

NESC© 2007 Edition Revision Process

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NESC SUBCOMMITTEE 5
OVERHEAD LINES - STRENGTH AND LOADING
27 Sep, 2005-29 Sep, 2005
IEEE, Piscataway, NJ

Name	Organization	09/27	09/28
Richard Aichinger (Alternate)	AISI	X	X
Julian Ajello (Principal)	NARUC	A	A
Alan J Amato (Principal)	SCTE	A	A
Christopher Austin (Alternate)	NCTA	A	A
Nelson G Bingel (Principal)	AWPA	X	A
Rex Bullinger (Principal)	NCTA	X	X
Terry Burley (Alternate)	WAPA	X	X
John Busel (Principal)	ACMA	A	A
Jim Byrne (Principal)	NRECA	A	A
Helen Chen (Principal)	AISI	X	X
Allen L Clapp (Principal)	Self	X	X
Clayton L Clem (Principal)	TVA	X	X
Ron Corzine (Alternate)	SEEX	X	X
Frank A Denbrock (Principal)	IEEE/PES/T&D	X	X
Bruce Freimark (Principal)	EEI	X	X
Robert S Fuller (Principal)	NSPE	X	X
Douglas Hanson (Principal)	WAPA	A	A
Edward Harrel (Principal)	EEI	A	A
Donald G Heald (Principal)	RUS	X	X
Richard W Hensel (Principal)	IEEE	A	A
Walter D Jones (Principal)	IEEE/IAS	A	A
Jacob Joplin (Alternate)	NCEMC	X	X
Leon Kempner (Principal)	BPA	X	X
Jim Kinghorn (Principal)	NCEMC	A	A
Robert O Kluge (Principal)	EEI	X	X
Brian Lacoursiere (Alternate)	ACMA	X	X
Robert Lash (Alternate)	RUS	A	A

Daniel Lonergan (Alternate)	AMCA	X	X
Steve Mace (Alternate)	NCTA	A	A
Joseph Muccilo (Principal)	EIA	A	A
Michael C Pehosh (Alternate)	NRECA	X	X
Robert C Peters (Principal)	IEEE	X	X
Joseph Rempe (Principal)	APPA	A	A
Andrew Schwalm (Principal)	IEEE	A	A
Wade Shultz (Principal)	SEEX	X	X
Lawrence M Slavin (Principal)	ATIS	A	A
Donald Soderberg, Jr. (Alternate)	IEEE	X	X
Richard J Standford (Principal)	EEI	X	X
Jose L Vivas (Principal)	EEI	X	X
C. Jerry Wong (Principal)	EEI	X	X
Ted S Woo (Alternate)	SCTE	A	A
Alan T Young (Alternate)	EIA	A	A

Guest

William Ash		X	X
Jim Davison		X	A
Gregory Obenchain	EEI	A	A
Dave Young	EEI	X	X

Chair: Frank Denbrock X - Present

Secretary: Allen Clapp A - Absent

Meeting Note: CP2654 was "Accpeted in Principle" by modifying CP 2787. If SC1 passes CP2654. The modified version of CP2787 would be accepted.

IR 538 was reviewed and was voted that no action was needed.

New Text

Part: 2 Section: 25 **CP2737**

Also Part:2 Section:26 **SC5**

Part:2 Section:27 **SC5**

CM4015 mark konz SEE

Entire CP

CM4017 Jane Cooke Santee Cooper

Entire CP

CM5052 Jeffrey Hartenberger Ameren Services

Entire CP

- CM4049 Albert Zogopoulos** Unitil Service Corp.
Entire CP
- CM4059 Paul Krell** Unitil
Entire CP
- CM4069 Jacob Dusling** Unitil
Entire CP
- CM4079 Scott harding** Unitil
Entire CP
- CM4089 Mike Busby** Unitil
Entire CP
- CM4090 Phil Morse** Central Vermont Public Service Corp.
Part:2 Section:25
- CM4102 John Bonazoli** Unitil
Entire CP
- CM4104 Phil Morse**
Entire CP
- CM4105 Phil Morse**
Part:2 Section:25
- CM4118 Scott Shepard** Unitil
Entire CP
- CM4129 Scott Shepard** SS Utility Solutions, PLLC
Entire CP
- CM4138 Justin Eisfelleer** Unitil Service Corp.
Entire CP
- CM4149 Kevin Sprague** Unitil Service Corp.
Entire CP
- CM4157 Scott Shepard** SS Utility Solutions, PLLC
Entire CP
- CM4169 James Goudreault** Unitil
Entire CP
- CM4179 Albert Zogopoulos** Self
Entire CP
- CM4191 nathan sherwood** Unitil
Entire CP
- CM4201 Jim Kinghorn** Cape Hatteras Electric Cooperative
Part:2 Section:25
- CM4226 Thomas Pritchard** Jones Onslow EMC
Part:2 Section:25
- CM4265 Ron Corzine** Savannah Electric
Entire CP
- CM4267 Harold Murphy** Wake Electric (Rural Electric Cooperative)
Entire CP
- CM4288 Gregory Obenchain** Edison Electric Institute
Entire CP
- CM4408 Barney Drake**
Entire CP
- CM4320 Tom Meissner** Unitil
Entire CP
- CM4338 J. Reed Cooper** Horry Electric Cooperative
Entire CP
- CM4372 Charles Faulds** Tex
Entire CP
- CM4401 Robert Higbe** Santee Electric Cooperative, inc.
Entire CP

CM4456 James T Collins Southeastern Electric Exchange
Entire CP

CM4496 A.C. Channaiah AEP
Entire CP

CM4510 Rob Ardis Pee Dee Electric Cooperative, Inc.
Entire CP

CM4516 Ronnie Gunnell Randolph Electric Membership Coperation
Entire CP

CM4518 Thomas Haire Rutherford EMC
Entire CP

CM4521 Dennis Mabe Randolph Electric Membership Corporation
Entire CP

CM4526 EDWARD THOMAS Utility Electrical Consultants, PC
Entire CP

CM4530 J Frederick Doering Self
Entire CP

CM4541 Robert Wilbur Mid-Carolina Electric Cooperative, Inc.
Entire CP

CM4554 Jimmy Lanier Randolph Electric Membership Corporation
Entire CP

CM4567 Charles A. Blackmon Blue Ridge Electric Cooperative, Inc.
Entire CP

CM4578 David Sofra
Entire CP

CM4605 A. Berl Davis, Jr.
Entire CP

CM4618 Jason Merchant ECSC Engineering Association
Entire CP

CM4619 Christopher Fettes
Entire CP

CM4663 Monroe Phil Lynches River Electric Cooperative
Entire CP

CM4669 Mickey Gunter Georgia Power Company (Retired)
Entire CP

CM4700 thomas black fairfield electric cooperative
Entire CP

CM4726 Tommy King Jackson EMC
Entire CP

CM4764 Pete Montes Farmers Electric Cooperative, Inc.
Entire CP

CM4768 Michael Hyland American Public Power Association
Entire CP

CM4787 Robert Ott Tri-county Electric Cooperative
Entire CP

CM4806 Joe Costello
Entire CP

CM4812 McCachern Steven
Entire CP

CM4822 Jeffrey Ahearn
Entire CP

CM4825 Kenneth Miller Electric Council of the Northeast
Entire CP

CM4828 David Chaudoir
Entire CP

- CM4838 Jacob Joplin** Carteret-Craven Electric Cooperative
Entire CP
- CM4841 Ryan Smoak** McCall-Thomas Engineering
Entire CP
- CM4853 Tom Myers**
Entire CP
- CM4870 Tim Mobley**
Entire CP
- CM4873 Gonzalez Gabriel** BellSouth Telecommunications
Entire CP
- CM4875 Shaw Lewis**
Entire CP
- CM4900 Donald Soderberg**
Entire CP
- CM4902 Terry Williams** ECSC
Part:2 Section:27
- CM4906 Jerry McMullan** Florida Power & Light Company
Entire CP
- CM4935 Bradley Schmidt** Cass County Electric Cooperative, Inc.
Entire CP
- CM4938 Robert Harris** Four County Electric Membership Corporation
Entire CP
- CM4949 Steve West** Portland General Electric
Part:2 Section:25
- CM4951 Anthony Barrow** Pitt and Greene Electric Membership Corporations
Entire CP
- CM4975 Keith Reese** Georgia Power Company
Part:2 Section:25
- CM4976 Keith Reese** Georgia Power Company
Part:2 Section:25
- CM4978 Keith Reese** Georgia Power Company
Part:2 Section:25
- CM4985 Dana Hale** Maine Public Service Company
Entire CP
- CM4993 Michael Wood** South River Electric Membership Corporation
Entire CP
- CM5053 Rex Bullinger** NCTA
Entire CP

Subcommittee Recommendation: Reject

Subcommittee Comment:

Lack of correlation with todays loads in certain parts of the country.

Vote on Subcommittee Recommendation:

Affirmative: (16) Bingel, Bullinger, Burley, Clem, Denbrock, Freimark, Harrel, Jones, Joplin, Kluge, Rempe, Shultz, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (4) Clapp, Kempner, Peters, Slavin

Abstention: (5) Fuller, Heald, Pehosh, Chen, Lonergan

Explanation of Vote:

Chen - I voted abstention on this CP2737 because I believe that extreme wind load below 60 feet should be

considered. However, the comments that debris may be the major concern for utility poles below 60 feet in some areas could also be considered.

Clapp - It is time to start the changes for the future; we have put it off too long, especially with a 5-yr cycle.

Fuller - Very sweeping change to substantial part of the code. Every discussion brings up conflicting data about its validity. Much of validity seems to stem from separation debate above 60' exclusion. Once 60' exclusion is included this issue should be re-examined.

Kempner - Working Group 5.2 was charged with rewriting the loading and strength requirements of the current NESC to be consistent with industry practice for reliability based design (RDB) methodology. This change is required to maintain the engineering credibility of the NESC. The rejection of the Working Group's effort will leave the NESC requirements in a non-complaint RBD format/concept when compared to new and future industry Standards and Codes.

Kluge - See also comment 4288 that further supports my vote.

Lonergan - I do not have sufficient knowledge on this subject.

Slavin - See comment by Kempner. I believe that the inclusion of the CP as an "alternate method", as originally proposed, or possibly included in the Appendix for sample usage by the industry during the next code cycle, would help further refine the method which will inevitably be reflected in the NESC rules in future editions.

Revised Text

Part: 2 Section: 25 **CP2767**

Also Part:2 Section:26 SC5

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised TextPart: 2 Section: 24 Rule: 242 Table 242-1 **CP2617****CM4350 J Frederick Doering Self**

Part:2 Section:24 242 Table 242-1

CM4711 Michael Hyland American Public Power Association

Part:2 Section:24 242 Table 242-1

CM4725 Michael Hyland American Public Power Association

Part:2 Section:24 242 Table 242-1

Subcommittee Recommendation: Accept**Subcommittee Comment:**

Remove urban and rural in Table 242-1 in all places

Vote on Subcommittee Recommendation:**Affirmative:** (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

Revised TextPart: 2 Section: 24 Rule: 242 Table 242-1& 2 **CP2826****CM4681 Michael Hyland** American Public Power Association

Part:2 Section:24 242 Table 242-1& 2

CM4721 Michael Hyland American Public Power Association

Part:2 Section:24 242 Table 242-1& 2

Subcommittee Recommendation: Accept**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

Deleted TextPart: 2 Section: 24 Rule: 242 Table 242-2 **CP2618****CM4531 J Frederick Doering Self**

Part:2 Section:24 242 Table 242-2

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 25 Rule: 250 **CP2673**

CM4046 Albert Zogopoulos Unitil Service Corp.

Part:2 Section:25 250

CM4056 Paul Krell Unitil

Part:2 Section:25 250

CM4066 Jacob Dusling Unitil

Part:2 Section:25 250

CM4076 Scott harding Unitil

Part:2 Section:25 250

CM4086 Mike Busby Unitil

Part:2 Section:25 250

CM4099 John Bonazoli Unitil

Part:2 Section:25 250

CM4115 Scott Shepard Unitil

Part:2 Section:25 250

CM4125 Scott Shepard SS Utility Solutions, PLLC

Part:2 Section:25 250

CM4134 Justin Eisfelleer Unitil Service Corp.

Part:2 Section:25 250

CM4145 Kevin Sprague Unitil Serice Corp.

Part:2 Section:25 250

CM4151 Scott Shepard SS Utility Solutions, PLLC

Part:2 Section:25 250

CM4166 James Goudreault Unitil

Part:2 Section:25 250

CM4176 Albert Zogopoulos Self

Part:2 Section:25 250

CM4190 nathan sherwood Unitil

Part:2 Section:25 250

CM4196 Jim Kinghorn Cape Hatteras Electric Cooperative

Part:2 Section:25 250

CM4198 Tom Meissner Unitil

Part:2 Section:25 250

CM4207 Timothy Croushore Allegheny Power

Part:2 Section:25 250

- CM4211 Robin Blanton** Piedmont Electic Membership Corporation
Part:2 Section:25 250
- CM4218 Anthony Eason** Electric Cooperative utility
Part:2 Section:25 250
- CM4225 Thomas Pritchard** Jones Onslow EMC
Part:2 Section:25 250
- CM4268 Ron Corzine** Savannah Electric
Part:2 Section:25 250
- CM4273 Harold Murphy** Wake Electric (Rural Electric Cooperative)
Part:2 Section:25 250
- CM4289 Gregory Obenchain** Edison Electric Institute
Part:2 Section:25 250
- CM4341 J. Reed Cooper**
Part:2 Section:25 250
- CM4375 Charles Faulds** Texas Electric Cooperatives
Part:2 Section:25 250
- CM4384 Robert Higbe** Santee Electric cooperative, Inc.
Part:2 Section:25 250
- CM4407 Barney Drake**
Part:2 Section:25 250
- CM4455 James T Collins** Southeastern Electric Exchange
Part:2 Section:25 250
- CM4490 EDWARD THOMAS** Utility Electrical Consultants, PC
Part:2 Section:25 250
- CM4498 A.C. Channaiah** AEP
Part:2 Section:25 250
- CM4508 Rob Ardis** Pee Dee Electric Cooperative, Inc.
Part:2 Section:25 250
- CM4515 Ronnie Gunnell** Randolph Electric Membership Corporation
Part:2 Section:25 250
- CM4517 Thomas Haire** Rutherford EMC
Part:2 Section:25 250
- CM4527 Jeff Loven** French Broad EMC
Part:2 Section:25 250
- CM4539 Robert Wilbur** Mid-Carolina Electric Cooperative, Inc.
Part:2 Section:25 250
- CM4553 David West** Duke Energy
Part:2 Section:25 250
- CM4560 Jimmy Lanier** Randolph Electric Membership Corporation
Part:2 Section:25 250
- CM4565 Charles A. Blackmon** Blue Ridge Electric Cooperative, Inc.
Part:2 Section:25 250
- CM4579 David Sofra**
Part:2 Section:25 250
- CM4601 A. Berl Davis, Jr.**
Part:2 Section:25 250
- CM4610 Jason Merchant** ECSC Engineering Association
Part:2 Section:25 250
- CM4615 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 250
- CM4628 Monroe Phil** Lynches River Electric Cooperative
Part:2 Section:25 250
- CM4692 thomas black** fairfield electric cooperative
Part:2 Section:25 250

- CM4727 Tommy King** Jackson EMC
Part:2 Section:25 250
- CM4755 Christopher Fettes**
Part:2 Section:25 250
- CM4783 Robert Ott** Tri-county Electric Cooperative
Part:2 Section:25 250
- CM4808 Joe Costello**
Part:2 Section:25 250
- CM4811 McCachern Steven**
Part:2 Section:25 250
- CM4826 Jeffrey Ahearn** Tideland EMC
Part:2 Section:25 250
- CM4832 Ryan Smoak** McCall-Thomas Engineering
Part:2 Section:25 250
- CM4840 Jacob Joplin** Carteret-Craven EMC
Part:2 Section:25 250
- CM4851 Tom Myers**
Part:2 Section:25 250
- CM4868 Tim Mobley**
Part:2 Section:25 250
- CM4876 Shaw Lewis** Brunswick EMC
Part:2 Section:25 250
- CM4896 Karl Keeton** VVEC
Part:2 Section:25 250
- CM4898 Benjamin Beagle** Cape Hatteras Electric Cooperative
Part:2 Section:25 250
- CM4901 Benjamin Beagle** Cape Hatteras Electric Cooperative
Part:2 Section:25 250
- CM4907 Kenneth Miller** Bangor Hydro-Electric
Part:2 Section:25 250
- CM4909 Jerry McMullan** Florida Power & Light Company
Part:2 Section:25 250
- CM4925 Jay Albright** Randolph Electric
Part:2 Section:25 250
- CM4934 Bradley Schmidt** Cass County Electric Cooperative, Inc.
Part:2 Section:25 250
- CM4939 Robert Harris** Four County Electric Membership Corp.
Part:2 Section:25 250
- CM4953 Anthony Barrow** Pitt and Greene Electric Membership Corporation
Part:2 Section:25 250
- CM4977 Keith Reese** Georgia Power Company
Part:2 Section:25 250
- CM4986 Dana Hale** Maine Public Service Company
Part:2 Section:25 250
- CM4991 Michael Wood** South River Electric Membership Corporation
Part:2 Section:25 250

Subcommittee Recommendation: Reject

Subcommittee Comment:

CP's 2766, 2673, and 2798 are rejected based on information obtained from public comments. Utility experience has demonstrated that electrical distribution and communication line structures, under 60 ft in height, are damaged during extreme wind events by trees, tree limbs, and other flying debris. Designing structures with heights less than

60 ft for extreme winds will increase pole strengths for distribution systems resulting in large increases in cost and design complexity without commensurate increase in safety. Safety of employees and the public is provided using the current NESC loading requirements.

Vote on Subcommittee Recommendation:

Affirmative: (17) Amato, Bullinger, Byrne, Clem, Denbrock, Freimark, Harrel, Kempner, Kinghorn, Kluge, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (7) Clapp, Jones, Peters, Burley, Rempe, Chen, Busel

Abstention: (1) Heald

Explanation of Vote:

Burley - I object to the 60 foot exclusion for the following reasons:

- The 60 ft exclusion allows for a zero psf extreme wind load (Rule 250C) for structures less than 60 ft tall. This is not in the interest of public safety. It reduces the credibility of the NESC.
- Buildings are designed using the wind pressures of ASCE 7 (similar to Rule 250C), which are higher than NESC district wind pressures. Poles may fail and impact the buildings that they provided power to. This is not in the interest of public safety.
- Some transmission line structures and many substation take-off (line termination) structures (230-kV and lower) are less than 60 feet tall. They should not be included in the 60 foot inclusion. They should be designed for Rule 250C extreme wind loads.
- Not all distribution lines in the United States have trees around them that may create collateral damage.
- The NESC should be using the latest wind data (Rule 250 C) for all structure designs rather than the much older district load map. Perhaps distribution lines can be designed with a lower reliability, but they should not be totally excluded.

Busel - There are other codes, i.e. Canadian Standards that do not have such an exemption. There are transmission structures below 60'. Although wind creates debris that affects structures, there needs to be consideration of wind below 60'.

Chen - I voted negative on rejecting CP's 2766, 2673, and 2798 with the reason that I believe the extreme wind load should be considered in utility pole design even if it is below 60 ft. The reason of debris being the major cause of damage to utility poles could be considered by revising the CP as proposed by Kluge.

Clapp - see rationale in original CP

Heald - I believe the comments from the public were primarily addressing high wind on wood structures below 60 feet. I am concerned that SC 5 did not weigh the overwhelming number of comments to maintain the 60 foot exclusion against the increasing use of steel and concrete poles at the distribution level. I am concerned that we may not be adequately designing steel and concrete poles under 60 feet, especially in the medium loading district. I am also concerned that for Grade B construction, the 60 foot exclusion remains. Many distribution lines that are built to Grade C construction must meet Grade B construction at crossings and other situations. For wood construction, light, medium and heavy loading district loads will probably control design. However, for steel and concrete poles (Grade B), high wind may control design.

Jones -There is no logic in not considering wind loads just because a structure is less than 60 ft. An example is you

consider the load for a 70 foot pole (61 ft above ground) and you don't consider the load for a 65 ft pole (56.5 ft above ground)

Kluge - I concur with the Subcommittee's rejection because within both the heavy and light load districts, the District Loads adequately provide the necessary strength for wind. However, since there appears to be a deficiency in the Medium Load District, I wish we could have reached a compromise that would have addressed that issue. This deficiency should not have to wait for another revision cycle.

Peters - The extreme wind load was introduced in the 1977 NESC to accommodate the wind loads on large diameter conductors, which were not adequately covered by the ice and wind combination for medium and heavy district. Structures under 60 feet were excluded at the time. This was done because distribution and communication wire diameters generally did not exceed the diameters that would cause excessive loading over the loads provided in the medium and heavy loading areas. The loads applied to the structure due to wind are determined by engineering calculations based on wind pressures on iced wires and wind pressure on bare wire. If we do these basis calculations on wires of varied diameters, we find that loads winds on bare conductors having large diameters (greater than one inch) exceed the design loads on ice loaded wires (with overload factors). As the wire diameters increase the wind requires the exceed the design loads decreases. It has been shown that wind velocities in the range of 60 mph will exceed the design loads in the medium loaded districts.

There is ample evidence that a 60 mph design load is not adequate to provide for the public safety. This wind speed is much lower then the required wind loading for any code standards that I am aware of in the US.

Rempe - See comments from Peters and Heald

New Text

Part: 2 Section: 25 Rule: 250 **CP2802**

Also Part:2 Section:25 251 SC5

Part:2 Section:25 253 SC5

Part:2 Section:26 260 SC5

Part:2 Section:26 261 SC5

Part:2 Section:27 277 SC5

Part:2 Section:27 278 SC5

CM4028 Thomas Pritchard

Part:2 Section:25 250

CM4043 Bruce Freimark American Electric Power

Part:2 Section:25 250

CM4097 Phil Morse

Part:2 Section:25 253

CM4210 Jim Kinghorn Cape Hatteras Electric Cooperative

Part:2 Section:25 250

CM4248 Roger Kuhlman Salem Electric Cooperative

Part:2 Section:25 250

CM4463 James T Collins Southeastern Electric Exchange

Part:2 Section:25 250

CM4491 EDWARD THOMAS Utility Electrical Consultants, PC

Part:2 Section:25 250

CM4499 A.C. Channaiah AEP

Part:2 Section:25 250

CM4500 A.C. Channaiah AEP

Part:2 Section:25 250

CM4519 Ronnie Gunnell Randolph Electric Membership Corp

Part:2 Section:25 250

CM4563 Jimmy Lanier Randolph Electric Membership Corporation

Part:2 Section:25 250

CM4671 Dennis Mabe

Part:2 Section:25 250

CM4821 McCachern Steven

Part:2 Section:25 250

CM4926 Kenneth Miller Bangor Hydro-Electric

Entire CP

CM4928 Jay Albright Randolph Electric

Part:2 Section:25 250

CM4940 Robert Harris Four County Electric Membership Corp

Part:2 Section:25 250

CM4942 Steve West Portland General Electric

Part:2 Section:25 250

CM4984 Dana Hale Maine Public Service

Part:2 Section:25 250

Subcommittee Recommendation: Accept as Modified in 2005

Subcommittee Comment:

Accept the modification of CM4500

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Standford, Vivas, Wong

Negative: (1) Soderberg, Jr.

Abstention: (0)

Explanation of Vote:

Clapp - I agree with Kempner's explanation of vote

Kempner – I voted to accept this CP, but want to record my objection to having a 60 ft exclusion. The rule should also be applied to structure with heights lower than 60 ft, distribution structures.

Soderberg - This proposal adds complexity for example with different ice loads for Grade B and C construction, and an additional ice and wind loading map. This position reflects many of the comments received.

Wong – In principle, I do not agree with providing a simplified wind pressure table without equations or methods. I think a national standard should provide enough information and let each user to choose their own way of simplification. However, the concurrent wind values indicate in the map are approximate values to start with (maximum wind speed recorded with 7 day after the ice storm). Thus, I voted in agreement with the modification.

Revised Text

Part: 2 Section: 25 Rule: 250 A-C, Fig 250-1, ... **CP2736**

Also Part:2 Section:25 251 B3, Table 251-1 SC5

Part:2 Section:25 252 B, C7 SC5

Part:2 Section:25 253 Table 253-1, 2 SC5

Part:2 Section:26 260 A, B SC5

Part:2 Section:26 261 A-M, Tbls 261-1A, 1B SC5

Part:2 Section:26 262 SC5

Part:2 Section:26 263 A-I, Tables 263-1, 2 SC5

Part:2 Section:26 264 A-G SC5

CM4777 Michael Hyland American Public Power Association

Part:2 Section:25 250 A-C, Fig 250-1, ...

CM4947 Steve West Portland General Electric

Part:2 Section:25 250 A-C, Fig 250-1, ...

Subcommittee Recommendation: Reject

Subcommittee Comment:

Same reasons as in the Preprint

Vote on Subcommittee Recommendation:

Affirmative: (22) Amato, Bullinger, Burley, Busel, Byrne, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Rempe, Schwalm, Shultz, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (1) Peters

Abstention: (2) Slavin, Chen

Explanation of Vote:

Chen - I voted abstentions on rejecting CP2736, CP2733, CP2734, and CP2568 with the same reason that I believe the Reliability Based Design should be the method to be used in determining strength factors (resistance factors).

Peters - See comments in Preprint

Slavin - See original Supporting Comment for this CP in Preprint

Revised Text

Part: 2 Section: 25 Rule: 250 A1 **CP2766**

Also Part:2 Section:25 250 C SC5

Part:2 Section:25 250 C2 SC5

Part:2 Section:25 250 TABLE 250-2 SC5

Part:2 Section:25 253 Tables 253-1 & 253-2 SC5

Part:2 Section:26 261 A1c SC5

Part:2 Section:25 261 A2f SC5

CM4007 Lawrence Slavin Alliance for Telecommunications Industry Solutions

Entire CP

CM4018 Jane Cooke Santee Cooper

Entire CP

CM4030 Scott Wehler

Entire CP

CM4031 Dave Asgharian Utility Engineer

Part:2 Section:25 253 Tables 253-1 & 253-2

CM4051 Albert Zogopoulos Unitil Service Corp.

Entire CP

CM4061 Paul Krell Unitil

Entire CP

CM4071 Jacob Dusling Unitil

Entire CP
CM4081 Scott harding Unitil
Entire CP
CM4092 Mike Busby Unitil
Entire CP
CM4096 Phil Morse
Entire CP
CM4110 John Bonazoli Unitil
Entire CP
CM4120 Scott Shepard Unitil
Entire CP
CM4131 Scott Shepard SS Utility Solutions, PLLC
Entire CP
CM4140 Justin Eisfelleer Unitil Service Corp.
Entire CP
CM4152 Kevin Sprague Unitil Service Corp.
Entire CP
CM4160 Scott Shepard SS Utility Solutions, PLLC
Entire CP
CM4164 Jim Kinghorn Cape Hatteras Electric Cooperative
Entire CP
CM4171 James Goudreault Unitil
Entire CP
CM4181 Albert Zogopoulos Self
Entire CP
CM4188 nathan sherwood Unitil
Entire CP
CM4208 Timothy Croushore Allegheny Power
Part:2 Section:25 250 A1
CM4237 Robert Kluge Wisconsin Utilities Association
Part:2 Section:25 250 A1
CM4242 Thomas Pritchard Jones-Onslow EMC
Part:2 Section:25 250 A1
CM4249 Roger Kuhlman Salem Electric Cooperative
Part:2 Section:25 250 C
CM4263 Ron Corzine Savannah Electric
Entire CP
CM4290 Gregory Obenchain Edison Electric Institute
Entire CP
CM4409 Barney Drake
Entire CP
CM4322 Tom Meissner Unitil
Entire CP
CM4328 Harold Murphy Wake Electric (Rural Electric Cooperative)
Entire CP
CM4342 J. Reed Cooper
Entire CP
CM4374 Charles Faulds Texas Electric Cooperatives
Entire CP
CM4392 Robert Higbe Santee Electric Cooperative, inc
Part:2 Section:25 250 A1
CM4457 James T Collins Southeastern Electric Exchange
Part:2 Section:25 250 C
CM4489 EDWARD THOMAS Utility Electrical Consultants, PC

- Entire CP
CM4511 Rob Ardis Pee Dee Electric Cooperative, Inc.
Part:2 Section:25 250 A1
- CM4522 Thomas Haire** Rutherford EMC
Entire CP
- CM4542 Robert Wilbur** Mid-Carolina Electric Cooperative, Inc.
Entire CP
- CM4543 Ronnie Gunnell** Randolph Electric Membership Corp.
Part:2 Section:25 250 A1
- CM4561 David West** Duke Energy
Entire CP
- CM4568 Charles A. Blackmon** Blue Ridge Electric Cooperative, Inc.
Part:2 Section:25 250 A1
- CM4580 David Sofra**
Entire CP
- CM4608 A. Berl Davis, Jr.**
Part:2 Section:25 250 A1
- CM4622 Jason Merchant** ECSC Engineering Association
Part:2 Section:25 250 A1
- CM4629 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 250 TABLE 250-2
- CM4630 Gonzalez Gabriel** BellSouth Telecommunications
Entire CP
- CM4632 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 250 A1
- CM4633 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 250 C
- CM4634 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4635 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4636 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4637 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:26 261 A1c
- CM4638 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 261 A2f
- CM4664 Monroe Phil** Lynches River Electric Cooperative
Part:2 Section:25 250 A1
- CM4703 thomas black** fairfield electric cooperative
Part:2 Section:25 250 A1
- CM4731 Tommy King** Jackson EMC
Part:2 Section:25 250 A1
- CM4754 Michael Hyland** American Public Power Association
Entire CP
- CM4757 Christopher Fettes**
Entire CP
- CM4790 Robert Ott** Tri-county Electric Cooperative
Part:2 Section:25 250 A1
- CM4815 McCachern Steven**
Entire CP
- CM4829 Terry Williams** ECSC Inc
Part:2 Section:25 250 A1
- CM4833 Ryan Smoak** McCall-Thomas Engineering

- Entire CP
- CM4843 Jacob Joplin** Carteret Craven EMC
Part:2 Section:25 250 A1
- CM4854 Tom Myers**
Part:2 Section:25 250 A1
- CM4860 Joe Costello**
Part:2 Section:25 250 A1
- CM4871 Tim Mobley**
Part:2 Section:25 250 A1
- CM4879 Shaw Lewis** Brunswick EMC
Part:2 Section:25 250 A1
- CM4880 Richard Hensel** IEEE
Part:2 Section:25 250 A1
- CM4888 Karl Keeton** VVEC
Part:2 Section:25 250 A1
- CM4897 Terry Williams** ECSC INC
Part:2 Section:25 250 A1
- CM4903 Benjamin Beagle** Cape Hatteras Electric Cooperative
Part:2 Section:25 250 A1
- CM4912 Jerry McMullan** Florida Power & Light Company
Entire CP
- CM4917 Kenneth Miller** Bangor Hydro-Electric
Entire CP
- CM4936 Bradley Schmidt** Cass County Electric Cooperative, Inc.
Entire CP
- CM4941 Robert Harris** Four County Electric Membership Corp.
Part:2 Section:25 250 A1
- CM4955 Anthony Barrow** Pitt and Greene Electric Membership Corporation
Part:2 Section:25 250 A1
- CM4980 Dana Hale** Maine Public Service Company
Entire CP
- CM4992 Michael Wood** South River Electric Membership Corporation
Entire CP
- CM4997 Donald Kellar**
Entire CP
- CM5000 Rex Bullinger** National Cable & Telecommunications Association
Entire CP

Subcommittee Recommendation: Reject

Subcommittee Comment:

CP's 2766, 2673, and 2798 are rejected based on information obtained from public comments. Utility experience has demonstrated that electrical distribution and communication line structures, under 60 ft in height, are damaged during extreme wind events by trees, tree limbs, and other flying debris. Designing structures with heights less than 60 ft for extreme winds will increase pole strengths for distribution systems resulting in large increases in cost and design complexity without commensurate increase in safety. Safety of employees and the public is provided using the current NESC loading requirements.

Vote on Subcommittee Recommendation:

Affirmative: (17) Amato, Bullinger, Byrne, Clem, Denbrock, Freimark, Harrel, Kempner, Kinghorn, Kluge, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (7) Clapp, Jones, Peters, Burley, Rempe, Chen, Busel

Abstention: (1) Heald

Explanation of Vote:

Burley - I object to the 60 foot exclusion for the following reasons:

- The 60 ft exclusion allows for a zero psf extreme wind load (Rule 250C) for structures less than 60 ft tall. This is not in the interest of public safety. It reduces the credibility of the NESC.
- Buildings are designed using the wind pressures of ASCE 7 (similar to Rule 250C), which are higher than NESC district wind pressures. Poles may fail and impact the buildings that they provided power to. This is not in the interest of public safety.
- Some transmission line structures and many substation take-off (line termination) structures (230-kV and lower) are less than 60 feet tall. They should not be included in the 60 foot inclusion. They should be designed for Rule 250C extreme wind loads.
- Not all distribution lines in the United States have trees around them that may create collateral damage.
- The NESC should be using the latest wind data (Rule 250 C) for all structure designs rather than the much older district load map. Perhaps distribution lines can be designed with a lower reliability, but they should not be totally excluded.

Busel - There are other codes, i.e. Canadian Standards that do not have such an exemption. There are transmission structures below 60'. Although wind creates debris that affects structures, there needs to be consideration of wind below 60'.

Chen - I voted negative on rejecting CP's 2766, 2673, and 2798 with the reason that I believe the extreme wind load should be considered in utility pole design even if it is below 60 ft. The reason of debris being the major cause of damage to utility poles could be considered by revising the CP as proposed by Kluge.

Clapp - I agree with Burley, Busel, Jones, Peters and Heald

Jones - There is no logic in not considering wind loads just because a structure is less than 60 ft. An example is you consider the load for a 70 foot pole (61 ft above ground) and you don't consider the load for a 65 ft pole (56.5 ft above ground)

Kluge - I concur with the Subcommittee's rejection because within both the heavy and light load districts, the District Loads adequately provide the necessary strength for wind. However, since there appears to be a deficiency in the Medium Load District, I wish we could have reached a compromise that would have addressed that issue. This deficiency should not have to wait for another revision cycle.

Peters - The extreme wind load was introduced in the 1977 NESC to accommodate the wind loads on large diameter conductors, which were not adequately covered by the ice and wind combination for medium and heavy district. Structures under 60 feet were excluded at the time. This was done because distribution and communication wire diameters generally did not exceed the diameters that would cause excessive loading over the loads provided in the medium and heavy loading areas. The loads applied to the structure due to wind are determined by engineering calculations based on wind pressures on iced wires and wind pressure on bare wire. If we do these basis calculations on wires of varied diameters, we find that loads winds on bare conductors having large diameters (greater than one inch) exceed the design loads on ice loaded wires (with overload factors). As the wire diameters increase the wind requires the exceed the design loads decreases. It has been shown that wind velocities in the range of 60 mph will exceed the design loads in the medium loaded districts.

There is ample evidence that a 60 mph design load is not adequate to provide for the public safety. This wind speed is much lower than the required wind loading for any code standards that I am aware of in the US.

Heald- I believe the comments from the public were primarily addressing high wind on wood structures below 60 feet. I am concerned that SC 5 did not weigh the overwhelming number of comments to maintain the 60 foot exclusion against the increasing use of steel and concrete poles at the distribution level. I am concerned that we may not be adequately designing steel and concrete poles under 60 feet, especially in the medium loading district. I am also concerned that for Grade B construction, the 60 foot exclusion remains. Many distribution lines that are built to Grade C construction must meet Grade B construction at crossings and other situations. For wood construction, light, medium and heavy loading district loads will probably control design. However, for steel and concrete poles (Grade B), high wind may control design.

Rempe - Refer to comments by Heald

Deleted Text

Part: 2 Section: 25 Rule: 250 A1 **CP2798**

Also Part:2 Section:25 250 C SC5

Part:2 Section:25 250 C2 SC5

Part:2 Section:25 253 Tables 253-1 & 253-2 SC5

Part:2 Section:26 261 A1c SC5

Part:2 Section:26 261 A2f SC5

CM4011 J. Michael Barringer Southern Maryland Electric Cooperative, Inc.

Entire CP

CM4038 Dave Asgharian Utility Engineer

Entire CP

CM4054 Albert Zogopoulos Unitil Service Corp.

Entire CP

CM4064 Paul Krell Unitil

Entire CP

CM4074 Jacob Dusling Unitil

Entire CP

CM4084 Scott harding Unitil

Entire CP

CM4095 Mike Busby Unitil

Entire CP

CM4112 John Bonazoli Unitil

Entire CP

CM4123 Scott Shepard Unitil

Entire CP

CM4135 Scott Shepard SS Utility Solutions, PLLC

Entire CP

CM4143 Justin Eisfelleer Unitil Service Corp.

Entire CP

CM4158 Kevin Sprague Unitil Service Corp.

Entire CP

CM4163 Scott Shepard SS Utility Solutions, PLLC

Entire CP

CM4174 James Goudreault Unitil

Entire CP

- CM4184 Albert Zogopoulos** Self
Entire CP
- CM4189 nathan sherwood** Unitil
Entire CP
- CM4209 Timothy Croushore** Allegheny Power
Part:2 Section:25 250 A1
- CM4243 Thomas Pritchard** Jones-Onslow EMC
Part:2 Section:25 250 A1
- CM4410 Barney Drake**
Entire CP
- CM4325 Tom Meissner** Unitil
Entire CP
- CM4340 J. Reed Cooper**
Part:2 Section:25 250 A1
- CM4371 Charles Faulds** Texas Electric Cooperatives
Entire CP
- CM4385 Robert Higbe** Santee Electric Cooperative, Inc.
Entire CP
- CM4386 Robert Higbe** Santee Electric Cooperative, Inc.
Part:2 Section:25 250 A1
- CM4501 A.C. Channaiah** AEP
Entire CP
- CM4512 Rob Ardis** Pee Dee Electric Cooperative, Inc.
Part:2 Section:25 250 A1
- CM4525 Thomas Haire** Rutherford EMC
Entire CP
- CM4544 Robert Wilbur** Mid-Carolina Electric Cooperative, Inc.
Entire CP
- CM4569 Charles A. Blackmon** Blue Ridge Electric Cooperative
Part:2 Section:25 250 A1
- CM4581 David Sofra**
Entire CP
- CM4611 A. Berl Davis, Jr.**
Part:2 Section:25 250 A1
- CM4623 Jason Merchant** ECSC Engineering Association
Part:2 Section:25 250 A1
- CM4640 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 250 A1
- CM4641 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 250 C2
- CM4642 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 250 C
- CM4643 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4644 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:26 261 A1c
- CM4645 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:26 261 A2f
- CM4665 Monroe Phil** Lynches River Electric Cooperative
Part:2 Section:25 250 A1
- CM4672 Dennis Mabe**
Part:2 Section:25 250 A1
- CM4704 thomas black** fairfield electric cooperative
Part:2 Section:25 250 A1

- CM4729 Tommy King** Jackson EMC
Part:2 Section:25 250 A1
- CM4750 Pete Montes** Farmers Electric Cooperative, Inc.
Entire CP
- CM4758 Michael Hyland** American Public Power Association
Entire CP
- CM4793 Robert Ott** Tri-county Electric Cooperative
Part:2 Section:25 250 A1
- CM4820 McCachern Steven**
Entire CP
- CM4834 Ryan Smoak** McCall-Thomas Engineering
Entire CP
- CM4844 Jacob Joplin** Carteret Craven EMC
Entire CP
- CM4855 Tom Myers**
Part:2 Section:25 250 A1
- CM4859 Terry Williams** ECSC
Part:2 Section:25 250 A1
- CM4861 Joe Costello**
Part:2 Section:25 250 A1
- CM4878 Robert Harris**
Part:2 Section:25 250 A1
- CM4884 Tim Mobley**
Part:2 Section:25 250 A1
- CM4914 Jerry McMullan** Florida Power & Light Company
Entire CP
- CM4924 Kenneth Miller** Bangor Hydro-Electric
Entire CP
- CM4965 Charles Faulds** HILCO Electric Cooperative
Entire CP
- CM4982 Dana Hale** Maine Public Service Company
Entire CP

Subcommittee Recommendation: Reject

Subcommittee Comment:

CP's 2766, 2673, and 2798 are rejected based on information obtained from public comments. Utility experience has demonstrated that electrical distribution and communication line structures, under 60 ft in height, are damaged during extreme wind events by trees, tree limbs, and other flying debris. Designing structures with heights less than 60 ft for extreme winds will increase pole strengths for distribution systems resulting in large increases in cost and design complexity without commensurate increase in safety. Safety of employees and the public is provided using the current NESC loading requirements.

Vote on Subcommittee Recommendation:

Affirmative: (17) Amato, Bullinger, Byrne, Clem, Denbrock, Freimark, Harrel, Kempner, Kinghorn, Kluge, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (7) Clapp, Jones, Peters, Burley, Rempe, Chen, Busel

Abstention: (1) Heald

Explanation of Vote:

Burley - I object to the 60 foot exclusion for the following reasons:

- The 60 ft exclusion allows for a zero psf extreme wind load (Rule 250C) for structures less than 60 ft tall. This is not in the interest of public safety. It reduces the credibility of the NESC.
- Buildings are designed using the wind pressures of ASCE 7 (similar to Rule 250C), which are higher than NESC district wind pressures. Poles may fail and impact the buildings that they provided power to. This is not in the interest of public safety.
- Some transmission line structures and many substation take-off (line termination) structures (230-kV and lower) are less than 60 feet tall. They should not be included in the 60 foot inclusion. They should be designed for Rule 250C extreme wind loads.
- Not all distribution lines in the United States have trees around them that may create collateral damage.
- The NESC should be using the latest wind data (Rule 250 C) for all structure designs rather than the much older district load map. Perhaps distribution lines can be designed with a lower reliability, but they should not be totally excluded.

Busel - There are other codes, i.e. Canadian Standards that do not have such an exemption. There are transmission structures below 60'. Although wind creates debris that affects structures, there needs to be consideration of wind below 60'.

Chen - I voted negative on rejecting CP's 2766, 2673, and 2798 with the reason that I believe the extreme wind load should be considered in utility pole design even if it is below 60 ft. The reason of debris being the major cause of damage to utility poles could be considered by revising the CP as proposed by Kluge.

Clapp - I agree with Burley, Busel, Jones, Peters and Heald

Jones -There is no logic in not considering wind loads just because a structure is less than 60 ft. An example is you consider the load for a 70 foot pole (61 ft above ground) and you don't consider the load for a 65 ft pole (56.5 ft above ground)

Kluge - I concur with the Subcommittee's rejection because within both the heavy and light load districts, the District Loads adequately provide the necessary strength for wind. However, since there appears to be a deficiency in the Medium Load District, I wish we could have reached a compromise that would have addressed that issue. This deficiency should not have to wait for another revision cycle.

Peters - The extreme wind load was introduced in the 1977 NESC to accommodate the wind loads on large diameter conductors, which were not adequately covered by the ice and wind combination for medium and heavy district. Structures under 60 feet were excluded at the time. This was done because distribution and communication wire diameters generally did not exceed the diameters that would cause excessive loading over the loads provided in the medium and heavy loading areas. The loads applied to the structure due to wind are determined by engineering calculations based on wind pressures on iced wires and wind pressure on bare wire. If we do these basis calculations on wires of varied diameters, we find that loads winds on bare conductors having large diameters (greater than one inch) exceed the design loads on ice loaded wires (with overload factors). As the wire diameters increase the wind requires the exceed the design loads decreases. It has been shown that wind velocities in the range of 60 mph will exceed the design loads in the medium loaded districts.

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Heald - I believe the comments from the public were primarily addressing high wind on wood structures below 60

feet. I am concerned that SC 5 did not weigh the overwhelming number of comments to maintain the 60 foot exclusion against the increasing use of steel and concrete poles at the distribution level. I am concerned that we may not be adequately designing steel and concrete poles under 60 feet, especially in the medium loading district. I am also concerned that for Grade B construction, the 60 foot exclusion remains. Many distribution lines that are built to Grade C construction must meet Grade B construction at crossings and other situations. For wood construction, light, medium and heavy loading district loads will probably control design. However, for steel and concrete poles (Grade B), high wind may control design.

Rempe - My negative vote reflects a desire to move the code toward acknowledging the work of the Task Force and that winds below 60 ft should be accounted for. As historical documentation reflects the exception was based on loading conditions for distribution structures that are significantly less than are regularly designed for today. Today's loads include larger electrical conductors and devices along with the plethora of communications attachments of varying shapes, sizes, weights, and tensions. This comment is not meant to discount the predominate failure modes of trees and debris from excessive wind events.

Revised Text

Part: 2 Section: 25 Rule: 250 A2 **CP2658**

Also Part:2 Section:25 253 Table 253-1 SC5

Part:2 Section:26 263 A SC5

Part:2 Section:26 263 C SC5

CM4021 Jane Cooke Santee Cooper

Part:2 Section:25 250 A2

CM4227 Robert Kluge Wisconsin Utilities Association

Part:2 Section:25 250 A2

CM4244 Thomas Pritchard Jones-Onslow EMC

Part:2 Section:25 250 A2

CM4269 Ron Corzine Savannah Electric

Part:2 Section:25 250 A2

CM4291 Gregory Obenchain Edison Electric Institute

Part:2 Section:25 250 A2

CM4358 J. Reed Cooper

Part:2 Section:25 250 A2

CM4390 Robert Higbe Santee Electric Cooperative, Inc.

Part:2 Section:25 250 A2

CM4406 Barney Drake

Part:2 Section:25 250 A2

CM4452 James T Collins Southeastern Electric Exchange

Part:2 Section:25 250 A2

CM4507 Rob Ardis Pee Dee Electric Cooperative, Inc.

Part:2 Section:25 250 A2

CM4538 Robert Wilbur Mid-Carolina Electric Cooperative, Inc.

Part:2 Section:25 250 A2

CM4547 Ronnie Gunnell Randolph Electric Membership Corp.

Part:2 Section:25 250 A2

CM4552 David West Duke Energy

Part:2 Section:25 250 A2

CM4564 Charles A. Blackmon Blue Ridge Electric Cooperative, Inc.

Part:2 Section:25 250 A2

CM4582 David Sofra

Part:2 Section:25 250 A2

CM4592 A. Berl Davis, Jr.

- Part:2 Section:25 250 A2
CM4600 Jimmy Lanier Randolph EMC
Part:2 Section:25 250 A2
CM4609 Jason Merchant ECSC Engineering Association
Part:2 Section:25 250 A2
CM4661 Monroe Phil Lynches River Electric Cooperative
Part:2 Section:25 250 A2
CM4675 Dennis Mabe
Part:2 Section:25 250 A2
CM4689 thomas black fairfield electric cooperative
Part:2 Section:25 250 A2
CM4722 Tommy King Jackson EMC
Part:2 Section:25 250 A2
CM4735 Michael Hyland American Public Power Association
Part:2 Section:25 250 A2
CM4736 Michael Hyland American Public Power Association
Part:2 Section:25 250 A2
CM4781 Robert Ott Tri-county Electric Cooperative
Part:2 Section:25 250 A2
CM4802 Joe Costello
Part:2 Section:25 250 A2
CM4810 McCachern Steven
Part:2 Section:25 250 A2
CM4850 Tom Myers
Entire CP
CM4867 Tim Mobley
Entire CP
CM4889 Terry Williams ECSC INC
Part:2 Section:25 250 A2
CM4891 Patrick Clark
Part:2 Section:25 250 A2
CM4919 Jerry McMullan Florida Power & Light Company
Part:2 Section:25 250 A2
CM4950 A.C. Channaiah AEP
Part:2 Section:25 250 A2
CM4969 Mickey Gunter Georgia Power Company
Part:2 Section:25 250 A2
CM4996 Donald Kellar
Part:2 Section:25 250 A2

Subcommittee Recommendation: Accept as Modified in 2005

Subcommittee Comment:

Substitute in words from CM4227

Vote on Subcommittee Recommendation:

Affirmative: (19) Amato, Busel, Byrne, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Shultz, Slavin, Standford, Vivas, Wong

Negative: (2) Burley, Soderberg, Jr.

Abstention: (2) Bullinger, Chen

Explanation of Vote:

Bullinger – Lack of expertise

Burley - Workers have been killed during construction and maintenance operations. This committee should be able to define minimum safety loads for construction and maintenance operations.

Chen - I voted abstention on CP2658 with revision by CM4227. The reason for my abstention is that if the intent of the new proposed language given in CM4227 is the same as in the original language given in CP2658, as was discussed at the meeting, I felt that what was proposed in CP2658 is more specific to follow. I therefore, voted abstention.

Soderberg - , I do not feel the revised text clarifies what already exists in the Code, nor does it add safety. The proposal ads wording which is not required.

New Text

Part: 2 Section: 25 Rule: 250 A5 **CP2733**

Also Part:2 Section:26 260 B1 SC5

CM4702 Michael Hyland American Public Power Association
Part:2 Section:25 250 A5

CM4782 Michael Hyland American Public Power Association
Part:2 Section:25 250 A5

Subcommittee Recommendation: Reject

Subcommittee Comment:

Same reasons as in the Preprint

Vote on Subcommittee Recommendation:

Affirmative: (23) Amato, Bullinger, Burley, Busel, Byrne, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (2) Slavin, Chen

Explanation of Vote:

Chen - I voted abstentions on rejecting CP2736, CP2733, CP2734, and CP2568 with the same reason that I believe the Reliability Based Design should be the method to be used in determining strength factors (resistance factors).

Slavin – See original Supporting Comment in Preprint

New Text

Part: 2 Section: 25 Rule: 250 A5 **CP2734**

Also Part:2 Section:25 254 A-F, Tables 254-1,2 SC5

Part:2 Section:26 260 A3, B2 SC5

Part:2 Section:26 262 A, B, Tables 262-1,2 SC5

CM4780 Michael Hyland American Public Power Association

Part:2 Section:25 250 A5

CM4944 Steve West Portland General Electric

Part:2 Section:25 250 A5

Subcommittee Recommendation: Reject

Subcommittee Comment:

Same reasons as in the Preprint

Vote on Subcommittee Recommendation:

Affirmative: (22) Amato, Bullinger, Burley, Busel, Byrne, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Rempe, Schwalm, Shultz, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (1) Peters

Abstention: (2) Slavin, Chen

Explanation of Vote:

Chen - I voted abstentions on rejecting CP2736, CP2733, CP2734, and CP2568 with the same reason that I believe the Reliability Based Design should be the method to be used in determining strength factors (resistance factors).

Peters - See comments in Preprint

Slavin – See original Supporting Comment in Preprint

Revised Text

Part: 2 Section: 25 Rule: 250 C **CP2532**

Subcommittee Recommendation: Accept as Modified in Preprint/2003

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

New Text

Part: 2 Section: 25 Rule: 250 C **CP2718**

Also Part:2 Section:25 250 Table 250-2 **SC5**

Part:2 Section:25 250 Table 250-2 **SC5**

Part:2 Section:25 250 Table 253-3 **SC5**

CM4002 Alain Peyrot IEEE

Entire CP

CM4497 Jon Peterka

Entire CP

Subcommittee Recommendation: Reject

Subcommittee Comment:

For reasons stated in the Preprint

Vote on Subcommittee Recommendation:

Affirmative: (19) Amato, Burley, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Jones, Kempner, Kinghorn, Peters, Schwalm, Shultz, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (4) Heald, Kluge, Slavin, Rempe

Abstention: (2) Bullinger, Busel

Explanation of Vote:

Bullinger - I feel it is too early to set up new task forces for 2012 edition. That is so far out that this is likely to be forgotten.

Busel – I do not have sufficient knowledge nor have an opinion on this subject.

Kluge, Heald, Rempe, Slavin, See Preprint comments

New Text

Part: 2 Section: 25 Rule: 250 C **CP2783**

Also Section:3 Reference SC1

Part:2 Section:25 250 Figure 250-2a SC5

Part:2 Section:25 250 Figure 250-2b SC5

Part:2 Section:25 250 Figure 250-2c SC5

Part:2 Section:25 250 Figurev 250-2e SC5

Part:2 Section:25 250 Table 250-2 SC5

Part:2 Section:25 250 Table 250-3 ft SC5

Part:2 Section:25 250 Table 250-3 m SC5

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (1) Kinghorn

Abstention: (0)

Explanation of Vote:

Kinghorn - The NESC Committee should seriously consider the discontinuation of citing the work of other code entities as a part of the NESC. First, we are using work products that may be changed or abandoned by their respective bodies. Second, the practice requires that persons using the NESC be familiar with the referenced code (the complexity factor). And finally, it assumes that the cited code is applicable to utility line design, which has only been investigated by a few individuals. The NESC (or any code) should be constructed in a way so that it

stands on its own and does not require cross referencing, and in some cases double cross referencing, to other documents.

Revised Text

Part: 2 Section: 25 Rule: 250 C **CP2785**

Also Part:2 Section:25 250 C SC5

Part:2 Section:25 251 A2 SC5

Part:2 Section:25 252 B2b SC5

Part:2 Section:25 252 B2c SC5

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (1) Kluge

Abstention: (0)

Explanation of Vote:

Kluge - See Preprint

Revised Text

Part: 2 Section: 25 Rule: 250 C **CP2787**

Also Part:2 Section:25 250 C1 SC5

Part:2 Section:25 250 C2 SC5

CM4462 James T Collins Southeastern Electric Exchange

Part:2 Section:25 250 C

CM4756 Michael Hyland American Public Power Association

Entire CP

Subcommittee Recommendation: Accept as Modified in 2005

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (1) Kluge

Abstention: (0)

Explanation of Vote:

Kluge - See Preprint

Revised TextPart: 2 Section: 25 Rule: 250 C **CP2828***Also Part:4 Section:44 441 A6a SC8***CM4763 Michael Hyland** American Public Power Association
Part:2 Section:25 250 C**Subcommittee Recommendation:** Accept**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

Revised TextPart: 2 Section: 25 Rule: 251 **CP2707***Also Part:2 Section:25 251 Table 251-1 SC5**Part:2 Section:26 261 H1 SC5***CM4219 Jim Kinghorn** Cape Hatteras Electric Cooperative
Part:2 Section:25 251**CM4245 Thomas Pritchard** Jones-Onslow EMC
Part:2 Section:25 251**CM4292 Gregory Obenchain** Edison Electric Institute
Entire CP**CM4738 Michael Hyland** American Public Power Association
Entire CP**Subcommittee Recommendation:** Reject**Subcommittee Comment:**

Reasons provided in CM4292

Vote on Subcommittee Recommendation:**Affirmative:** (21) Bullinger, Chen, Clapp, Denbrock, Freimark, Fuller, Harrel, Jones, Joplin, Kempner, Kinghorn, Kluge, Lonergan, Pehosh, Peters, Rempe, Slavin, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (3) Clem, Shultz, Burley**Abstention:** (1) Bingel**Explanation of Vote:**

Bingel - Not familiar enough with the issues.

Burley - Previous code revisions have led to misunderstanding and misapplication of the k factor. Its use doe not

follow statics. It has outlived its usefulness and should be removed from the code.

Clem - CP 2707 should be accepted. When the archive of the NESC are reviewed it is clear that the "k" factor was added in the early 1900's when the loading were changed to allow the template used for sag purposes to continue in use. This was only true for the small wire sizes in general use at the time and was primary due to the difficulty in making these templates by hand. The committee made it very clear that it was not intending to be part of the structure loading. The committee received 4 comments, 3 of which CM4219, CM4245, and CM 4738 support the CP, while CM4292 recommends rejecting because if accepted "numerous design program in common use would need to be revised." Voting to reject CP2707 on the basis of CM4292 in the modern day equivalent of adding the "k" to keep a hand drawn template in use. Code provision should have a sound engineering basis that is technically substantiated.

Shultz - The k-factor primarily affects the ice/wind loaded conductor tensions and sags. In most cases, where the initial unloaded limit or the final unloaded limit governs, the sag and tension values for the unloaded conditions are unaffected by the factor. Analyses of the sag and tension results for a wide selection of conductors show that removal of the factor would result in slightly lower loaded tensions and slightly less sags for the ice/wind loading cases with other sag and tension values unaffected for most situations. Removal of the factor would result in a more precise representation of the actual conductor/wire behaviors with little impact on conductor loadings.

Revised Text

Part: 2 Section: 25 Rule: 251 Table 251-1 **CP2613**

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

New Text

Part: 2 Section: 25 Rule: 252 A **CP2506**

CM4217 Steve West Portland General Electric
Part:2 Section:25 252 A

Subcommittee Recommendation: Reject

Subcommittee Comment:

Reason stated in the Preprint

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas,

Wong

Negative: (1) Clapp

Abstention: (0)

Explanation of Vote:

Clapp - see Preprint explanation

New Text

Part: 2 Section: 25 Rule: 252 B2b **CP2782**

Subcommittee Recommendation: Accept as modified in 2005

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 25 Rule: 252 B2c **CP2786**

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

New Text

Part: 2 Section: 25 Rule: 252 B3 **CP2507**

Subcommittee Recommendation: Withdrawn

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (0)

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 25 Rule: 253 **CP2717**

Also Part:2 Section:25 253 Table 253-2 **SC5**

Part:2 Section:26 261 A2 **SC5**

Part:2 Section:26 261 D2 **SC5**

Part:2 Section:26 261 Table 261-1B **SC5**

CM4012 J. Michael Barringer Southern Maryland Electric Cooperative, Inc.

Entire CP

CM4040 Dave Asgharian Utility Engineer

Entire CP

CM4048 Albert Zogopoulos Unitil Service Corp.

Entire CP

CM4058 Paul Krell Unitil

Entire CP

CM4068 Jacob Dusling Unitil

Entire CP

CM4078 Scott harding Unitil

Entire CP

CM4088 Mike Busby Unitil

Entire CP

CM4101 John Bonazoli Unitil

Entire CP

CM4117 Scott Shepard Unitil

Entire CP

CM4128 Scott Shepard SS Utility Solutions, PLLC

Entire CP

CM4137 Justin Eisfelleer Unitil Service Corp.

Entire CP

CM4148 Kevin Sprague Unitil Service Corp.

Entire CP

CM4155 Scott Shepard SS Utility Solutions, PLLC

Entire CP

CM4168 James Goudreault Unitil

Entire CP

CM4178 Albert Zogopoulos Self

Entire CP

CM4187 nathan sherwood Unitil

Entire CP

CM4319 Tom Meissner Unitil

Entire CP

CM4376 Charles Faulds Texas Electric Cooperatives

Entire CP

CM4381 Martin Rollins North American Wood Pole Council

Entire CP

CM4646 Gonzalez Gabriel BellSouth Telecommunications

Part:2 Section:25 253 Table 253-2

CM4647 Gonzalez Gabriel BellSouth Telecommunications

Part:2 Section:25 253

CM4648 Gonzalez Gabriel BellSouth Telecommunications

Part:2 Section:26 261 Table 261-1B

CM4649 Gonzalez Gabriel BellSouth Telecommunications

Entire CP

CM4650 Gonzalez Gabriel BellSouth Telecommunications

Part:2 Section:26 261 D2

CM4660 Gonzalez Gabriel BellSouth Telecommunications

Part:2 Section:26 261 A2

CM4674 Mickey Gunter Georgia Power Company (Retired)

Part:2 Section:25 253

CM4746 Rex Bullinger National Cable & Telecommunications Association

Entire CP

CM4749 Michael Hyland American Public Power Association

Entire CP

CM4769 Pete Montes Farmers Electric Cooperative, Inc.

Entire CP

CM4824 Steve West Portland General Electric

Entire CP

CM4913 Kenneth Miller Bangor Hydro-Electric

Entire CP

CM4987 Dana Hale Maine Public Service Company

Entire CP

Subcommittee Recommendation: Accept as modified in 2005

Subcommittee Comment:

Putting a sunset date of July 31, 2010 to ending the alternate method.

Vote on Subcommittee Recommendation:

Affirmative: (25) Bingel, Bullinger, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Heald, Jones, Joplin, Kempner, Kluge, Lonergan, Pehosh, Peters, Rempe, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised TextPart: 2 Section: 25 Rule: 253 **CP2829***Also Part:2 Section:27 277 SC5***CM4259 Ron Corzine** Savannah Electric

Part:2 Section:25 253

CM4363 Steve West Portland General Electric

Part:2 Section:25 253

CM4464 James T Collins Southeastern Electric Exchange

Part:2 Section:25 253

CM4680 Michael Hyland American Public Power Association

Part:2 Section:25 253

Subcommittee Recommendation: Accept in Part in 2005**Subcommittee Comment:**

Accepting the chart for the updating the references.

Vote on Subcommittee Recommendation:**Affirmative:** (24) Bingel, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Heald, Jones, Joplin, Kempner, Kinghorn, Kluge, Lonergan, Pehosh, Peters, Rempe, Shultz, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (0)**Abstention:** (2) Bullinger, Slavin**Explanation of Vote:**

Bullinger - Lack of expertise

Slavin - Insufficient expertise.

Revised TextPart: 2 Section: 25 Rule: 253 Table 253-1 **CP2505***Also Part:2 Section:26 260 B SC5**Part:2 Section:26 261 A SC5**Part:2 Section:26 261 C SC5**Part:2 Section:26 261 D SC5**Part:2 Section:26 261 Table 261-1A SC5***Subcommittee Recommendation:** Withdrawn**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (0)**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

Revised TextPart: 2 Section: 25 Rule: 253 Table 253-1 **CP2552****CM4448 James T Collins** Southeastern Electric Exchange

Part:2 Section:25 253 Table 253-1

Subcommittee Recommendation: Accept as Modified in 2005**Subcommittee Comment:**

With the correction from CM4448

Vote on Subcommittee Recommendation:**Affirmative:** (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

Revised TextPart: 2 Section: 25 Rule: 253 Table 253-1 **CP2568***Also Part:2 Section:26 261 Table 261-1A SC5***CM4214 Steve West** Portland General Electric

Part:2 Section:25 253 Table 253-1

CM4715 Michael Hyland American Public Power Association

Part:2 Section:25 253 Table 253-1

Subcommittee Recommendation: Reject**Subcommittee Comment:**

For reasons stated in the Preprint

Vote on Subcommittee Recommendation:**Affirmative:** (22) Amato, Bullinger, Burley, Busel, Byrne, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Peters, Rempe, Schwalm, Shultz, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (2) Kluge, Slavin**Abstention:** (1) Chen**Explanation of Vote:**

Chen - I voted abstentions on rejecting CP2736, CP2733, CP2734, and CP2568 with the same reason that I believe the Reliability Based Design should be the method to be used in determining strength factors (resistance factors).

Kluge – The ASCE RBD committee did calibrations of existing designs and determined that the 65% of the designated fiber stress is too punitive for wood pole design. I agree that a single strength factor has merit.

Through the years, the NESC has recognized more sophisticated design methods. We should provide incentives for designers to use there improved methods.

Slavin – See comment in Preprint

Revised Text

Part: 2 Section: 25 Rule: 253 Table 253-1 **CP2569**

Also Part:2 Section:26 260 B SC5

Part:2 Section:26 261 A3 SC5

Part:2 Section:26 261 C SC5

Part:2 Section:26 261 D SC5

Part:2 Section:26 261 Table 261-1A SC5

CM4293 Gregory Obenchain Edison Electric Institute

Part:2 Section:25 253 Table 253-1

CM4450 James T Collins Southeastern Electric Exchange

Part:2 Section:25 253 Table 253-1

CM4454 James T Collins Southeastern Electric Exchange

Part:2 Section:25 253 Table 253-1

CM4745 Michael Hyland American Public Power Association

Part:2 Section:25 253 Table 253-1

CM4918 Jerry McMullan Florida Power & Light Company

Part:2 Section:25 253 Table 253-1

Subcommittee Recommendation: Accept as Modified in 2005

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (15) Bingel, Clapp, Denbrock, Fuller, Heald, Kempner, Kinghorn, Lonergan, Pehosh, Peters, Rempe, Shultz, Slavin, Soderberg, Jr., Vivas

Negative: (8) Clem, Joplin, Harrel, Jones, Kluge, Standford, Wong, Burley

Abstention: (3) Freimark, Bullinger, Chen

Explanation of Vote:

Bullinger - Lack of expertise

Burley - Sufficient data has not been provided to use steel load factors for FRP poles. Steel poles have reserve strength above the yield strength before they collapse. The FRP poles are designed to the failure or collapse load similar to wood poles. I am also concerned about load duration effects of FRP poles close to the failure loads.

Chen - I voted abstention on this CP2569 because that several questions raised at the meeting were not been fully addressed

Clem – TVA has not made significant use of FRP structures or products on its transmission lines in the last 15 years. Consequently, we have no recent use or technical information to support or refute the inclusion of FRP with metal and prestressed material as proposed in CP2569. Our reliability and maintenance experience with fiberglass products installed in the 1970's has been poor. For new installations we have concerns with life expectancy, and degradation due to environmental conditions and exposures.

In addition, the proposal as written attempts to treat FRP as equivalent to steel structure; however, when using guys the proposal treats FRP more like a wood structure (261.C.3 new) instead of just modifying 261.C.1 to also mention FRP. Based on degradation issues, etc. the material should probably be treated uniquely and included with

provision in between that of steel and wood.

Harrel - Although I am not opposed to adding new materials to the code as they become available and proven, I do not feel that the FRP products have proven themselves adequate to be considered to use steel safety factors. Since, to my knowledge, there is not a standard presently established for FRP products, I do not believe it is within the scope of prudent engineering judgment to include these products utilizing the proposed safety factors at this time.

Jones - The data does not support the factors shown in the tables. FRP is not wood and is not steel; the tables use wood factors for guyed structures steel factors for unguyed structures.

Kluge – I support the addition of fiberglass composites into the NESC 2007u, however, this proposal considers the FRC material like steel for the strength properties and provides the option to consider the material as a strut only when used in a guyed application.

In other words, in one rule the proposal considers FRC like steel while in the other rule it considers its properties more like wood. Since FRC poles are typically tubular in shape, their moment of inertia is more like steel than that of wood pole that have solid cross-section.

Standford - I don't feel that the manufacturer's have submitted enough documented, technical data specific to utility structures to allow FRP structures to use steel safety factors. Hopefully research and testing on utility structures will be done in the near future.

Wong - Fiber-Reinforced Polymer Structures should be included in the Code. However, I am not sure that it can be treated the same as “metal or prestressed concrete” pole. Unlike those materials, fiber-reinforced polymer does not have a nationally recognized “standard” to outline the advantages and disadvantages that users need to be aware of. Some of the misuses, because of misunderstanding of a relatively new material, can generate safety hazard. Since NESC is not a design code, and it is not NESC’s responsibility to address issues such as material long-term behaviors, localized stress concentration, ... etc, it should assign a higher safety factor (at least until the fiber industry come up with a standard to address these issues).

Revised Text

Part: 2 Section: 25 Rule: 253 Table 253-1 **CP2807**

CM5049 Allen Clapp self

Part:2 Section:25 253 Table 253-1

Subcommittee Recommendation: Reject

Subcommittee Comment:

For Reason Stated in the Preprint

Vote on Subcommittee Recommendation:

Affirmative: (23) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (1) Clapp

Abstention: (1) Peters

Explanation of Vote:

Clapp - see Preprint and Comment 5049

Peters - Submitter should be here to address comments.

Revised Text

Part: 2 Section: 25 Rule: 253 Table 253-1 **CP2821**

CM4362 Steve West Portland General Electric

Part:2 Section:25 253 Table 253-1

CM4716 Michael Hyland American Public Power Association

Part:2 Section:25 253 Table 253-1

Subcommittee Recommendation: Reject

Subcommittee Comment:

Based on CM4362. Subcommittee Action Proposed for 2012 - 5.1.1 Task Force –Load Duration Effects (Kluge) – Bingel, Rollins, Shultz

Vote on Subcommittee Recommendation:

Affirmative: (23) Amato, Bullinger, Burley, Byrne, Chen, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (1) Clapp

Abstention: (1) Busel

Explanation of Vote:

Busel - I do not have sufficient knowledge nor have an opinion on this subject.

Clapp - see original rationale for adopting by subcommittee in Preprint

New Text

Part: 2 Section: 25 Rule: 253 Table 253-2 **CP2827**

Also Part:2 Section:26 261 Table 261-1A fn 2&3 **SC5**

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 25 Rule: 253 Table 253-2 fn3 **CP2822**

Also Part:2 Section:26 261 Table 261A SC5

Subcommittee Recommendation: Reject

Subcommittee Comment:

For reasons stated in the Preprint

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 25 Rule: 253 Tables 253-1 & 253-2 **CP2739**

Also Part:2 Section:26 261 F1a SC5

Part:2 Section:26 261 M SC5

CM4050 Albert Zogopoulos Unitil Service Corp.

Entire CP

CM4060 Paul Krell Unitil

Entire CP

CM4070 Jacob Dusling Unitil

Entire CP

CM4080 Scott harding Unitil

Entire CP

CM4091 Mike Busby Unitil

Entire CP

CM4103 John Bonazoli Unitil

Entire CP

CM4119 Scott Shepard Unitil

Entire CP

CM4130 Scott Shepard SS Utility Solutions, PLLC

Entire CP

CM4139 Justin Eisfelleer Unitil Service Corp.

Entire CP

CM4150 Kevin Sprague Unitil Service Corp.

Entire CP

CM4159 Scott Shepard SS Utility Solutions, PLLC

Entire CP

CM4170 James Goudreault Unitil

Entire CP

CM4180 Albert Zogopoulos Self

Entire CP

CM4194 nathan sherwood Unitil

Entire CP

CM4220 Jim Kinghorn Cape Hatteras Electric Cooperative

Part:2 Section:25 253 Tables 253-1 & 253-2

- CM4235 Robert Kluge** Wisconsin Utilities Association
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4264 Ron Corzine** Savannah Electric
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4318 Harold Murphy** Wake Electric (Rural Electric Cooperative)
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4321 Tom Meissner** Unitil
Entire CP
- CM4373 Charles Faulds** Texas Electric Cooperatives
Entire CP
- CM4520 Thomas Haire** Rutherford EMC
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4583 David Sofra**
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4617 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4620 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4621 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4626 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:26 261 F1a
- CM4627 Gonzalez Gabriel** BellSouth Telecommunications
Part:2 Section:26 261 M
- CM4814 McCachern Steven**
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4916 Kenneth Miller** Bangor Hydro-Electric
Entire CP
- CM4981 Dana Hale** Maine Public Service Company
Part:2 Section:25 253 Tables 253-1 & 253-2
- CM4983 Dana Hale** Maine Public Service Company
Part:2 Section:25 253 Tables 253-1 & 253-2

Subcommittee Recommendation: Accept

Subcommittee Comment:

CP2766 was rejected. The original CP submitted was accepted.

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 26 Rule: 260 A1 **CP2565**

CM4212 Steve West Portland General Electric

Part:2 Section:26 260 A1

Subcommittee Recommendation: Reject

Subcommittee Comment:

For reasons stated in the Preprint

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (1) Slavin

Explanation of Vote:

Slavin - See original Supporting Comment in Preprint

Revised Text

Part: 2 Section: 26 Rule: 260 A1 **CP2566**

CM4213 Steve West Portland General Electric

Part:2 Section:26 260 A1

Subcommittee Recommendation: Reject

Subcommittee Comment:

For reasons stated in Preprint

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (1) Slavin

Explanation of Vote:

Slavin - See original Supporting Comment in Preprint

Revised Text

Part: 2 Section: 26 Rule: 260 A2 **CP2612**

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel,

Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

New Text

Part: 2 Section: 26 Rule: 260 B **CP2567**

CM4045 Albert Zogopoulos Unitil Service Corp.

Part:2 Section:26 260 B

CM4055 Paul Krell Unitil

Part:2 Section:26 260 B

CM4065 Jacob Dusling Unitil

Part:2 Section:26 260 B

CM4075 Scott harding Unitil

Part:2 Section:26 260 B

CM4085 Mike Busby Unitil

Part:2 Section:26 260 B

CM4098 John Bonazoli Unitil

Part:2 Section:26 260 B

CM4114 Scott Shepard Unitil

Part:2 Section:26 260 B

CM4124 Scott Shepard SS Utility Solutions, PLLC

Part:2 Section:26 260 B

CM4127 Justin Eisfelleer Unitil Service Corp.

Part:2 Section:26 260 B

CM4144 Kevin Sprague Unitil Service Corp.

Part:2 Section:26 260 B

CM4146 Scott Shepard SS Utility Solutions, PLLC

Part:2 Section:26 260 B

CM4165 James Goudreault Unitil

Part:2 Section:26 260 B

CM4175 Albert Zogopoulos Self

Part:2 Section:26 260 B

CM4186 nathan sherwood Unitil

Part:2 Section:26 260 B

CM4197 Tom Meissner Unitil

Part:2 Section:26 260 B

CM4228 Robert Kluge Wisconsin Utilities Association

Part:2 Section:26 260 B

CM4449 James T Collins Southeastern Electric Exchange

Part:2 Section:26 260 B

CM4905 Kenneth Miller Bangor Hydro Electric

Part:2 Section:26 260 B

Subcommittee Recommendation: Reject

Subcommittee Comment:

Based on CM 4228

Vote on Subcommittee Recommendation:

Affirmative: (16) Amato, Bullinger, Byrne, Clapp, Clem, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Schwalm, Shultz, Soderberg, Jr., Stanford

Negative: (9) Denbrock, Peters, Vivas, Slavin, Wong, Burley, Rempe, Chen, Busel

Abstention: (0)

Explanation of Vote:

Burley - Explaining relative reliability based design is useful to design engineers. The reference should remain.

Busel - The RBD should be included in the code as it acknowledges the use of NESC in the text, pg.13. This reference provides readers with additional information.

Chen - voted negative on rejecting CP2567 for the reason that I believe the referenced ASCE document, Reliability-Based Design of Utility Pole Structures, is a useful document for providing a utility pole design with a desired target of reliability.

Denbrock - The reference should be included relating RBD Method because it is a valid procedure for engineers to understand the reliability level of the structures they design.

Peters and Slavin – The reference of ASCE RBD of utility pole structures is valid and should be included in this note.

Rempe - See Comments by Denbrock.

Vivas – "I voted negative on rejecting CP2567 for the reason that I believe the referenced ASCE document, Reliability-Based Design of Utility Pole Structures, is a useful and valid document for providing a utility pole design with a desired target of reliability. The reference should be included."

Wong – RBD method is a valid method for engineers to understand the reliability level of the structures they design. The reference should be included.

Revised Text

Part: 2 Section: 26 Rule: 260 B2 **CP2710**

Subcommittee Recommendation: Accept

Subcommittee Comment:**Vote on Subcommittee Recommendation:**

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 26 Rule: 261 261-A1b,261-1A,Table **CP2824**

Also Part:2 Section:26 261 261-A1b,261-1B,Table **SC5**

CM4719 Steve West Portland General Electric

Entire CP

CM4762 Michael Hyland American Public Power Association

Entire CP

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (23) Amato, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (1) Heald

Abstention: (1) Bullinger

Explanation of Vote:

Heald - Reasons for negative is stated in the preprint.

Revised Text

Part: 2 Section: 26 Rule: 261 A2a Exception1 **CP2781**

CM4053 Albert Zogopoulos Unitil Service Corp.

Part:2 Section:26 261 A2a Exception1

CM4063 Paul Krell Unitil

Part:2 Section:26 261 A2a Exception1

CM4073 Jacob Dusling Unitil

Part:2 Section:26 261 A2a Exception1

CM4083 Scott harding Unitil

Part:2 Section:26 261 A2a Exception1

CM4094 Mike Busby Unitil

Part:2 Section:26 261 A2a Exception1

CM4113 John Bonazoli Unitil

Part:2 Section:26 261 A2a Exception1

CM4122 Scott Shepard Unitil

Part:2 Section:26 261 A2a Exception1

CM4133 Scott Shepard SS Utility Solutions, PLLC

Part:2 Section:26 261 A2a Exception1

CM4142 Justin Eisfelleer Unitil Service Corp.

Part:2 Section:26 261 A2a Exception1

CM4156 Kevin Sprague Unitil Service Corp.

Part:2 Section:26 261 A2a Exception1

CM4162 Scott Shepard SS Utility Solutions, PLLC

Part:2 Section:26 261 A2a Exception1

CM4173 James Goudreault Unitil

Part:2 Section:26 261 A2a Exception1

CM4183 Albert Zogopoulos Self

Part:2 Section:26 261 A2a Exception1

CM4195 nathan sherwood Unitil

- Part:2 Section:26 261 A2a Exception1
CM4216 Steve West Portland General Electric
Part:2 Section:26 261 A2a Exception1
CM4246 Thomas Pritchard Jones-Onslow
Part:2 Section:26 261 A2a Exception1
CM4260 Ron Corzine Savannah Electric
Part:2 Section:26 261 A2a Exception1
CM4324 Tom Meissner Unitil
Part:2 Section:26 261 A2a Exception1
CM4326 Harold Murphy Wake Electric (Rural Electric Cooperative)
Part:2 Section:26 261 A2a Exception1
CM4460 James T Collins Southeastern Electric Exchange
Part:2 Section:26 261 A2a Exception1
CM4492 EDWARD THOMAS Utility Electrical Consultants, PC
Part:2 Section:26 261 A2a Exception1
CM4524 Thomas Haire Rutherford EMC
Part:2 Section:26 261 A2a Exception1
CM4548 Ronnie Gunnell Randolph Electric Membership Coperation
Part:2 Section:26 261 A2a Exception1
CM4584 David Sofra
Part:2 Section:26 261 A2a Exception1
CM4654 Gonzalez Gabriel BellSouth Telecommunications
Part:2 Section:26 261 A2a Exception1
CM4656 Gonzalez Gabriel BellSouth Telecommunications
Part:2 Section:26 261 A2a Exception1
CM4677 Dennis Mabe
Part:2 Section:26 261 A2a Exception1
CM4682 Mickey Gunter Georgia Power Company (Retired)
Part:2 Section:26 261 A2a Exception1
CM4818 McCachern Steven
Part:2 Section:26 261 A2a Exception1
CM4845 Jeffrey Ahearn Tideland EMC
Part:2 Section:26 261 A2a Exception1
CM4881 Donald Heald Rural Utilities Service
Part:2 Section:26 261 A2a Exception1
CM4922 Kenneth Miller Bangor Hydro-Electric
Part:2 Section:26 261 A2a Exception1
CM4927 Jay Albright Randolph Electric
Part:2 Section:26 261 A2a Exception1
CM4943 Robert Harris Four County Electric Membership Corp.
Part:2 Section:26 261 A2a Exception1
CM4957 Anthony Barrow Pitt and Greene Electric Membership Corportion
Part:2 Section:26 261 A2a Exception1
CM4968 Bob Saint NRECA
Part:2 Section:26 261 A2a Exception1

Subcommittee Recommendation: Accept as modified in 2005

Subcommittee Comment:

Contingent on ANSI O5-2005 being approved

Vote on Subcommittee Recommendation:

Affirmative: (24) Bingel, Bullinger, Burley, Chen, Clapp, Denbrock, Freimark, Fuller, Harrel, Jones, Joplin,

Kempner, Kinghorn, Kluge, Lonergan, Pehosh, Peters, Rempe, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (1) Heald

Abstention: (0)

Explanation of Vote:

Heald - SUMMARY OF THE CHANGE PROPOSAL

When designing wood pole lines, utility designers must now comply with the fiber strength mandate of ANSI O5.1, "Wood Poles - Specifications and Dimensions." If the 2002 version of ANSI O5.1 is accepted via CP 2780, designers will utilize single wood poles and unbraced H-frames that have adequate fiber stress at the point on the structure where maximum stress is expected to be applied. The designer has to determine how much stress will be applied and where it will be applied and make sure the pole can sustain it by checking the stress values included in ANSI O5.1's Table 1, "Designated Fiber Stress for Wood Utility Poles." With the acceptance of CP2781, design will now focus on the point of applied maximum stress and, as a result, this change proposal removes NESC Rule 261A2a Exception 1 because it is no longer valid.

HISTORY

The NESC has always recognized that the maximum stress point may occur above the ground. The 4th Edition of the code was published in 1949. In the commentary, the 4th edition states the following:

"It is necessary to prescribe a minimum top circumference to insure adequate strength for framing as well as to insure suitable pole proportions. The strength of poles is based on ground-line circumferences. This is because of the fact that the ground line, if not originally so, may become, through decay, the weakest section of the pole or the point where failure is most likely to occur. In species of poles having slight tapers the weakest section is always near the ground line, which for poles having excessive tapers or flaring butts the weakest section is initially at some distance above the ground line. However, even in poles of this later class the ground line will generally become the section of least resistance (in proportion to bending moment of load) before they deteriorate to the point of removal."

The actual wording in the 4th Edition for Rule 261A4 reads as follows:

"4. Wood poles shall be of such material and dimensions as to meet the following requirements (where guys are used, see rule 261C):

(a) TRANSVERSE STRENGTH. Wood poles shall withstand the transverse and vertical loads assumed in rule 252, A and B, 1 to 4, inclusive, without exceeding at the ground line for unguyed poles, or at the point of guy attachment for guyed poles, the appropriate allowable percentages of their ultimate stress given in table 20.

CHANGE IN PHILOSOPHY

If the subcommittee decides to accept this change proposal, members of the committee must recognize that they are also changing NESC long standing philosophy. Subcommittee 5 will, as a result of acceptance, no longer accept that the point of eventual weakest section as a result of decay will occur at the ground line. The past practice of sixty years will no longer be valid. The impact on span limitations when basing the calculation on the maximum stress point appears to be negligible (2-10 percent). However, this change proposal should not be considered alone as it must be considered with the sister change proposal (CP 2780) which references the 2002 version of ANSI O5.1-2002. With the acceptance of CP2780 and CP2781, decreasing fiber stress with height must be considered by users of the 2007 NESC in the design of wood pole lines.

IMPACT ON SPANS

The attached printout provides calculated spans lengths for various scenarios of a single wood pole design. The first

printout displays calculated spans based on moments at the ground line. The second printout shows calculated spans based on the maximum stress point (given a constant fiber stress with height). The third printout depicts calculated spans based on the maximum stress point considering decreasing fiber stress with height. This third printout indicates that spans will be reduced up to 30 percent from what has been previously used. Is there evidence available to indicate lines constructed under the 2002 or even previous editions of the NESC are failing and this kind of drastic change is necessary for SAFETY?

CONCEPT OF SAFETY FACTOR

In the commentary of the 4th edition of the NESC, it states that the code's "original 'factors of safety' do not have the same meaning as in many other fields of engineering, where the loads and the resisting strengths of structures against such loads are more accurately known. Wood-pole lines are essentially flexible structures and their ability to withstand the irregularly applied loading of wind and ice is proved by experience to be in excess of that calculated by the usual methods under code loading assumptions and strength requirements. In other words, the allowable stresses and loading assumptions contained in the NESC rules are only a convenient means of providing safe structures which experience has shown to be adequate in the various situations where grades B, C, or D construction is required."

The code recognizes or justifies calculating the spans based on groundline moments because of the high overload safety factors used for wood and that the point of weakest strength will, with time and decay, eventually be at the groundline.

There is another way of looking at the concept of the safety factor for wood poles. For Grade B construction, the code requires a 'safety factor' of 2.67 for transverse loads for the entire life of the wood pole. When a pole is first installed, a safety factor of 4 is required at the groundline. This means that for tall and heavy class poles, where the maximum stress point occurs above the ground line because of the taper of the pole, the actual safety factor will be slightly less than 4 above groundline but will always exceed the safety factor of 2.67. Calculating spans based on groundline moments for single pole construction and unbraced H-frames is "a convenient means of providing construction which experience has shown to be adequate in the various situations where grades B or C construction is required." In cases of braced H-frames, the maximum stress points will occur above the groundline, but these occur because of the bracing redistributing the induced moments in the poles. As such, it is necessary to calculate spans based on stresses above the groundline for braced H-frames.

Revised Text

Part: 2 Section: 26 Rule: 261 A2a, EXCEPTION 1 **CP2509**

CM4042 Dave Asgharian Utility Engineer

Part:2 Section:26 261 A2a, EXCEPTION 1

CM4377 Charles Faulds Texas Electric Cooperatives

Part:2 Section:26 261 A2a, EXCEPTION 1

CM4486 EDWARD THOMAS Utility Electrical Consultants, PC

Part:2 Section:26 261 A2a, EXCEPTION 1

CM4493 EDWARD THOMAS Utility Electrical Consultants, PC

Part:2 Section:26 261 A2a, EXCEPTION 1

CM4549 Ronnie Gunnell Randolph Electric Membership Coperation

Part:2 Section:26 261 A2a, EXCEPTION 1

CM4586 David Sofra

Part:2 Section:26 261 A2a, EXCEPTION 1

CM4651 Gonzalez Gabriel BellSouth Telecommunications

Part:2 Section:26 261 A2a, EXCEPTION 1

CM4678 Dennis Mabe

- Part:2 Section:26 261 A2a, EXCEPTION 1
CM4698 Steve West Portland General Electric
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4733 Michael Hyland American Public Power Association
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4772 Pete Montes Farmers Electric Cooperative, Inc.
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4807 McCachern Steven
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4908 Jay Albright Randolph Electric
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4945 Robert Harris Four County Electric Membership Corp.
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4958 Anthony Barrow Pitt and Greene Electric Membership Corporation
Part:2 Section:26 261 A2a, EXCEPTION 1

Subcommittee Recommendation: Reject

Subcommittee Comment:

See action CP2781

Vote on Subcommittee Recommendation:

Affirmative: (26) Bingel, Bullinger, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Heald, Jones, Joplin, Kempner, Kinghorn, Kluge, Lonergan, Pehosh, Peters, Rempe, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Slavin - Since CP2509 is essentially incorporated into CP2781, as modified in 2005, the Subcommittee Recommendation should be "Accept in Principle", and the SC5 Comment should be "See action on CP 2781 and CP 2780".

Revised Text

Part: 2 Section: 26 Rule: 261 A2a, EXCEPTION 1 **CP2510**

- CM4008 Lawrence Slavin** Alliance for Telecommunications Industry Solutions
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4329 Trevor Bowmer Telcordia Technologies
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4379 Martin Rollins North American Wood Pole Council
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4487 EDWARD THOMAS Utility Electrical Consultants, PC
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4494 EDWARD THOMAS Utility Electrical Consultants, PC
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4577 Steve West Portland General Electric
Part:2 Section:26 261 A2a, EXCEPTION 1
CM4587 David Sofra
Part:2 Section:26 261 A2a, EXCEPTION 1

- CM4732 Michael Hyland** American Public Power Association
Part:2 Section:26 261 A2a, EXCEPTION 1
- CM4809 McCachern Steven**
Part:2 Section:26 261 A2a, EXCEPTION 1
- CM4930 Kenneth Gilmore**
Part:2 Section:26 261 A2a, EXCEPTION 1
- CM4946 Robert Harris** Four County Electric Membership Corp.
Part:2 Section:26 261 A2a, EXCEPTION 1
- CM4959 Anthony Barrow** Pitt and Greene Electric Membership Corporation
Part:2 Section:26 261 A2a, EXCEPTION 1
- CM4990 Nelson Bingel** American Standards Committee O5
Part:2 Section:26 261 A2a, EXCEPTION 1
- CM4999 Rex Bullinger** National Cable & Telecommunications Association
Part:2 Section:26 261 A2a, EXCEPTION 1

Subcommittee Recommendation: Reject

Subcommittee Comment:

See action on CP2781

Vote on Subcommittee Recommendation:

Affirmative: (26) Bingel, Bullinger, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Heald, Jones, Joplin, Kempner, Kinghorn, Kluge, Lonergan, Pehosh, Peters, Rempe, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Slavin - Since CP2510 is essentially incorporated into CP2781, as modified in 2005, the Subcommittee Recommendation should be "Accept in Principle", and the Subcommittee Comment should be "See action on CP 2781 and CP 2780".

Revised Text

Part: 2 Section: 26 Rule: 261 A2b(1) **CP2780**

- CM4013 J. Michael Barringer** Southern Maryland Electric Cooperative, Inc
Part:2 Section:26 261 A2b(1)
- CM4052 Albert Zogopoulos** Unitil Service Corp.
Part:2 Section:26 261 A2b(1)
- CM4062 Paul Krell** Unitil
Part:2 Section:26 261 A2b(1)
- CM4072 Jacob Dusling** Unitil
Part:2 Section:26 261 A2b(1)
- CM4082 Scott harding** Unitil
Part:2 Section:26 261 A2b(1)
- CM4093 Mike Busby** Unitil
Part:2 Section:26 261 A2b(1)
- CM4111 John Bonazoli** Unitil
Part:2 Section:26 261 A2b(1)
- CM4121 Scott Shepard** Unitil

- Part:2 Section:26 261 A2b(1)
CM4132 Scott Shepard SS Utility Solutions, PLLC
Part:2 Section:26 261 A2b(1)
CM4141 Justin Eisfelleer Unitil Service Corp.
Part:2 Section:26 261 A2b(1)
CM4154 Kevin Sprague Unitil Service Corp.
Part:2 Section:26 261 A2b(1)
CM4161 Scott Shepard SS Utility Solutions, PLLC
Part:2 Section:26 261 A2b(1)
CM4172 James Goudreault Unitil
Part:2 Section:26 261 A2b(1)
CM4182 Albert Zogopoulos Self
Part:2 Section:26 261 A2b(1)
CM4192 nathan sherwood Unitil
Part:2 Section:26 261 A2b(1)
CM4215 Steve West Portland General Electric
Part:2 Section:26 261 A2b(1)
CM4230 John Burch nreca transmission subcommittee of the transmission and distribution committee
Part:2 Section:26 261 A2b(1)
CM4261 Ron Corzine Savannah Electric
Part:2 Section:26 261 A2b(1)
CM4323 Tom Meissner Unitil
Part:2 Section:26 261 A2b(1)
CM4327 Harold Murphy Wake Electric (Rural Electric Cooperative)
Part:2 Section:26 261 A2b(1)
CM4360 Martin Rollins Norht American
Part:2 Section:26 261 A2b(1)
CM4459 James T Collins Southeastern Electric Exchange
Part:2 Section:26 261 A2b(1)
CM4488 EDWARD THOMAS Utility Electrical Consultants, PC
Part:2 Section:26 261 A2b(1)
CM4495 EDWARD THOMAS Utility Electrical Consultants, PC
Part:2 Section:26 261 A2b(1)
CM4523 Thomas Haire Rutherford EMC
Part:2 Section:26 261 A2b(1)
CM4550 Ronnie Gunnell Randolph Electric Membership Coperation
Part:2 Section:26 261 A2b(1)
CM4585 David Sofra
Part:2 Section:26 261 A2b(1)
CM4652 Gonzalez Gabriel BellSouth Telecommunications
Part:2 Section:26 261 A2b(1)
CM4653 Gonzalez Gabriel BellSouth Telecommunications
Part:2 Section:26 261 A2b(1)
CM4817 McCachern Steven
Part:2 Section:26 261 A2b(1)
CM4857 Jeffrey Ahearn Tideland EMC
Part:2 Section:26 261 A2b(1)
CM4920 Kenneth Miller Bangor Hydro-Electric
Part:2 Section:26 261 A2b(1)
CM4921 Jerry McMullan Florida Power & Light Company
Part:2 Section:26 261 A2b(1)
CM4937 Bradley Schmidt Cass County Electic Cooperative, Inc.
Part:2 Section:26 261 A2b(1)
CM4948 Robert Harris Four County Electric Membership Corp.

Part:2 Section:26 261 A2b(1)

CM4961 Anthony Barrow Pitt and Greene Electric Membership Corporation

Part:2 Section:26 261 A2b(1)

Subcommittee Recommendation: Accept as modified in 2005

Subcommittee Comment:

Contingent on ANSI O5-2005 being approved

Vote on Subcommittee Recommendation:

Affirmative: (21) Bingel, Bullinger, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Jones, Joplin, Kempner, Kinghorn, Lonergan, Peters, Rempe, Slaviv, Standford, Vivas, Wong

Negative: (4) Heald, Kluge, Shultz, Soderberg, Jr.

Abstention: (1) Pehosh

Explanation of Vote:

Heald - THE EQUATION FOR DECREASING FIBER STRESS WITH HEIGHT WILL BE A REQUIREMENT
The change proposal indicates that ANSI O5.1 provides guidelines for reduced fiber stress values in the pole at heights above groundline. ANSI O5.1 says that the fiber stress should be reduced and when you do, use this equation to reduce the fiber stress. Article 9 of ANSI O5.1 says that values used for fiber stress should be reduced as a function of the pole height above ground using the formula $F_2 = F_1(1 - 0.5H/L)$. The equation for reduced fiber stress with height is established--it is no longer a guideline--but a requirement that one is to use this specific equation, regardless of species or how conservative this equation might be.

THE EQUATION FOR DECREASING FIBER STRESS WITH HEIGHT

The equation for reducing fiber stress with height has been in the appendix of ANSI O5.1 since the 1978 revision. The equation for decreasing fiber stress with height has been around since 1971 (see attached copy of the Forest Products Laboratory paper by Billy Bohannon). The equation has always been in the appendix of ANSI O5.1 and there is apparently good reason for it being in the appendix. According to Mr. Bohannon, "the exact relationship that might be used for design purposes is not clear from the existing data. However, the relationship as shown by Figure 7 might be sufficiently accurate for most design purposes."

The conservatism of the equation is confirmed by the attached publication 'Derivation of Nominal Strength for Wood Utility Poles', published in 2001. The authors are Ronald Wolfe, Jozsef Bodig, and Patricia Lebow. On page 4 of this document, the authors state:

"The conservatism built into the height-strength relationship in ANSI Annex A was confirmed by Bodig and others (1986b). In a study of the strength of longer poles, a series of tests was conducted on individual poles to assess change in strength with height. Table C.5 of the current ANSI standard shows that a reduction in strength with height was observed for southern pine, but not for Douglas-fir or western red cedar. The reduction in mean strength for southern pine poles was on the order of 9 % by mid-height"

We believe the equation is too conservative and does not cover all species of wood poles in ANSI O5.1. Instead of a 0.5 factor in the equation $F_2 = F_1(1 - 0.5H/L)$, could this be 0.4 or 0.3 or even 0.2? If more current data is available to verify that this equation is not too conservative for Douglas fir, western red cedar, southern pine, and western larch, then the details of this data should be presented to the NESC. And the NESC subcommittee should not approve this change until it receives this data and it indicates there are valid reasons for requiring it in the 2007 NESC for safety.

SAFETY FACTOR

The NESC recognizes that wood poles will decay and established a separate overload/load factor requirement to be

used for determining when the pole is to be replaced. For single pole structures, the code writers recognized that such determinations more than likely have to be evaluated at the groundline. As such, the basis of strength for a wood pole throughout its length for its life, is the replacement overload safety factor. For example, for Grade B construction, a pole is to be replaced when the safety factor essentially falls to 2.67. What this tells one, in essence, is that a pole must sustain the tip load with a safety factor of 2.67 throughout its length and throughout its life. Any strength you achieve above 2.67 by using a safety factor of 4 required for new construction is extra strength above groundline but is what is needed in design in case decay occurs at the groundline. What the proponents of this change proposal want to say is that this pole must sustain the tip load with a safety factor of 4 throughout its length which seems to be an unnecessary requirement.

CONCLUSION

A reduction in the fiber stress of the wood with pole height may occur. The exact equation and whether or not the equation should be species dependent is still unknown, as indicated by a reputable source (the Forest Products Laboratory). We believe that the 2002 version of ANSI O5.1 was premature in moving the equation from the appendix to the standard. It is not appropriate for the NESC to reference update reference to the 2002 version at this time.

Kluge - Although, as member of ASC O5, I submitted this proposal to bring the NESC into agreement with the latest ANSI O5.1 standard, I now believe that that standard does not properly account for the reported loss of strength in larger poles. Calculations have demonstrated that some sizes are impacted more severely than others and inconsistent to the respective size. Furthermore, the Bohanan report establishing the strength to height relationship says it only applies to actual circumferences and should not be applied when using the minimum pole class circumferences, regardless, ANSI O5.1 recommends use of that relationship with class circumferences. Therefore, I recommend NESC not recognize strength to height relationship given in ANSI O5.1, edition 2002 or 2005.

Shultz - In reviewing past revisions of ANSI O5.1, and comparing its current requirements with its earlier recommendations, I am not convinced of the validity of the specified fiber stress height reduction methodology. The information provided in Comment 4230 by Mr. John Burch of Florida Keys Electric Cooperative points out potential imprecision of the strength reduction equation and the limited sampling done with taller poles. In addition, industry experience, as reflected by public comments, does not indicate a need for this revision. I believe further data should be gathered to quantify fiber strength variation in longer (transmission size) poles before this change is implemented.

Soderberg - Based on information presented during the discussions regarding this revision, I am not convinced that transmission pole class needs to increase by the amount determined by this CP.

Revised Text

Part: 2 Section: 26 Rule: 261 A2b(2) **CP2779**

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Deleted TextPart: 2 Section: 26 Rule: 261 A2e **CP2553****CM4014 J. Michael Barringer** Southern Maryland Electric Cooperative, Inc.

Part:2 Section:26 261 A2e

CM4022 Jane Cooke Santee Cooper

Part:2 Section:26 261 A2e

CM4367 J. Reed Cooper Horry Electric Cooperative

Part:2 Section:26 261 A2e

CM4378 Charles Faulds Texas Electric Cooperatives

Part:2 Section:26 261 A2e

CM4388 Robert Higbe Santee Electric Cooperative, Inc.

Part:2 Section:26 261 A2e

CM4403 Barney Drake

Part:2 Section:26 261 A2e

CM4503 Rob Ardis Pee Dee Electric Cooperative, Inc.

Part:2 Section:26 261 A2e

CM4532 Robert Wilbur Mid-Carolina Electric Cooperative, Inc.

Part:2 Section:26 261 A2e

CM4557 Charles A. Blackmon Blue Ridge Electric Cooperative

Part:2 Section:26 261 A2e

CM4589 A. Berl Davis, Jr.

Part:2 Section:26 261 A2e

CM4603 Jason Merchant ECSC Engineering Association

Part:2 Section:26 261 A2e

CM4639 Monroe Phil Lynches River Electric Cooperative

Part:2 Section:26 261 A2e

CM4658 Gonzalez Gabriel BellSouth Telecommunications

Part:2 Section:26 261 A2e

CM4670 thomas black fairfield electric cooperative

Part:2 Section:26 261 A2e

CM4771 Robert Ott Tri-county Electric Cooperative

Part:2 Section:26 261 A2e

CM4786 Michael Hyland American Public Power Association

Part:2 Section:26 261 A2e

CM4791 Pete Montes Farmers Electric Cooperative, Inc.

Part:2 Section:26 261 A2e

CM4797 Joe Costello

Part:2 Section:26 261 A2e

CM4835 Tom Myers

Part:2 Section:26 261 A2e

CM4837 Ryan Smoak McCall-Thomas Engineering

Part:2 Section:26 261 A2e

CM4842 Tom Myers

Part:2 Section:26 261 A2e

CM4863 Tim Mobley

Part:2 Section:26 261 A2e

CM4894 Terry Williams ECSC

Part:2 Section:26 261 A2e

Subcommittee Recommendation: Accept**Subcommittee Comment:**

Vote on Subcommittee Recommendation:

Affirmative: (20) Bingel, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Jones, Kempner, Kinghorn, Kluge, Lonergan, Peters, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (5) Joplin, Heald, Shultz, Pehosh, Rempe

Abstention: (1) Bullinger

Explanation of Vote:

Bullinger - Review of comments as well as explanations of votes suggests to me that I do not have enough information to vote on this issue

Heald - See comment 4837

CM4837 - "If the rationale for removing this rule is that it is very seldom used, then other rules should also be removed for similar reasons when they are seldom used. In rural areas where small conductors are being used, electric cooperatives may need to apply this rule when determining whether to replace a weaker structure when it is discovered or being able to wait for a period of time until it becomes more feasible to either replace or reinforce the weaker pole. It actually becomes a matter of economics. Because wood strength is somewhat variable, determination of all weaker poles on a utility system could generate such a large number of units that the utility could not accomplish all the replacement work within a given time frame. This rule relieves some of that immediate line maintenance and gives utilities an opportunity to leave the weaker pole in place (on a temporary basis) if supported by adjacent stronger structures. We agree that this should not be applied to new designs and the CP should possibly be changed to apply to poles that are already in service. This rule should remain in the code to allow utilities another option to schedule, control, and manage their maintenance costs."

Kluge - The comments received were not convincing. The comments indicated that this rule was seldom used for new construction but primarily for evaluation of existing installations. When evaluating an in-service wood pole, NESC permits 1/3 loss of strength and since Rule 261A2e required the weak pole to possess 75% of the required strength, therefore, this rule had no significant value.

Pehosh - See comment 4022

CM 4022 - "Although Santee Cooper has not used this rule, we have the option of applying it if necessary. That option is taken away by completely removing the rule. If the rationale for removing the rule is that it is very seldom used to justify having a wood pole structure of less than required strength in a line, then other rules should also be removed for similar reasons when they are seldom used. Smaller utilities (Cooperatives, municipals, etc.) may need to apply this rule when determining whether to replace a weak structure at the time it is discovered or being able to wait for a period of time until it becomes more feasible to either replace or reinforce the weak pole. It actually becomes a matter of economics. Because wood strength is so variable, determination of all weak poles on a utility system could possibly be such a large number that the utility could not possibly replace all poles within a given time frame. This rule relieves some of that line maintenance and gives utilities an opportunity to leave the weak pole in place if supported by adjacent stronger structures. We agree that this should not be applied to new designs and should possibly be changed to apply to poles that are already in-service."

Rempe - See comments from Heald.

Shultz - I repeat my original comment in opposition to deleting this rule: "The rationale for removing this rule is that it is very seldom used to justify having a pole structure of less than required strength in a line. With the conditions specified in the rule, the weak structure is safely supported by the adjacent structures. Deleting this rule will have little negative consequence to the industry. Still, having the option of applying the rule could be an economical means of resolving some line maintenance problems. I prefer to leave the rule in the Code but limit its

application to in-service pole structures. I agree that it is not appropriate for new construction.”

Revised Text

Part: 2 Section: 26 Rule: 261 B, Note **CP2554**

Also Part:2 Section:26 261 C, Note SC5

Subcommittee Recommendation: Accept as Modified in 2003

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

New Text

Part: 2 Section: 26 Rule: 261 D4b Exception **CP2830**

CM4229 Robert Kluge Wisconsin Utilities Association

Part:2 Section:26 261 D4b Exception

CM4724 Steve West Portland General Electric

Part:2 Section:26 261 D4b Exception

CM5044 Allen Clapp self

Part:2 Section:26 261 D4b Exception

Subcommittee Recommendation: Accept as Modified in 2005

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (20) Amato, Burley, Busel, Byrne, Chen, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Slavin, Stanford, Vivas, Wong

Negative: (4) Clapp, Clem, Shultz, Soderberg, Jr.

Abstention: (1) Bullinger

Explanation of Vote:

Bullinger - lack of expertise and experience

Clem – Preferred wording stating that bracing members could be design as either compression or tension only members based on the structure configuration and anticipated loads.

Clapp - This action is illogical; alley arm braces are compression only. The language of the new text should be revised as follows: Crossarm braces used only to sustain unbalanced vertical loads may be designed as tension-only or compression-only members, as applicable.

Shultz - In many structural configurations the unbalanced vertical loads result in braces being loaded primarily in compression (alley arm construction is an example). The proposed wording would suggest that such braces can be designed as tension-only components. This is literally illogical and technically incorrect.

Soderberg - Prefer to use the wording as it exists in the 2002 Code.

Revised Text

Part: 2 Section: 26 Rule: 261 D4c **CP2621**

Subcommittee Recommendation: Accept as modified in 2003

Subcommittee Comment:**Vote on Subcommittee Recommendation:**

Affirmative: (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 26 Rule: 261 H **CP2644**

Also Section:2 Def Special Terms SC1

Section:9 092 C3b SC2

Section:9 097 A SC2

Part:2 Section:26 261 H1a SC5

CM4029 Steve West Portland General Electric

Section:9 092 C3b

CM4202 Gregory Obenchain Edison Electric Institute

Section:2 Def Special Terms

CM4203 Timothy Croushore Allegheny Power

Section:2 Def Special Terms

CM4270 Ron Corzine Savannah Electric

Entire CP

CM4351 J Frederick Doering self

Section:9 092 C3b

CM4419 James T Collins Southeastern Electric Exchange

Section:2 Def Special Terms

CM4425 James T Collins Southeastern Electric Exchange

Section:2 Def Special Terms

CM4816 Michael Hyland American Public Power Association

Section:9 097 A

CM4971 Keith Reese Georgia Power Company

Entire CP

CM5001 Jerry McMullan Florida Power & Light Company

Entire CP

CM5020 Allen Clapp self

Section:2 Def Special Terms

Subcommittee Recommendation: Accept as modified in 2005

Subcommittee Comment:

Accepted as modified by SC1 with the changes in comment in 4202

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (1) Clapp

Abstention: (0)

Explanation of Vote:

Clapp - P 2644 originally proposed changing the definition of “shield wire” to “overhead ground wire”. Had that been done, the additional parts of the proposal would also have been necessary to change the various rules referring to shield wire to refer to the correct term.

However, the original part of the proposal was not accepted. Although the definition of shield wire was modified and new definitions were added for surge-protection wire, static wire and overhead ground wire to refer them to the definition of shield wire, the other changes proposed by the CP were not adopted.

The attached new MRC file for CP 2644 sent as a part of the Subcommittee 5 package for voting shows part (a) of the proposal as modified by SC1. However, the rest of the proposal to change the interior rule terms was not adopted. As a result, our record of this action is not correct and is contradictory.

In (b), the term in the Exception to 092C3b should not change from “static wire” to “ground wire”; it should change to “shield wire”, so that it will include grounded overhead shield wires, static wires, and ground wires, however they are called in anyone’s system.

In (c), there is a bolded term at the end of 097A that indicates that the rule does not apply to “overhead ground wires.” That is not correct. Present Rule 097A3 applies to overhead shield wires. That language should not be added.

In (d), the reference in both 261H and 261H1a should remain “shield wire” to be all-inclusive.

In (e), the Index reference would remain to shield wires, not ground wires.

In (f), the reference should change from the old name in the Definitions “Shield wire/conductor” to the new name per the action on CP 2644 “shield wire”.

In (g), the reference to “shield” wires should not change for Rule 261H.

I have no problem with changing only the definitions. However, the changes that Bill Ash has on record shows that we are also making the other changes originally proposed by the CP when the rejected language was assumed by the proposer to flow through to various rules and index references. As a result, we need to take action to reject all changes except the definitions and the one necessary change to the index and (maybe) the one other change I indicated. Otherwise, it gets all screwed up because the original proposal would have changed all those Rules and references to use the term "overhead ground wire" instead of "shield wire." If that happens, it appears to eliminate

application to something that someone calls a shield wire or static wire. Since all of those terms are in effective use, we changed the definitions to match current usage. Therefore, we need to take action to keep the other half of the proposal from taking effect, as all those other incorrect changes are still incorrectly shown in Bill Ash's records as being intended to be made. We need a vote to be clear on the subject for all concerned.

Revised Text

Part: 2 Section: 26 Rule: 261 H1 **CP2768**

CM4262 Ron Corzine Savannah Electric

Part:2 Section:26 261 H1

CM4295 Gregory Obenchain Edison Electric Institute

Part:2 Section:26 261 H1

CM4458 James T Collins Southeastern Electric Exchange

Part:2 Section:26 261 H1

Subcommittee Recommendation: Accept as modified in 2005

Subcommittee Comment:**Vote on Subcommittee Recommendation:**

Affirmative: (22) Bingel, Burley, Chen, Clapp, Denbrock, Freimark, Fuller, Harrel, Heald, Jones, Joplin, Kempner, Kluge, Pehosh, Peters, Rempe, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (2) Bullinger, Lonergan

Explanation of Vote:

Bullinger - Lack of expertise

Lonergan - I do not have sufficient knowledge on this subject

Revised Text

Part: 2 Section: 26 Rule: 261 H1 **CP2791**

Subcommittee Recommendation: Accept as Modified in 2003

Subcommittee Comment:**Vote on Subcommittee Recommendation:**

Affirmative: (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:**Revised Text**

Part: 2 Section: 26 Rule: 261 J **CP2792**

CM4739 Michael Hyland American Public Power Association
Part:2 Section:26 261 J

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 26 Rule: 261 L1b **CP2797**

Subcommittee Recommendation: Accept as modified in 2003

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Deleted TextPart: 2 Section: 26 Rule: 261 L2 **CP2810**

CM4740 Michael Hyland American Public Power Association
Part:2 Section:26 261 L2

Subcommittee Recommendation: Accept as Modified in 2005**Subcommittee Comment:****Vote on Subcommittee Recommendation:**

Affirmative: (24) Bingel, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Heald, Jones, Joplin, Kempner, Kluge, Lonergan, Pehosh, Peters, Rempe, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (1) Bullinger

Abstention: (0)

Explanation of Vote:

Bullinger - This is not a valid CP. See NESC procedures 10.1.3(1). Need "exact change, rewording, or new material proposed." I agree with his rule because NESC crafting done by "wordsmithing on the fly" in a "design by committee" mode has risks. This mode of code crafting does not benefit from being a draft, sleeping on it, further preprint review, and then final action on the CP. Such major changes just prior to the vote is not proper procedure.

New TextPart: 2 Section: 26 Rule: 261 N **CP2709**

CM4294 Gregory Obenchain Edison Electric Institute
Part:2 Section:26 261 N

CM4359 J. Reed Cooper
Part:2 Section:26 261 N

CM4391 Robert Higbe Santee Electric Cooperative, Inc.
Part:2 Section:26 261 N

CM4414 Barney Drake
Part:2 Section:26 261 N

CM4453 James T Collins Southeastern Electric Exchange
Part:2 Section:26 261 N

CM4509 Rob Ardis Pee Dee Electric Cooperative, Inc.
Part:2 Section:26 261 N

CM4540 Robert Wilbur Mid-Carolina Electric Cooperative, Inc.
Part:2 Section:26 261 N

CM4566 Charles A. Blackmon Blue Ridge Electric Cooperative, Inc.
Part:2 Section:26 261 N

CM4602 A. Berl Davis, Jr.
Part:2 Section:26 261 N

CM4614 Jason Merchant ECSC Engineering Association
Part:2 Section:26 261 N

CM4662 Monroe Phil Lynches River Electric Cooperative
Part:2 Section:26 261 N

CM4696 thomas black fairfield electric cooperative
Part:2 Section:26 261 N

CM4784 Robert Ott Tri-county Electric Cooperative
Part:2 Section:26 261 N

CM4803 Joe Costello

Part:2 Section:26 261 N

CM4852 Tom Myers

Part:2 Section:26 261 N

CM4869 Tim Mobley

Part:2 Section:26 261 N

CM4887 Terry Williams ECSC INC

Part:2 Section:26 261 N

Subcommittee Recommendation: Accept as modified in 2005**Subcommittee Comment:**

Modified by comment 4294

Vote on Subcommittee Recommendation:**Affirmative:** (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

New TextPart: 2 Section: 26 Rule: 261 N **CP2776****Subcommittee Recommendation:** Accept in Principle**Subcommittee Comment:**

See action on CP 2709

Vote on Subcommittee Recommendation:**Affirmative:** (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

New TextPart: 2 Section: 26 Rule: 261 Table 261-1A **CP2614****CM4747 Michael Hyland American Public Power Association**

Part:2 Section:26 261 Table 261-1A

Subcommittee Recommendation: Accept in Principle

Subcommittee Comment:

See CP 2824

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bingel, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (1) Heald

Abstention: (1) Bullinger

Explanation of Vote:

Bullinger - I had previously voted Negative reasoning that the CP became too broad beyond the original Interpretation Request. Discussion since then has reduced my concern but not enough to vote Affirmative.

Heald - Reasons for negative are stated in the preprint. No other information has been submitted to change my vote.

Revised Text

Part: 2 Section: 26 Rule: 261 Table 261-1A **CP2720**

CM4234 Robert Kluge Wisconsin Utilities Association

Part:2 Section:26 261 Table 261-1A

Subcommittee Recommendation: Reject

Subcommittee Comment:

For reasons stated in the Preprint

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bingel, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (1) Kluge

Abstention: (1) Bullinger

Explanation of Vote:

Bullinger – Lack of expertise.

Kluge – See comment by Wisconsin Utilities Association. This change would be consistent with Rule 214A2

New Text

Part: 2 Section: 26 Rule: 261 Table 261-1B **CP2615**

CM4231 Robert Kluge Wisconsin Utilities Association

Part:2 Section:26 261 Table 261-1B

CM4748 Michael Hyland American Public Power Association

Part:2 Section:26 261 Table 261-1B

Subcommittee Recommendation: Accept in Principle

Subcommittee Comment:

See CP2824

Vote on Subcommittee Recommendation:

Affirmative: (24) Amato, Bingel, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (1) Heald

Abstention: (1) Bullinger

Explanation of Vote:

Bullinger - I had previously voted Negative reasoning that the CP became too broad beyond the original Interpretation Request. Discussion since then has reduced my concern but not enough to vote Affirmative.

Heald - Reasons for negative are stated in the preprint. No other information has been submitted to change my vote.

Revised Text

Part: 2 Section: 26 Rule: 263 Table 263-1 **CP2619**

Subcommittee Recommendation: Accept

Subcommittee Comment:

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: 2 Section: 26 Rule: 264 E **CP2616**

CM4296 Gregory Obenchain Edison Electric Institute

Part:2 Section:26 264 E

CM4451 James T Collins Southeastern Electric Exchange

Part:2 Section:26 264 E

Subcommittee Recommendation: Accept as Modified in 2005

Subcommittee Comment:

Modified by CM 4296

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Stanford, Vivas, Wong

Negative: (1) Soderberg, Jr.

Abstention: (0)

Explanation of Vote:

Soderberg - The guy markers and protection Rule is easy to find as is. This adds additional wording (reference to another Rule) without adding safety. The move and additional wording make the Code less user friendly.

Revised Text

Part: 2 Section: 26 Rule: 264 E3 **CP2761**

Subcommittee Recommendation: Reject

Subcommittee Comment:

See CP2616 and CP2600

Vote on Subcommittee Recommendation:

Affirmative: (24) Bingel, Bullinger, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Heald, Jones, Joplin, Kempner, Kluge, Lonergan, Pehosh, Peters, Rempe, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas

Negative: (0)

Abstention: (0)

Explanation of Vote:**Deleted Text**

Part: 2 Section: 27 Rule: 270 **CP2536**

Subcommittee Recommendation: Accept in principle

Subcommittee Comment:

Errata has been issue to fix.

Vote on Subcommittee Recommendation:

Affirmative: (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised TextPart: 2 Section: 27 Rule: 270 **CP2762****Subcommittee Recommendation:** Accept in Principle**Subcommittee Comment:**

See CP2536

Vote on Subcommittee Recommendation:**Affirmative:** (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

Revised TextPart: 2 Section: 27 Rule: 279 **CP2650****Subcommittee Recommendation:** Reject**Subcommittee Comment:**

For reasons stated in the Preprint

Vote on Subcommittee Recommendation:**Affirmative:** (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

Revised TextPart: 2 Section: 27 Rule: 279 **CP2834***Also Part:2 Section:21 215 C2 SC4***CM4238 Robert Kluge**

Part:2 Section:21 215 C2

CM4445 James T Collins Southeastern Electric Exchange

Part:2 Section:21 215 C2

CM4932 Jerry McMullan Florida Power & Light Company

Part:2 Section:21 215 C2

CM4962 James Bohlk USDA Rural Utilities Service

Part:2 Section:21 215 C2

Subcommittee Recommendation: Accept

Subcommittee Comment:**Vote on Subcommittee Recommendation:**

Affirmative: (25) Bingel, Bullinger, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Heald, Jones, Joplin, Kempner, Kinghorn, Kluge, Pehosh, Peters, Rempe, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (1) Lonergan

Explanation of Vote:

Lonergan - I do not have sufficient knowledge on this subject

Revised Text

Part: 2 Section: 27 Rule: 279 A2a **CP2611**

Subcommittee Recommendation: Accept

Subcommittee Comment:

Forward action to SC4 to incorporate into CP2834

Vote on Subcommittee Recommendation:

Affirmative: (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:**Revised Text**

Part: 2 Section: 27 Rule: 279 A2a **CP2719**

Subcommittee Recommendation: Reject

Subcommittee Comment:

For reasons stated in the Preprint. Forward action to SC4 for incorporation into CP2834

Vote on Subcommittee Recommendation:

Affirmative: (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised TextPart: 2 Section: 27 Rule: 279 A2b(2) **CP2555****CM4723 Michael Hyland** American Public Power Association

Part:2 Section:27 279 A2b(2)

CM5011 Allen Clapp self

Part:2 Section:27 279 A2b(2)

Subcommittee Recommendation: Accept**Subcommittee Comment:**

Forward action to SC4 to incorporate into CP2834.

Vote on Subcommittee Recommendation:**Affirmative:** (23) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clem, Denbrock, Freimark, Harrel, Jones, Kempner, Kinghorn, Kluge, Peters, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (3) Clapp, Heald, Rempe**Abstention:** (0)**Explanation of Vote:**

Clapp - See Preprint

Heald - The comment by Alan Clapp in the Preprint persuaded me to vote negative to this CP.

Rempe - See comments from Heald

New TextPart: 2 Section: 27 Rule: 279 A2b(2) **CP2728****CM4232 Robert Kluge** Wisconsin Utilities Association

Part:2 Section:27 279 A2b(2)

CM4528 J Frederick Doering Self

Part:2 Section:27 279 A2b(2)

Subcommittee Recommendation: Accept in Principle**Subcommittee Comment:**

See action on CP2729

Vote on Subcommittee Recommendation:**Affirmative:** (23) Bingel, Bullinger, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Jones, Joplin, Kempner, Kinghorn, Kluge, Pehosh, Peters, Rempe, Shultz, Soderberg, Jr., Standford, Vivas, Wong**Negative:** (0)**Abstention:** (1) Slavin**Explanation of Vote:**

New TextPart: 2 Section: 27 Rule: 279 A2b(3) **CP2729****CM4534 J Frederick Doering Self**

Part:2 Section:27 279 A2b(3)

CM5031 Allen Clapp self

Part:2 Section:27 279 A2b(3)

Subcommittee Recommendation: Accept as Modified in 2005**Subcommittee Comment:****Vote on Subcommittee Recommendation:****Affirmative:** (23) Bingel, Bullinger, Burley, Chen, Clapp, Clem, Denbrock, Freimark, Fuller, Harrel, Jones, Joplin, Kempner, Kinghorn, Kluge, Pehosh, Peters, Rempe, Shultz, Soderberg, Jr., Stanford, Vivas, Wong**Negative:** (0)**Abstention:** (1) Slavin**Explanation of Vote:**

New TextPart: 2 Section: 27 Rule: 279 A3 **CP2620****Subcommittee Recommendation:** Accept as Modified in 2005**Subcommittee Comment:**

Figured is to be incorporated in the code with titled and the removal of material specifics.

Vote on Subcommittee Recommendation:**Affirmative:** (26) Amato, Bingel, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Stanford, Vivas, Wong**Negative:** (0)**Abstention:** (0)**Explanation of Vote:**

New TextPart: B Rule: 250 Appendix B **CP2784****CM4461 James T Collins Southeastern Electric Exchange**

250 Appendix B

CM5051 CHUCK AMRHYN Self

250 Appendix B

Subcommittee Recommendation: Accept as Modified in 2005**Subcommittee Comment:**

Add the correction from CM5051

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Revised Text

Part: B Rule: 264 E for Index **CP2823**

CM4718 Michael Hyland American Public Power Association
264 E for Index

Subcommittee Recommendation: Accept in Principle

Subcommittee Comment:

Guy Markers moved to Rule 217 by CP2834

Vote on Subcommittee Recommendation:

Affirmative: (25) Amato, Bullinger, Burley, Busel, Byrne, Chen, Clapp, Clem, Denbrock, Freimark, Harrel, Heald, Jones, Kempner, Kinghorn, Kluge, Peters, Rempe, Schwalm, Shultz, Slavin, Soderberg, Jr., Standford, Vivas, Wong

Negative: (0)

Abstention: (0)

Explanation of Vote:

Meeting Conclusion:

5.1.5 Review/Update, as required, the Extreme Wind Methodology

Scope: Review current extreme wind methodology within the current NESC code. The purpose of this review will determine if the methodology is consistent with National and International wind engineering practice as applied to distribution and transmission line facilities. An attempt will be made to provide a simplified approach, which is consistent with the recommended methodology

Members: Chair L. Kempner, Kluge, Wong, Bingel, Fuller, Burley, Lacoursiere-Canada Liaison, Shultz, TBD (Peyrot, Peterka, Ghannoum, Others???)