_____

❑Rule _____ Change Proposal_____

Comments_____

_____

_____

❑Rule _____ Change Proposal_____

Comments_____

_____

_____

Return to: Secretary, NESC Subcommittee_____

_____ _____

Name (Please Print) Signature

_____

Date

**LETTER BALLOT**
**FOR MEMBERS WHO <u>WERE NOT</u> PRESENT AT THE MEETING**

Date Issued:_____ Date Due:_____

NESC Subcommittee_____

Recommendations Made at Meeting on_____

❑I vote in the affirmative on all recommendations made by the majority of the members present at the meeting of NESC Subcommittee ____ on _____, except as follows:

❑No Exception

❑Rule _____ Change Proposal_____

Comments_____

_____

_____

❑Rule _____ Change Proposal_____

Comments_____

_____

_____

❑Rule _____ Change Proposal_____

Comments_____

_____

_____

Return to: Secretary, NESC Subcommittee_____

_____ _____

Name (Please Print) Signature

_____

Date

# CHANGE PROPOSAL FOR THE 2002 NATIONAL ELECTRIC SAFETY CODE

**From: Lawrence M. Slavin** **Tuesday, October 27, 1998**
**(& Bruce Freimark, AEP)**

**Bellcore** **Tel: 973-829-4330**
**445 South Street, Room 1J-136G** **FAX: 973-829-5965**
**Morristown, NJ 07866**
**lslavin@notes.cc.bellcore.com**

Representing: NESC SC5

**1. Rule:** Tables 261-1A **1997 NESC page No.:** 163

**2. Proposal:**

**Revise footnotes of Table 261-1A as follows:**

**Table 261-1A:**

[1] Includes poles.

[2] Wood and reinforced concrete structures shall be replaced or rehabilitated when deterioration, or increased loading, reduces the structure strength to 2/3 of ~~that~~ the strength required ~~when installed~~ to support the existing loads as determined by multiplying the loads from Rule 250B by the overload factors in Table 253-1 and the application of the appropriate strength factor from Table 261-1A, above. If a structure is replaced, it shall meet 100% of the strength required ~~by Table 261-1A~~. Rehabilitated portions of structures shall have strength greater than 2/3 of that required ~~when installed~~.

[3] Wood and reinforced concrete structures shall be replaced or rehabilitated when deterioration, or increased loading, reduces the structure strength to 3/4 of ~~that~~ the strength required ~~when installed~~ to support the existing loads as determined by multiplying the loads from Rule 250C by the overload factors in Table 253-1 and the application of the appropriate strength factor from Table 261-1A, above. If a structure is replaced, it shall meet 100% of the strength required ~~by Table 261-1A~~. Rehabilitated portions of structures shall have strength greater than 3/4 of that required ~~when installed~~.

[4] Where a wood or reinforced concrete structure is built for temporary service, the initial structure strength may be reduced to values as low as those permitted by footnotes (2) and (3) provided the structure strength, during the planned life of the structure, does not decrease below the minimum required to support the existing loads as determined by multiplying the loads from Rule 250B by the overload factors in Table 253-1 and the application of the appropriate strength factor from Table 261-1A, above ~~during the planned life of the structure~~.

[5] For guy insulator requirements, see Rule 279.

### 3. Statement of Problem and Supporting Comments:

**The present footnotes of Table 261-1A including comments referring to 2/3 (or 3/4) of the strength "required when installed" are not clear as to whether referring to**

**(1) a strength degradation corresponding to when the section modulus has diminished to 2/3 (or 3/4) of the original section modulus, when the pole was initially installed, regardless of the loading,**

**or**

**(2) the section modulus required to withstand 2/3 (or 3/4) the existing loading adjusted by the by appropriate overload and strength factors, regardless of the present state of pole degradation and modulus reduction.**

**This confusion is similar to that addressed by Interpretation Request IR 479, albeit regarding Table 261-3B which is no longer present in the 1997 NESC. Although the interpretation provided in the response to IR 479 clarifies the issue, it does not remove the need to re-word the present footnotes to avoid unnecessary confusion by other users.**

In particular, the emphasis on the word "deterioration" and the term "when installed" in the present footnotes would suggest that interpretation (1) would be correct, although -- based upon IR 479 --interpretation (2) is, in fact, correct. The proposed wording attempts to remove this confusion.

**Signature** _____