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Preprint Proposals for the 2022 Edition of the National Electrical Safety Code® (NESC®)





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Foreword

This publication has been prepared to provide all interested persons an opportunity to study and comment on the Proposed Revisions to be incorporated into the 2022 Edition of the National Electrical Safety Code® (NESC®).

This Preprint provides the full text of each proposal to revise the 2017 Edition of the NESC together with the recommendation of the subcommittee that has cognizance of the rule addressed by the change proposal (CP). A change bar, located in the left-hand margin, signifies the specific material that each of the various subcommittees has approved for the inclusion in the revised Code.

The deadline for receipt of comments on the proposed revisions contained herein is 1 March 2020. Only comments that are submitted electronically through the website will be accepted. Comments for each separate topic are to be uploaded separately and must use the NESC comment template. The template, instructions, FAQs, and additional information can be found on the NESC website at:

https://standards.ieee.org/products-services/nesc/form.html

In those cases where a single CP or a group of related CPs affects rules within the scope of two or more subcommittees, the recommendations of all subcommittees affected are included. Where there are recommendations of two or more subcommittees, a recommendation by NESC Subcommittee 1, which is responsible for coordination, is also included as the final proposed change in this phase of the NESC revision cycle.

Please note that the subcommittee recommendations herein are subject to further review and revision by the cognizant subcommittee following study and evaluation of all comments received in the Fall of 2020. The subcommittee final recommendation will be prepared for a February 2021 letter ballot of the National Electrical Safety Code Committee. It is anticipated that the approved text will be submitted for American National Standards Institute approval in May 2021, with publication of the NESC 2022 Edition on 1 August 2021.

If you have any questions, please contact NESC-support@ieee.org at the IEEE Standards Association.

PDF Instructions

This PDF has the following navigation options:

1) All CP numbers listed under Subcommittee Comments are linked to the actual CP. Use the hand tool to click on the CP number and automatically be taken to the proposed change. This applies to “See CP” and “See action taken on CP” comments.

2) Previous View and Next View are toolbar buttons in the current versions of Adobe® Acrobat® software. Using them enables navigation between the Subcommittee Comments and the proposed change. If these buttons do not appear in the toolbar, follow instructions for adding them in the software being used.

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Call for Comment on Specific NESC Change Proposals

The publication of the 2022 NESC Preprint is an important opportunity for all stakeholders to provide comment on the Change Proposals (CPs) received and initial recommendations made by the NESC Subcommittees. As such, the broadest possible input is solicited and all interested and affected parties are encouraged to provide comment. For over 30 CPs, NESC Subcommittees have specifically requested public comment from affected interests.

Sections 1, 2, and 3

CP5049, Rule 010 C
CP5049 seeks to clarify purpose (Rule 010) of the NESC with regard to abnormal events (e.g., weather). Public comments for this change proposal are encouraged.

CP5542, Rule 017 A
CP5542 recommends that customary units (inch-foot) units be placed in the primary position in NESC text, and that metric (SI) units be placed in the secondary position, in parentheses. The CP further recommends that separate customary and metric unit tables and figures be created, and that the metric tables and figures be placed in an annex or appendix. NESC Subcommittee 1 recommends the use of normative annexes for the next edition so that if separated, the metric tables will continue to be recognized as part of the Code. Public comments for this change proposal are encouraged.

CP5424, Definition: joint use
NESC Subcommittee 1 is requesting public comments on CP5424 for a definition of joint use, as the action taken by NESC Subcommittee 1 differs from the action taken by NESC Subcommittee 4.

CP5104, Appendix B
NESC Subcommittee 1 is seeking comments on CP5104. NESC Subcommittee 1 has no majority position, pending outcome of public comments on other change proposals addressing the k-factor. See also CP5570 and CP5571.

Section 9, Grounding Methods

CP5287, Rule 094 B2
NESC Subcommittee 2 recognizes the action taken on CP5287 represents a substantial change with regard to requirements for driven rods. NESC Subcommittee 2 seeks public comments especially in the form of analysis and consequences associated with this proposed rule change.

Part 1: Electric Supply Stations

CP 5006, Rules 140–146
NESC Subcommittee 3 seeks public comment on CP5006, a comprehensive revision of Section 14, Storage Batteries, to recognize new battery technologies, applications, and their hazards.

CP 5452, Rule 190
NESC Subcommittee 3 seeks public comment on CP5452, which proposes to replace the existing Section 19 with a new section covering new and emerging electric generation station technologies. The proposal's initial focus is on photovoltaic (PV) generating stations.

Part 2: Installation and Maintenance of Overhead Electric Supply and Communication Lines

CP5096, Rule 215 C2, C3
NESC Subcommittee 4 is seeking public comment on CP5096. NESC Subcommittee 4 voted to reject this CP but the vote outcome was not a strong majority.

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The proposal is to require line designers to consider a wide variety of field situations created by a broken or slake anchor guy wire. A majority of the subcommittee members felt the proposed rule could not be practically applied and would result in confusion for many designers. The CP as written is ineffective for the industry to universally apply and poorly understood on joint-use pole applications as seen in the 2012 Edition of the NESC. Effectively grounding and bonding the communication messenger to initiate the supply system protective devices is a better solution for safety. Communication work rules require a communication worker to test for voltage prior to performing work that mitigates the safety concern around "voltage transfer." NESC Subcommittee 4 encourages individuals to consider the negative vote comments and offer public comments.

CP5332, Rule 233 C2, C3, C3c
See action taken on CP5196. This CP and CP5196 address identified issues within the Code but take differing approaches. The intent is to clarify the approach to increasing the clearance between conductors supported on different structures and where the voltage between the conductors exceeds 22 kV. NESC Subcommittee 4 is requesting specific comments on these two proposals during the public comment period.

CP5334, Rule 233 Table 233-1
See action taken on CP5196. This CP and CP5196 address identified issues within the Code but take differing approaches. The intent is to clarify the approach to increasing the clearance between conductors supported on different structures and where the voltage between the conductors exceeds 22 kV. NESC Subcommittee 4 is requesting specific comments on these two proposals during the public comment period.

CP5335, Rule 233 Table 233-2, Footnotes 1, 2
See action taken on CP5332. This CP and CP5332 address identified issues within the Code but take differing approaches. The intent is to clarify the approach to increasing the clearance between conductors supported on different structures and where the voltage between the conductors exceeds 22 kV. NESC Subcommittee 4 is requesting specific comments on these two proposals during the public comment period.

CP5337, Rule 233 Table 233-3
See action taken on CP5332. This CP and CP5332 address identified issues within the Code but take differing approaches. The intent is to clarify the approach to increasing the clearance between conductors supported on different structures and where the voltage between the conductors exceeds 22 kV. NESC Subcommittee 4 is requesting specific comments on these two proposals during the public comment period.

CP5591, Rule 234 Table 234-1
NESC Subcommittee 4 believes CP5591 presents a positive approach to considering conductor wind displacement for clearances to buildings, but that it is not fully developed regarding supporting structures. NESC Subcommittee 4 is seeking public comment on the general approach this CP is proposing.

CP5592, Rule 234 Table 234-2
NESC Subcommittee 4 feels CP5592 presents a positive approach to considering conductor wind displacement for clearances to buildings, but that it is not fully developed regarding supporting structures. NESC Subcommittee 4 is seeking public comment on the general approach this CP is proposing.

CP5595, Rule 224 A
NESC Interpretation Request (IR) 575, Rule 224A and Rule 238D for the 2012 Edition was considered by the Interpretations Subcommittee but consensus could not be reached. NESC Subcommittee 4 formed a Task Force to prepare a report for inclusion in the Preprint for public comment. See CP5595, CP5603, and CP5604 for proposed changes to Rule 224A and Rule 235A2 as recommended by NESC Task Force 4.5.

CP5603, Rule 224 A
NESC Interpretation Request (IR) 575, Rule 224A and Rule 238D for the 2012 Edition was considered by the Interpretations Subcommittee but consensus could not be reached. NESC Subcommittee 4 formed a Task Force to prepare a report for inclusion in the Preprint for public comment. See CP5595, CP5603, and CP5604 for proposed changes to Rule 224A and Rule 235A2 as recommended by NESC Task Force 4.5.

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CP5604, Rule 235 A2
NESC Interpretation Request (IR) 575, Rule 224A and Rule 238D for the 2012 Edition was considered by the Interpretations Subcommittee but consensus could not be reached. NESC Subcommittee 4 formed a Task Force to prepare a report for inclusion in the Preprint for public comment. See CP5595, CP5603, and CP5604 for proposed changes to Rule 224A and Rule 235A2 as recommended by NESC Task Force 4.5.

CP5027, Rule 238
NESC Subcommittee 4 is seeking public comment on the proposed changes. The intent of the subcommittee is to consolidate the antenna rules into a single location to clarify the required antenna rules and to treat antennas as equipment consistently throughout the Code.

CP5152, Rule 235 Table 235-6, row 2
The intent of this CP was to simplify the clearance rules for guys and guy anchors. NESC Subcommittee 4 believes that the modified CP is a first good step but specifically seeks comments on the proposed guy clearances.

CP5570, Rule 230 B4 (Subcommittee 4)
CP5571, Rule 251 B3 (Subcommittee 5)
A Joint Subcommittee 4/5 WG was tasked with developing change proposals relative to the k-factor (additive constant) for several rules in Part 2. Public comment is invited for these CPs. Additionally, several other CPs were submitted relative to this topic: see CPs 5440, 5441, 5442, 5443, 5444, 5445, 5446, and 5447.

The subcommittees are seeking the opinion of the professional electrical utility community as related to the following:

- Does the k-factor require revision?
- The impact of the CPs if implemented.
- Data that would support your opinion.
- Alternatives that could be considered by the Joint Subcommittee.
    - Do any of the related CPs noted above address the issue more effectively?

See also CP5104.

CP5517, Rule 250 C
CP5589, Rule 250 C
CP5590, Rule 253
CP5267, Rule 253
NESC Subcommittee 5, through extensive discussion as to how to update Rule 250C, developed two approaches. Both CPs eliminate the Importance Factor (I = 1.0) from the equations. The Importance Factor is now included in the wind speed maps.

The subcommittee is seeking to adopt a wind map philosophy that is consistent with Industry Standard ASCE 7-16 and Manual of Practice ASCE 74-19, and addresses the change in these documents for extreme wind maps and their implementation for the safety to utility workers and the public.

The wind map currently used for Rule 250C in the NESC 2017 edition is a non-uniform hazard wind map combining wind hazards of 50-year MRI for continental winds, and approximately 90-year MRI for hurricane winds along the east and southeastern states.

CP5517 adopts the 100-year Mean Recurrence Interval (MRI) 3 s gust wind speed map of ASCE 7-16 (Appendix CC, Serviceability Considerations). *This map would be applicable to both Grade B and Grade C, with Load Factors (LF) from Table 253-1 without Note 7.* In general, the 100-year MRI map is not significantly different from the current map with some localized exceptions. Note that Table 253-1 contains a 0.87 load factor that is applied to the Rule 250C wind load for Grade C structures that effectively make the resultant comparable to a 50-year MRI wind. A load factor of 1.0 is applied for Grade B.

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CP 5589 addresses the application of wind maps per the grade of construction, as follows:

Grade of construction	ASCE 7-16 Mean Recurrence Interval (MRI) [3 s gust wind speed map recorded at 33 ft (10 m) above ground]
B	100 year MRI in mph (m/s) with a LF = 1.0
C	50 year MRI in mph (m/s) with a LF = 1.0

NESC Subcommittee 5 seeks the opinion of the professional utility engineering community as to the best approach between CPs 5517and 5590 and CPs 5589 and 5267.

CP5426, Rule 250 D
NESC Subcommittee 5 would like feedback from those reviewing the proposed 2022 CPs as to any concerns with adopting the latest version of the 100-year Mean Recurrence Interval (MRI) Uniform Ice Thickness Map with 3 s gust speeds to be found in Manual of Practice ASCE 74-19.

CP5453, Rule 250 C
CP5454, Rule 250 D
CP5466, Rule 250 C
CP5467, Rule 250 D
The listed CPs would, in effect, reduce or eliminate exemptions from the additional load cases listed on Rules 250C and 250D for structures supporting lines not exceeding 60 ft above local grade or water level.

As shown in various load cases, structures supporting relatively small conductors are governed by Rule 250B. The Rule 250B loading district and applied grade of construction will determine which conductor sizes would be governed by Rule 250B loads versus Rules 250C and 250D load cases.

As shown in the Preprint, SC5 modified both CPs 5453 and 5454 in such a fashion as to effectively avoid change to the current approaches to the structures supporting lines that do not exceed 60 ft above grade or water level.

NESC Subcommittee 5 would like feedback from the professional electrical utility community as related to the following:

- Do the original CPs have merit (prior to modification)?
- Would selective exemptions be appropriate? For example: Lines exceeding 22 kV to ground that cross rural/agricultural areas could be constructed to Grade C.

NESC Subcommittee 5 would like feedback from the professional electrical utility community on the concept of requiring all structures, regardless of height, to be subject to Rule 250C and Rule 250D load cases in addition to load cases of Rule 250B.

- The impact of the CPs requiring all structures to be subject to Rules 250C and 250D load cases if implemented.
- Data that would support this opinion.
- Alternatives that could be considered by the Joint Subcommittee.
  - Do any of the related CPs noted above address the issue more effectively? In particular, are CP5353 and CP5354 (discussed following) the most appropriate options?
- Should we simply leave the rules alone?

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CP5467, Rule 250 D
Based on discussion within NESC Subcommittee 5, there was concern as to the validity of applying exposure category B and the concept being more design-based in nature. Utilities would be unable to utilize exposure category B considering exposure categories may change over time. Moreover, industry experience has shown the effects of secondary damage to be largely responsible for failures on shorter structures during extreme wind or combined ice and wind events. Therefore the proposed change is not perceived to improve safety. The proposed change would present inconsistencies with the current gust response factors in the Code.

CP5465, Rule 250 A3
CP5471, Rule 250 Table 250-2
NESC Subcommittee 5 would like feedback from those reviewing the proposed 2022 CPs as to the value of including conditions for the use of ASCE 74-10 Exposure Category B for lines and structures that do not exceed 60 ft.

Part 3: Underground Lines

CP5411, Rule 315 A4
NESC Subcommittee 7 notes that the referenced standards, IEEE Std 487-2007, IEEE Standard for the Electrical Protection of Communications Facilities Serving Electric Supply Locations—General Considerations, and IEEE Std 1590-2003, IEEE Recommended Practice for the Electrical Protection of Communication Facilities Serving Electric Supply Locations Using Optical Fiber Systems, have been revised since 2007 and 2003. The most recent version of IEEE Std 487 is IEEE Std 487-2015 and the most recent version of IEEE Std 1590 is IEEE Std 1590-2009. NESC Subcommittee 7 seeks comments regarding whether it is appropriate to update the Note associated with this rule to identify the most current version of these IEEE standards.

CP5520, Rule 380 E
This CP has the potential to require utilities to maintain different types of transformers with different insulating liquid types. Additionally, Rule 152A is in regard to substations generally under the control of a single entity and differs from the conditions associated with pad-mounted equipment near buildings. NESC Subcommittee 7 is also concerned that use of the term “minimized” is vague as part of a “shall” rule.

Part 4: Work Rules

CP5528, Rule 441 A3f
Covering neutrals is required in Rule 441A3a; additional information is needed about covering conductive objects. NESC Subcommittee 8 will work with the submitter to respond to NESC Subcommittee 8’s questions in the public comment period, and also seeks additional public comment.

CP5600, Table 410-4
NESC Subcommittee 8 and Working Group 8.16 request public comment on CP5600 regarding a proposed new Table 410-4 that addresses live-front transformers, live-front terminations, and horizontally racked circuit breakers, based on recent new arc flash testing.

NOTE: All submitted CPs are included in the Preprint. A number of proposals were withdrawn by the submitters during the NESC Subcommittee meetings that took place to review proposals. These withdrawn CPs are no longer open for comment, since there was no action taken by the cognizant subcommittee. They are included in the Preprint Proposals for the 2022 Edition of the NESC is a matter of historical record.

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Procedure for Revising the National Electrical Safety Code

1. Preparation of change proposals for amendment

1.1 A proposal may be prepared by any

a) Substantially interested person
b) Interested organization
c) NESC Subcommittee
d) Member of the NESC Committee or its subcommittees

1.2 Change proposal submittal

Change proposals shall be submitted to: Secretary, National Electrical Safety Code Committee using the change proposal form (template) via the IEEE NESC website, https://standards.ieee.org/products-services/nesc/form.html.

1.3 Each separate rule change shall begin on a separate change proposal form. The change proposal shall consist of:

a) A statement, in NESC rule form, of the exact change, rewording or new material proposed;
b) The name of the submitter (organization or individual as applicable);
c) Supporting comments, giving the reasons why the NESC should be so revised.

2. Secretariat action

The Secretariat shall:

a) Determine if the change proposal is in the proper format and contains all information necessary to make it acceptable for processing. If it is incomplete or otherwise fails to meet the requirements for processing, the Secretary shall return it to the submitter for completion or revision;
b) Determine if the change proposal is to be considered through the Standard or Fast-Track Revision Process;
c) Acknowledge receipt of proposals for revision. (If the submitter does not receive an acknowledgment within 30 days of submission, the submitter should contact the Secretariat);
d) Distribute to each member of the appropriate NESC subcommittee all of the proposals received, arranged in a coordinated sequence.

2.1 Standard revision process

The revision process shall follow the revision schedule published in the version of the National Electrical Safety Code under revision, or as amended and as appears on the NESC website.

3. Technical Subcommittee recommendation

The NESC subcommittee responsible shall consider each proposal and take one or more of the following steps:

a) Endorse the proposal as received.

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b) Prepare a proposed revision or addition for the NESC (this may be a coordination of several comments or a committee consensus on a modification of a proposal).

c) Refer the proposal to a technical working group or task force for detailed consideration.

d) Request coordination with other NESC Subcommittees

e) Recommend rejection of the proposal for stated reasons.

For each item, a subcommittee voting statement shall be prepared, accompanied by members' statements concerning their votes (cogent reasons are required for negative and abstention votes).

4. Preprint of proposals

The Secretariat shall organize and publish a Preprint of proposed revisions including:

a) Each main committee and subcommittee member identified by category and affiliation;

b) The original proposal as received from the submitter;

c) The recommendation of the subcommittee with respect to the proposal (including a voting statement and subcommittee members' statements);

d) Information regarding submittal forms (templates) for comments.

The Preprint shall be distributed to all members of NESC subcommittees and the representatives of the organizations comprising the NESC Main Committee. Printed and/or electronic copies shall be available for sale to all interested parties. Notice of availability of the Preprint shall be submitted to ANSI for publication in ANSI Standards Action. The Preprint shall carry information on how to submit comments on the proposals and the final date for such submissions.

5. Final processing of proposed revisions and comments

Following the public review period, the Secretariat shall organize and distribute for subcommittee consideration all comments received.

5.1 Review of public comments

The Preprint and the public comments received shall be considered by the subcommittees. Change proposals on new or significantly different issues may not be considered. Substantive changes in the ballot draft from the recommendations in the Preprint shall be appropriately noted. The subcommittee may take the following actions:

a) The subcommittee may recommend adoption or rejection of the proposal by majority vote.

b) When extended technical consideration or resolution of differing or conflicting points of view is necessary, the subcommittee may refer the problem to a working group of the subcommittee for proposed resolution. If expeditious consideration is not possible, the subject shall be held on the docket.

c) Each working group shall provide, to its parent subcommittee, recommendations on matters considered as a result of subcommittee referrals under items a) and b) above.

d) Each subcommittee shall prepare a report showing its proposed revisions and all items to be held on the docket together with a plan for their disposition.

e) The Secretary shall provide commenters with copies of reports of actions taken on the rules affected by their comments, and shall make all such reports available for examination upon request.

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6. Final approval

Based upon the subcommittee reports, the Secretariat shall prepare a draft revision of the NESC and distribute copies to:

a) The NESC Main Committee for approval by a 30-day letter ballot;
b) The American National Standards Institute for concurrent 45-day public review in ANSI Standards Action.

6.1 Comments received in response to the letter ballot and public review shall be considered by the Executive Subcommittee. Since technical changes on new or significantly different issues are not allowed during this time, any new or significantly different technical change that is suggested shall be sent by the Executive Subcommittee to the appropriate cognizant technical subcommittee for consideration for the next revision cycle. The Executive Subcommittee shall be responsible for the timely processing of unresolved comments. Unless a consensus for revision is established, the requirements of the current edition shall carry over to the proposed edition. Those items on which consensus cannot be reached shall be considered by the appropriate cognizant technical subcommittee during the next revision cycle.

6.2 All ballots with unresolved negative comments shall be recirculated for 10 days to the Main Committee. The verbatim text of each comment, the name of the negative voter, and a rebuttal shall be included in the recirculation ballot package. During a recirculation ballot, committee members shall have an opportunity to respond, reaffirm or change their previously cast votes.

6.3 In connection with an objection articulated during a public comment period, or submitted with a vote, each such objector shall be informed in writing that an appeals process exists within these procedures.

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Committee Membership

Main Committee

Nelson G. Bingel, III, *Chair* **Danna J. Liebhaber,** *Vice Chair*

Organization represented	Voting position	Name	Employed by
Chair	Principal	Nelson G. Bingel III	Nelson Research, LLC
Past Chair	Principal	Michael J. Hyland	American Public Power Association
AAR	Principal	Robert Verhelle	HTNB Corporation
AEIC	Principal	Swapan Dey	Eversource Energy
APPA	Principal	Alex Hofmann	American Public Power Association
APPA	Alternate	Nathan Mitchell	American Public Power Association
APTA	Principal	Narayana Sundarum	American Public Transit Association
APTA	Alternate	Nathan Leventon	American Public Transit Association
ATIS	Principal	Lawrence M. Slavin	Outside Plant Consulting Services, Inc.
ATIS	Alternate	Trevor Bowmer	Bunya Consulting
BPA	Principal	Danna J. Liebhaber	Bonneville Power Administration
EEI	Principal	Eric K. Engdahl	American Electric Power
EEI	Alternate	Lauren E. Gaunt	Eversource Energy
IBEW	Principal	George Arhos	International Brotherhood of Electrical Workers
IBEW	Alternate	David Mullen	International Brotherhood of Electrical Workers
IEEE/PES	Principal	Otto Lynch	Power Line Systems, Inc.
IEEE/IAS	Alternate	Charles Ward	TechServ Consulting & Training, Inc.
IEC	Principal	David Hittinger	Independent Electrical Contractors of Greater Cincinnati
IEC	Alternate	Jason Todd	Independent Electrical Contractors
IMSA	Principal	Jeffrey Knight	International Municipal Signal Association
NARUC	Principal	Mark Rettmann	Oregon Public Utility Commission
NECA	Principal	Stephen Poholski	Newkirk Electric, Retired
NECA	Alternate	Michael J. Johnston	National Electrical Contractors Association
NEMA	Principal	Paul Orr	National Electrical Manufacturers Association
NRECA	Principal	Robert Harris	National Rural Electric Cooperative Association
NSC	Vacant		
NSPE	Principal	Robert S. Fuller	Texas-New Mexico Power Co.
SCTE	Principal	Timothy Cooke	Amphenol Broadband Solutions
SEIA	Principal	Lee Kraemer	First Solar
SEIA	Alternate	Greg Ball	Tesla
TVA	Principal	Clayton L. Clem	Tennessee Valley Authority
TVA	Alternate	Stephen Cantrell	Tennessee Valley Authority
WAPA	Principal	Ross Clark	U.S. Department of Energy, Western Area Power Administration
USDA/RUS	Principal	Gerald Moore	USDA/Rural Utilities Service

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Subcommittee 1
Purpose, Scope, Application, Definitions, and References
(Sections 1, 2, and 3)

Samuel Stonerock, *Chair* **Mickey B. Gunter,** *Secretary*

Name	Voting position	Employed by	Organization represented
Keith Reese	Principal	Georgia Power Company	Interpretations SC
Nelson G. Bingel III	Principal	Nelson Research	NESC Main
Danna J. Liebhaber	Alternate	Bonneville Power Administration	NESC Main
Samuel Stonerock	Principal	Southern California Edison	SC1
Mickey B. Gunter	Alternate	Georgia Power, Consultant	SC1
Robert Molde	Principal	Xcel Energy	SC2
Ronald J. Wellman	Alternate	American Electric Power	SC2
James E. Houston	Principal	Southern Company Services	SC3
Gregory Wolven	Alternate	WIN Energy REMC	SC3
Eric K. Engdahl	Principal	American Electric Power, Consultant	SC4
Mickey B. Gunter	Alternate	Georgia Power, Consultant	SC4
Joseph Rempe	Principal	Tacoma Power	SC5
Bruce Freimark	Alternate	American Electric Power	SC5
Lauren E. Gaunt	Principal	Eversource Energy	SC7
William Ashley Eanes	Alternate	Duke Energy	SC7
Samuel Stonerock	Principal	Southern California Edison	SC8
Brent McKinney	Alternate	City Utilities of Springfield	SC8

Subcommittee 2
Grounding Methods
(Section 9)

Robert Molde, *Chair* **Ronald J. Wellman,** *Secretary*

Name	Voting position	Employed by	Organization represented
James McGowan	Principal	Quanta Services, Inc.	CEC
Donald Zipse	Principal	Electrical Forensics, LLC	CEC
Trevor Bowmer	Principal	Bunya Consulting	CPR
Ernest Gallo	Alternate	Ericsson	CPR
Timothy Cooke	Principal	Amphenol Broadband Solutions	CPR
George Arhos	Principal	IBEW	ECL
David Mullen	Alternate	IBEW	ECL
Robert Molde	Principal	Xcel Energy	EPR
Ronald J. Wellman	Principal	American Electric Power	EPR
Lauren E. Gaunt	Principal	Eversource Energy	EPR
Michael Renman	Alternate	Xcel Energy	EPR
Steven Burlison	Alternate	Duke Energy	EPR

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Name	Voting position	Employed by	Organization represented
Keith Reese	Principal	Georgia Power	EPR
John Bruce	Alternate	Dominion Energy Company	EPR
Bob Dew	Principal	Hi-Line Engineering	EPU
Thomas Gwinn	Alternate	National Rural Electric Cooperative Association	EPU
Robert Harris	Alternate	National Rural Electric Cooperative Association	EPU
Lee Herron	Principal	Burndy LLC	GEN/M
David Hansen	Principal	Public Service Commission of Wisconsin	GOV
Jim Lepinski	Alternate	Public Service Commission of Wisconsin	GOV
Trung Hiu	Principal	USDA/Rural Utilities Service	GOV
Donald Junta	Alternate	USDA/Rural Utilities Service	GOV

Subcommittee 3
Electric Supply Stations
(Sections 10–19)

James E. Houston, *Chair* **Gregory A. Wolven,** *Secretary*

Name	Voting position	Employed by	Organization represented
Andy Kunze	Principal	Enbridge	CEC
John Aultman	Alternate	Saginaw Power & Automation	CEC
Drew Szabo	Principal	Westwood PS	CEC
George Arhos	Principal	IBEW	ECL
David Mullen	Alternate	IBEW	ECL
W. Bruce Dietzman	Principal	Oncor Electric Delivery Company	EPR
David Guzman	Alternate	El Paso Electric Company	EPR
James E. Houston	Principal	Southern Company Services	EPR
William Munn	Alternate	Southern Company Services	EPR
Mark A. Konz	Principal	Gulf Power Company	EPR
K. Shawn Robinson	Principal	American Electric Power	EPR
Kenneth Posey	Alternate	American Electric Power	EPR
Christopher A. Carson	Alternate	Alabama Power Company	EPR
Timothy Jyrkas	Alternate	Xcel Energy	EPR
Lee Kraemer	Principal	First Solar	EPR
Gregory A. Wolven	Principal	WIN Energy REMC	EPU
Thomas Gwinn	Alternate	National Rural Electric Coop. Assn.	EPU
Greg Ball	Alternate	Tesla	GEN/M
William Pollak	Principal	NJ Transit	GEN/OU
Mehrdad Eskandary	Principal	USDA/Rural Utilities Service	GOV
Dustin Metz	Principal	North Carolina Utility Commission	GOV

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Subcommittee 4
Overhead Lines—Clearances
(Sections 20, 21, 22, and 23)

Eric K. Engdahl, *Chair* **Mickey B. Gunter,** *Secretary*

Name	Voting position	Employed by	Organization represented
Marc Candels	Principal	Candels Consulting	CEC
Jesse Kohler	Principal	Power Line Systems, Inc.	CEC
Troy Little	Principal	Brooks, Jackson & Little, Inc.	CEC
David J. Marne	Principal	Marne & Associates, Inc.	CEC
Douglas Proctor	Principal	Proctor Engineering Services	CEC
Jason Hoskins	Alternate	Ulteig	CEC
Trevor Bowmer	Principal	Bunya Consulting	CPR
Lawrence M. Slavin	Principal	Outside Plant Consulting Services. Inc.	CPR
Ernest Gallo	Alternate	Ericsson	CPR
Richard Meeker	Principal	Crown Castle	CPR
Eric O'Brien	Alternate	Crown Castle	CPR
George Arhos	Principal	IBEW	ECL
David Mullen	Alternate	IBEW	ECL
Eric K. Engdahl	Principal	American Electric Power	EPR
Mickey B. Gunter	Principal	Georgia Power, Consultant	EPR
Alan Kuipers	Principal	Consumer Energy	EPR
Keith Reese	Principal	Georgia Power	EPR
Barrett Thomas	Principal	American Electric Power	EPR
Jeffrey Steiner	Principal	National Grid	EPR
David Young	Alternate	Florida Power & Light	EPR
Blake Tucker	Alternate	American Electric Power	EPR
David D'Hooge	Alternate	Commonwealth Edison Company	EPR
Joseph J. White	Principal	Baltimore Gas & Electric	EPR
Donnie Trivitt	Alternate	OG&E Electric Services	EPR
David Barnard	Alternate	Baltimore Gas & Electric	EPR
Branch Davis	Alternate	Entergy Corporation	EPR
Michael Dyer	Principal	Salt River Project	EPU
Terry Rosenthal	Principal	Laclede Electric Cooperative	EPU
Robert Harris	Alternate	National Rural Electric Coop. Assn.	EPU
Ernest H. Neubauer	Alternate	Southern Rivers Energy, retired	EPU
Jason Jenks	Principal	Intermountain Rural Electric Assn.	EPU
Danna Liebhaber	Principal	Bonneville Power Administration	EPU
Michael Stolz	Alternate	Bonneville Power Administration	EPU
Joanna Pardini	Principal	Amtrak	GEN/OU
Robert Verrelle	Alternate	Amtrak	GEN/OU
Robert Kluge	Principal		GEN

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Akanksha Craft	Principal	Public Service Commission of Wisconsin	GOV
Darren Gill	Principal	Pennsylvania Public Utility Commission	GOV
Donald Junta	Principal	USDA/Rural Utilities Service	GOV
Jim Lepinski	Alternate	Public Service Commission of Wisconsin	GOV
Norris Nicholson	Alternate	USDA/Rural Utilities Service	GOV
Mark Rettmann	Principal	Oregon Public Utilities Commission	GOV

Subcommittee 5
Overhead Lines—Strength and Loading
(Sections 24, 25, and 27)

Joseph Rempe, *Chair* **Bruce Freimark,** *Secretary*

Name	Voting position	Employed by	Organization represented
Otto Lynch	Principal	Power Line Systems Inc.	CEC
Brandon Grillon	Alternate	Power Line Systems. Inc.	CEC
Wesley J. Oliphant	Principal	Exo Inc.	CEC
Mark Messenger	Principal	Osmose Utilities Service	CEC
Brenda Sears	Principal	TRC Solutions	CEC
Kurt Traub	Principal	Ampirical	CEC
Derrik Slayman	Alternate	Ampirical	CEC
Trevor Bowmer	Principal	Bunya Consulting	CPR
Lawrence M. Slavin	Principal	Outside Plant Consulting Services. Inc.	CPR
Timothy Cooke	Principal	Amphenol Broadband Solutions	CPR
G. Paul Anundson	Principal	National Grid	EPR
Ronald Cotant	Principal	American Electric Power	EPR
Bruce Freimark	Principal	American Electric Power	EPR
C. Jerry Wong	Principal	Florida Power & Light	EPR
Edward Harrel	Principal	Oncor Electric Delivery Company	EPR
Jeffrey Erdle	Principal	Duke Energy	EPR
John-Chung Ng	Principal	American Electric Power	EPR
Prasad Yenumula	Alternate	Duke Power Company	EPR
Jessica Farrell	Alternate	National Grid	EPR
Matthew Shellenberger	Alternate	American Electric Power	EPR
Aaron Darby	Alternate	American Electric Power	EPR
Rusty Soderberg	Principal	Consumers Energy	EPR
James Dubay	Alternate	Consumers Energy	EPR
Robert Fuller	Principal	Texas-New Mexico Power Company	EPR
Michael Garrels	Principal	Xcel Energy	EPR

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Name	Voting position	Employed by	Organization represented
Frank Agnew	Principal	Alabama Power Company	EPR
Wade Shultz	Principal	Alabama Power Company	EPR
John Trentham	Alternate	Alabama Power Company	EPR
David West	Alternate	Duke Power Company	EPR
Melanie Bragdon	Alternate	Florida Power & Light	EPR
Warren Brooks	Principal	City Utilities of Springfield	EPU
Joseph Rempe	Principal	Tacoma Power	EPU
Thomas Haire	Principal	Rutherford EMC	EPU
Robert Harris	Principal	National Rural Electric Cooperative Association	EPU
Kevin Mara	Alternate	GDS Associates	EPU
Grand Glaus	Alternate	Columbia River Electric Association	EPU
Will Pittman	Principal	Carteret-Craven Electric Cooperative	EPU
Clayton L. Clem	Principal	Tennessee Valley Authority	EPU
Stephen Cantrell	Alternate	Tennessee Valley Authority	EPU
Leon Kempner	Principal	Bonneville Power Administration	EPU
Mark Nelson	Alternate	Bonneville Power Administration	EPU
Mark Jurgemeyer	Principal	Intermountain Rural Electric Association	EPU
Cody Neyens	Principal	Western Area Power Administration	EPU
John Busel	Principal	American Composites Manufacturers Association	GEN/M
Scott Holmes	Alternate	Highland Composites	GEN/M
Dustin Troutman	Alternate	Creative Pultrusions, Inc.	GEN/M
Helen Chen	Principal	American Iron and Steel Institute	GEN/M
William Reisdorff	Alternate	Valmont Utility	GEN/M
Jim Fixsen	Principal	Bell Lumber and Pole	GEN/M
Bob Reisdorff	Alternate	Laminated Wood Systems Inc.	GEN/M
Martin Rollins	Principal	H.M. Rollins Company, Inc.	GEN/M
Andrew Schwalm	Principal	Victor Insulators, Inc.	GEN/M
Robert Kluge	Alternate		GEN
Arthur Graham	Principal	Florida Public Service Commission	GOV
Ryan Laruwe	Principal	Michigan Public Service Commission	GOV
Chendi Zhang	Principal	USDA/Rural Utilities Service	GOV
Norris Nicholson	Alternate	USDA/Rural Utilities Service	GOV

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Subcommittee 7
Underground Lines
(Sections 30–39)

Lauren E. Gaunt, *Chair* **William Ashley Eanes,** *Secretary*

Name	Voting position	Employed by	Organization represented
David J. Marne	Principal	Marne & Associates, Inc.	CEC
Trevor Bowmer	Principal	Bunya Consulting	CPR
Lawrence M. Slavin	Principal	Outside Plant Consulting Services, Inc.	CPR
Timothy Cooke	Principal	Amphenol Broadband Services	CPR
George Arhos	Principal	IBEW	ECL
David Mullen	Alternate	IBEW	ECL
Lauren E. Gaunt	Principal	Eversource Energy	EPR
Jonathan Gonynor	Principal	National Grid	EPR
Mickey B. Gunter	Principal	Georgia Power, Consultant	EPR
William Ashley Eanes	Principal	Duke Energy	EPR
William McCorcle	Alternate	American Electric Power	EPR
Michael Renman	Alternate	Xcel Energy	EPR
Lee Welch	Principal	Southern Company	EPR
Keith Reese	Alternate	Georgia Power Company	EPR
Michael Dyer	Principal	Salt River Project	EPU
Kevin Ogles	Principal	Middle Tennessee Electric Membership Corporation	EPU
Thomas Gwinn	Alternate	National Rural Electric Cooperative Association	EPU
Narayana Sundaram	Principal	American Public Transit Association	GEN/OU
Nathan Leventon	Alternate	American Public Transit Association	GEN/OU
Akanksha Craft	Principal	Public Service Commission of Wisconsin	GOV
Jim Lepinski	Alternate	Public Service Commission of Wisconsin	GOV
Trung Hiu	Principal	USDA/Rural Utilities Service	GOV
Donald Junta	Alternate	USDA/Rural Utilities Service	GOV

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Subcommittee 8
Work Rules
(Sections 40–44)

Samuel Stonerock, *Chair* **Brent McKinney,** *Secretary*

Name	Voting position	Employed by	Organization represented
F. M. Brooks	Alternate	Brooks, Jackson & Little, Inc.	CEC
David Hittinger	Principal	Independent Electrical Contractors	CEC
Charles W. Gross	Principal	Consultant	CEC
Troy Little	Principal	Brooks, Jackson & Little, Inc.	CEC
Ronald May	Alternate	Brooks, Jackson & Little, Inc.	CEC
James McGowan	Principal	Quanta Services, Inc.	CEC
Stephen Poholski	Principal	Newkirk Electric, retired	CEC
Thomas Verdecchio	Principal	ESCI	CEC
David Wallis	Principal	DMW Safety Consulting	CEC
Trevor Bowmer	Principal	Bunya Consulting	CPR
Ernest Gallo	Alternate	Ericsson	CPR
George Arhos	Principal	IBEW	ECL
David Mullen	Alternate	IBEW	ECL
Bill McGough	Principal	Alabama Power Company	EPR
Bernie D. (Donnie) Bell	Alternate	Gulf Power Company	EPR
Stephen Barnard	Principal	Dominion Virginia Power	EPR
Malcolm Smoak	Principal	Southwestern Electric Power Company	EPR
Samuel Stonerock	Principal	Southern California Edison	EPR
Michael Granata	Principal	Appalachian Power Company	EPR
William Beutler	Alternate	First Energy Corporation	EPR
Mark Green	Alternate	PECO Energy Company	EPR
Dennis Hoffman	Alternate	American Electric Power	EPR
Thuy Nguyen	Alternate	American Electric Power	EPR
David Robinson	Alternate	American Electric Power	EPR
Corey Zeigler	Principal	Duke Energy	EPR
Todd Revell	Alternate	Dominion Energy	EPR
Steven Theis	Principal	Public Service Electric & Gas Co.	EPR
Brent McKinney	Principal	City Utilities of Springfield	EPU
Jonathan Beasley	Principal	MEAG Power/Electric Cities of Georgia	EPU
Kevin Dody	Alternate	City Utilities of Springfield	EPU
JD Cox	Principal	Northcentral Electric Power Association	EPU
Thomas Gwinn	Alternate	National Rural Electric Coop. Assn.	EPU
Robert Harris	Alternate	National Rural Electric Coop. Assn.	EPU
Brian Erga	Principal	ESCI Inc.	EPU
Edward Hunt	Principal	Western Area Power Administration	EPU

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Name	Voting position	Employed by	Organization represented
Gary Zevenberger	Alternate	Western Area Power Administration	EPU
Jim Lepinski	Alternate	Public Service Commission of Wisconsin	GOV
Mohammed Monawer	Principal	Public Service Commission of Wisconsin	GOV
Norris Nicholson	Principal	USDA/Rural Utilities Service	GOV

Organizations represented

AAR—Association of American Railroads
AEIC—Association of Edison Illuminating Companies
APPA—American Public Power Association
APTA—American Public Transit Association
ATIS—Alliance for Telephone Industry Solutions
AWPA—American Wood Preservers Association
BPA—Bonneville Power Admin., US Dept. of Energy
EEI—Edison Electric Institute
IBEW—International Brotherhood of Electrical Workers
IEC—Independent Electrical Contractors
IEEE—Institute of Electrical and Electronics Engineers, Inc.
IMSA—International Municipal Signal Association
NARUC—National Association of Regulatory Utility Commissioners
NECA—National Electrical Contractors Association
NEMA—National Electrical Manufacturers Association
NRECA—National Rural Electric Cooperative Association
NSC—National Safety Council
NSPE—National Society of Professional Engineers
RUS—Rural Utilities Services, US Dept. of Agriculture
SCTE—Society of Telecommunication Engineers
TVA—Tennessee Valley Authority
WAPA—Western Area Power Administration, US Dept. of Energy

Classifications for NESC Technical Subcommittees

CEC—Consulting, Engineering, and Construction
CPR—Communications Private Sector
CPU—Communications Public Sector
ECL—Electric and Communication Labor
EM—Emeritus
EPR—Electric Private Sector
EPU—Electric Public Sector
GENERAL:
- GEN/I—General/Insurance
- GEN/IEO—General/Independent Electric Operators
- GEN/M—General/Manufacturers
- GEN/OU—General/Other Utilities

GOV—Government
O—Observers

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NESC Rules

Group 1. General

Section 1. Introduction to the National Electrical Safety Code

Deleted Text
CP5075
Section: 1 Rule: 010 A, B

Submitter
Mark Gray

Proposed Change
Revise Rules 010A and 010B by deleting "utility facilities" as follows:

010. Purpose

A. The purpose of the NESC is the practical safeguarding of persons ~~and utility facilities~~ during the installation, operation, and maintenance of electric supply and communication facilities, under specified conditions.

...

B. NESC rules contain the basic provisions, under specified conditions, that are considered necessary for the safeguarding of:

1. The public,

2. Utility workers (employees and contractors), and

~~3. Utility facilities.~~

Supporting Comment
This Code has always been about the safeguarding of persons. In fact if you look at the purpose statement of Section 9, Parts 1, 2, 3, and 4, it clearly says safeguarding of only persons, not utility facilities, so this deletion will at least bring consistency. In the 2017 Code "affected property" was removed because it was ambiguous, not understood, or defined, and "utility facilities" needs to be removed for similar reasons. The language "utility facilities," along with several definitions such as "utility" was added during the 2012 Code in support of ongoing "negotiations" to harmonize the NESC and NEC. At the that time, it was stated in the NESC supporting statement that "Similar proposals will be made for change in the NEC after consideration of this and related proposals by the NESC this fall." The NEC has never made and/or incorporated similar proposals for their code and thus, the NESC is best served by returning to its original purpose.

Subcommittee 1 Recommendation
Accept in principle.

Subcommittee 1 Comment
See action taken on CP5357.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson

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Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Revised Text
CP5357
Section: 1 Rule: 010 B

Submitter
Scott Smith

Proposed Change
010. Purpose

A. The purpose of the NESC is the practical safeguarding of persons ~~and utility facilities~~ during the installation, operation, and maintenance of electric supply and communication facilities, under specified conditions.

NOTE: NESC rules are globally recognized and intended to provide a practical standard of safe practices that can be adopted by public utilities, private utilities, state or local utility commissions or public service commissions, or other boards or bodies having control over safe practices employed in the design, installation, operation, and maintenance of electric supply, communication, street and area lighting, signal, or railroad utility facilities.

B. NESC rules contain the basic provisions, under specified conditions, that are considered necessary for the safeguarding of~~:~~ the public and utility workers (employees and contractors).

~~1. The public,~~

~~2. Utility workers (employees and contractors),~~

~~3. Utility facilities.~~

C. This Code is not intended as a design specification or as an instruction manual.

Supporting Comment
The wording of this rule was revised in 2012 to expand the stated purpose of the NESC to include safeguarding of inanimate property (utility facilities and affected property) in addition to safeguarding of persons. The change greatly expanded the application of the rules. In the 2017 Edition "affected property" was removed because of confusion as to what exactly was meant by the term, but "utility facilities" remained. The 2017 action is an improvement, but the focus of the NESC is still diluted. By including safeguarding of "utility facilities" with safeguarding of persons, the revised rule still effectively equates safety of things to safety of persons. This is a significant departure from the historical philosophy of the Code.

In supporting this revision in the 2012 revision cycle, the subcommittee's supporting statement suggested that the requirement for safeguarding things already existed. The Southeastern Electric Exchange disagrees. Where rules have historically included requirements for facilities or inanimate system components, the intent has always been to establish safe conditions for persons relative to those objects—not solely for concern for harm or damage to the facilities themselves. The revised wording can be interpreted to mean the NESC is addressing conditions of facilities independent of safety considerations for persons. With this wording, if a structure or other system component is damaged or a piece of equipment fails, with no harm or exposure to persons, the burden can be placed on the owner or operator to show that this is not a violation of the Code. It might be argued that the requirement is justified from a reliability perspective, but damage to, or failure of a "thing" regardless of the reason, should not be equated to harm or injury to persons. In addition the supporting statements used to justify adding this language in the 2012 Code indicated that the NEC would make similar

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changes for "harmonizing the NESC and the NEC." To my knowledge, the NEC has never made similar changes.

Subcommittee 1 Recommendation
Accept.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

---

New Text
CP5493
Section: 1 Rule: 010 B3

Submitter
Mike Anthony

Proposed Change
Underneath 010B3 add the following:

4. Employees and contractors engaged in the operation and maintenance of multi-building, campus-style industrial and commercial power systems on the load side of the utility service point but not within building premises.

Supporting Comment
Admittedly, it is difficult to craft economical language to describe the medium- and high-voltage power systems—often in the 10 to 250 MVA range—that are utility-like in their scale and imperfectly covered in the NFPA 70, NFPA 70E, and NFPA 70B because the sensibilities embedded in those documents are informed largely from the perspective of building premises fire safety professionals. There are hundreds of campuses' power grids in the education industry that should be informed by the safety practices of *both* the IEEE electrical engineering "culture" and the NFPA fire safety "culture."

For example, the grounding, clearances, overhead and underground coordination practices. protective arrangements, and lighting systems should be identically "utility-like" in their application. As these campus power systems grow, are bought and sold like utility systems,* develop more complex interactive characteristics and become under more political pressure to be regulated, IEEE must be the first name in leading practice discovery and promulgation.

I had the privilege of collaborating with John Troglia and Neil LaBrake (both presenting EEI) and Kenneth Boyce (UL) in the early 2000s on service point concepts in the NEC so I am familiar with the subtlety and the complexity of the issue. As this proposal will correlate with other proposals similar in concept, I am happy to participate in any working groups.

* The entire 200-odd MVA Ohio State University power system is being leased for $1 billion to a private O&M organization, to name one example (https://www.cleveland.com/metro/index.ssf/2017/04/ohio_state_university_to_lease.html).

There will be others. We should err on the side of overlap between the NEC and NESC in order to keep them safe.

Note that I am affiliated with IEEE SCC-18, IEEE Education & Healthcare Facilities Committee, and National Electrical Code Panels 1 and 15, but this proposal is submitted as a codes and standards advocate for StandardsMichigan.COM; an organization focused on user-interest safety and sustainability codes and

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standards for the education industry.

Subcommittee 1 Recommendation
Reject.

Subcommittee 1 Comment
See action taken on CP5357.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

---

Revised Text
CP5484
Section: 1 Rule: 010 C

Submitter
Joseph Godwin

Proposed Change
010. Purpose

C. This Code is not intended as a design specification or as an instruction manual. This Code is intended to be used as a minimum electrical safety guideline and to provide guidance for engineering an electric system with safety in mind for the practical safeguarding of persons and the public, relative to the anticipated environmental and operational loading on that system.

Supporting Comment
I agree, "…This Code is not intended as a design specification or as an instruction manual…" however there are several occasions where the Code provides minimum values for clearance, overload factors, and grades of construction, which are all design parameters. The additional text is offering to state that the Code is instead to be the guidelines for safety and promoting the mindset of safety to the engineering and construction of the components and to the practical safeguarding of persons and the public.

Subcommittee 1 Recommendation
Reject.

Subcommittee 1 Comment
The proposed verbiage is in direct conflict with existing Rule 010C. See action taken on CP5049.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

---

New Text
CP5491
Section: 1 Rule: 010 C

Submitter
Mike Anthony

Proposed Change
C. This Code is not intended as a design specification or as an instruction manual.

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NOTE: This Code contains provisions that are considered necessary for safety. Compliance therewith and proper maintenance result in an installation that is essentially free from hazard but not necessarily efficient, convenient, or adequate for good service for future expansion of electrical use.

Supporting Comment

This is language lifted directly from Section 90.1 of the National Electrical Code and is recommended to strengthen the NESC by recognizing that many of its provisions *actually are* design specifications and that the NESC *actually is* used as an instruction manual.

This proposal is informed by my experience on CMP-1 of the NEC since 1993. The claim that the NESC is "not a design manual" recalls long-standing discussions among the friends of the NEC whether the NEC can claim *not* to be a design manual given that much of NEC Chapter 2 sets the broad contours for electrical system design to promote fire safety. In a similar way, the clearance, coordination, grounding specifics in the NESC, to name a few, actually do set the broad contours of electrical safety design for much of the power chain in "other than premise wiring."

At the very least this proposal can contribute to the understanding of *maintenance* as an essential condition for electrical safety at any voltage on either side of the service point. Lack of appropriate maintenance is the dominant factor in power outages that, at the traditional utility level, affect thousands of lives when power is not present.

Note that I am affiliated with IEEE SCC-18, IEEE Education & Healthcare Facilities Committee and National Electrical Code Panels 1 and 15 but this proposal is submitted as a codes and standards advocate for StandardsMichigan.COM; an organization focused on user-interest safety and sustainability codes and standards for the education industry.

Subcommittee 1 Recommendation

Reject.

Subcommittee 1 Comment

The Note itself is misleading, and is in conflict with Rule 010C. See action taken on CP5049.

Vote on Subcommittee 1 Recommendation

Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Revised Text

CP5479

Section: 1 Rule: 010 C

Submitter

Otto Lynch

Proposed Change

C. This Code is not intended as neither a design specification ~~or~~ nor as an instruction manual.

Supporting Comment

Grammatical correction. either/or vs. neither/nor. Since neither are intended, it must be nor.

Subcommittee 1 Recommendation

Accept in principle.

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Subcommittee 1 Comment
See action taken on CP5049.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Revised Text
CP5049
Section: 1 Rule: 010 C

Submitter
Mickey B. Gunter

Proposed Change
Revise Rule 010C as follows:

C. This Code is not intended as a design specification or as an instruction manual, nor is it intended to provide design criteria for abnormal events, such as but not limited to, actions of others or weather events in excess of those described herein.

Supporting Comment
This proposed CP language does not use the "R" words, but still accomplishes the same intent without introducing new terms that would require definitions. The NESC language needs to focus on what the NESC is about, not what it is not about.

Subcommittee 1 Recommendation
Accept as modified.

C. This Code is not intended as a design specification, ~~or as~~ an instruction manual, ~~nor~~ or ~~is it intended~~ to provide ~~design~~ criteria for abnormal events such as, but not limited to, actions of others or weather events in excess of those described herein.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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New Text
CP5480
Section: 1 Rule: 010 D

Submitter
Otto Lynch

Proposed Change

D. This Code is not intended to provide neither reliable facilities nor resilient facilities.

Supporting Comment
The NESC currently does not adequately address neither reliability nor resiliency; as Rule 010A correctly states; "The purpose of the NESC is the practical safeguarding of persons and utility facilities during the installation, operation, and maintenance of electric supply and communication facilities, under specified conditions." The *specified conditions* listed in Section 24, 25, 26, and 27 do not adequately address neither

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reliability nor resiliency. These issues are becoming more and more important topics to the public as well as many governmental and other jurisdictional entities who desire to have more reliable electric service, and a more resilient system in the event of failures.

Unless significant changes are made in the 2022 cycle that address grade of construction, weather events, strength factors, and load factors in the subject sections listed above, the Code must be very clear to the public and to government and jurisdictional entities that require the use of the NESC only that engineering an overhead line facility only to the minimum requirements of the subject sections does *not* provide either reliable facilities or resilient facilities. Unless reliability and resiliency are addressed in the 2022 cycle, the NESC should not portend to be something that it is not. This additional rule will clarify these issues.

Subcommittee 1 Recommendation
Reject.

Subcommittee 1 Comment
The addition of Rule 010D is unnecessary and does not improve the code. See action taken on CP5049.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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New Text
CP5103
Section: 1 Rule: 010 B, C, D

Submitter
Lawrence Slavin

Proposed Change
010. Purpose

A. The purpose of the NESC is the practical safeguarding of persons and utility facilities during the installation, operation, and maintenance of electric supply and communication facilities, under specified conditions.

NOTE: NESC rules are globally recognized and intended to provide a practical standard of safe practices that can be adopted by public utilities, private utilities, state or local utility commissions or public service commissions, or other boards or bodies having control over safe practices employed in the design, installation, operation, and maintenance of electric supply, communication, street and area lighting, signal, or railroad utility facilities.

B. NESC rules contain the basic provisions, under specified conditions, that are considered necessary for the safeguarding of:

1. The public,

2. Utility workers (employees and contractors), and

3. Utility facilities to the extent they may affect the safety of the public and utility workers.

C. This Code is not intended as a design specification or as an instruction manual. However, the electrical and structural safety criteria contained herein may be used as baseline parameters in design and engineering calculations for the network.

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D. Although issues such as reliability and resiliency are not directly addressed in the NESC, the electrical and structural safety criteria provide a foundational level of structural robustness that, in turn, makes a positive contribution to overall system reliability and resiliency.

*NOTE: "*Reliability" is a measure of the downtime, based on the failure rate of network components, of the supply or communication facilities under normal operational and expected adverse conditions. A reliable network has a low failure rate of components and a low percentage of service downtime. "Resilience" corresponds to the ability to rapidly restore service following a low probability adverse condition; high resilience implies a low component failure rate coupled with the ability to rapidly restore service following the associated outages.

Supporting Comment

While the NESC is widely used and respected within the United States (and elsewhere) as a credible source of basic safety requirements for the electric supply and communication industries, its breadth and focus is sometimes not so well understood. There is therefore a need to provide additional details and emphasis in Rule 010.

Rule 010A states that the purpose of the NESC is the "safeguarding of persons *and utility facilities* during the installation, operation, and maintenance of electric supply and communication facilities." However, regarding utility facilities, as a safety code, the intention should be to protect such items only as it may otherwise endanger persons. The addition to Rule 010B3 adds such clarification.

Rule 010 is also intended to distinguish the purpose of the NESC from that of minimizing downtime such as may result from component failure during relatively "normal"—or possibly somewhat adverse—operating conditions. It is recognized that the temporary loss of supply or communications service is indeed an important—potentially safety—issue, but directly addressing such issues is outside the present intent of the NESC. Rather, this important characteristic, or system "reliability," is typically addressed within each utility by its internal product and design specifications coupled with quality assurance and test/inspection programs.

A related, but somewhat different, matter is the ability to rapidly recover from the effects of severe events or hazards (floods, earthquakes, tornadoes, terrorism, …). Such recovery programs are based on the advance planning, including procedures and equipment, that has been effectively employed by the utilities following major natural disasters. Again, directly addressing such "resiliency" is outside the present intent of the NESC. Reliability and resilience requirements must consider various factors, including regulatory, engineering and business issues.

Nonetheless, adherence to the basic provisions provided in the various parts of the NESC (e.g., Section 09, and Parts 1, 2, and 3), which include construction related requirements, help ensure a degree of robustness that will favorably impact the reliability of the utility lines. For example, adherence to minimum clearance requirements between supply conductors will reduce the likelihood of mutual contact, otherwise resulting in a possible outage. Similarly, the uniformity of work rules and practices, as provided in Part 4 of the NESC, enable work crews from different companies and geographic areas to work in an efficient cooperative manner with those of the impacted area to rapidly restore service, enhancing network resiliency. This ability has been demonstrated following major hurricanes, such as Katrina and Sandy.

Present Rule 010C explicitly states that the NESC is not a design specification. This statement does not, however, exclude various rules and requirements that may be interpreted as design *criteria*, and are often used by the utilities to provide baseline design criteria to include in network engineering calculations, as well as a degree of basic robustness as described above. In general, specific engineering and design details for the physical network are provided outside of the NESC, for which various references are provided (e.g., Rule 260B1). In a similar vein, this proposed new Rule 010D attempts to clarify the purpose of the NESC with regard to network reliability and resilience.

In general, it would not be judicious to attempt to extend the NESC to incorporate detailed design rules—or

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provisions for reliability or resilience—since this may dilute the main objective of "safeguarding of persons and utility facilities during the installation, operation, and maintenance of electric supply and communication facilities," which has so successfully been achieved during the past century. For this reason, it is recommended that the IEEE develop a separate document that does in fact address the subject of resiliency for supply and communication utilities. In particular, the following document may be considered as an important guide: *Community Resilience Planning Guide for Buildings and Infrastructure Systems*, NIST Special Publication 1190, October 2015. Other potentially useful documents include:

The Definition and Quantification of Resilience, IEEE PES Industry Technical Support Task Force, Technical Report PES-TR65, April 2018.

Earthquake Risk Study for Oregon's Critical Energy Infrastructure Hub, Open-File Report O-13-09, State of Oregon, 2013.

Hardening and Resiliency, U.S. Energy Industry Response to Recent Hurricane Seasons, Infrastructure Security and Energy Restoration, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, August 2010.

Lifelines: Upgrading Infrastructure to Enhance San Francisco's Earthquake Resilience, SPUR Report, February 2009.

Telecommunications and Electric Power, Interdependency Task Force (TEPITF), People and Processes: Current State of Telecommunications and Electric Power Interdependencies, The President's National Security Telecommunications Advisory Committee, January 31, 2006.

Subcommittee 1 Recommendation

Reject.

Subcommittee 1 Comment

The NESC subcommittee members and Subcommittee 1 are not convinced that the purpose of the NESC needs to be modified to include additional information regarding reliability and resilience.

Vote on Subcommittee 1 Recommendation

Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Revised Text

CP5372

Part: 1 Section: 1 Rule: 011 A3

Submitter

Lee Kraemer

Proposed Change

3. Utility facilities and functions of utilities that (a) either generate energy by conversion from some other form of energy such as, but not limited to, fossil fuel, chemical, <u>electrochemical,</u> nuclear, solar, mechanical, wind, or hydraulic or communication signals or accept energy or communication signals from another entity and (b) provide that energy or communication signals through a delivery point to another entity.

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Supporting Comment
Electrochemical battery energy storage is playing an increasing role in utility resource planning, partly in response to the growth of the renewable energy industry. As this is anticipated to be a sustained trend, it follows that "electrochemical" should be added to the list of example energy forms.

Due to an omission, Subcommittee 1 did not review CP5372 in 2018, but will provide a final review and recommendation for this CP in 2020.

Subcommittee 3 Recommendation
Accept.

Vote on Subcommittee 3 Recommendation
Affirmative: (11) George Arhos, W. Bruce Dietzman, James Houston, Mark A. Konz, Lee Kraemer, Andy Kunze, Dustin Metz, William Pollak, K. Shawn Robinson, Drew Szabo, Gregory Wolven
Absent/No Return: (1) Mehrdad Eskandary

Revised Text
CP5056
Section: 1 Rule: 011 A5

Submitter
Mickey B. Gunter

Proposed Change
Revise Rule 011A5 as follows:

5. Utility facilities and functions on the line side of the service point supplied by underground or overhead conductors <u>maintained and/or</u> installed ~~and/or maintained~~ under exclusive control of utilities located on public or private property in accordance with legally established easements or rights-of-way, contracts, other agreements (written or by conditions of service), or as authorized by a regulating or controlling body.

Supporting Comment
Similar language was incorporated in Rule 011A4 in the 2017 Code with "maintained" shown before "installed" and should be reversed here similarly. This language was used to cover those situations where the customer installed the facilities under the NEC, but the utility took them over and was maintaining them.

Subcommittee 1 Recommendation
Accept.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Revised Text
CP5567
Section: 1 Rule: 011 A8

Submitter
Mike Anthony

Proposed Change
8. Similar systems to those listed above that are under the exclusive control of qualified persons and

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authorized by a regulating or controlling body, including those associated with an industrial, institutional, military, educational campus and/or utility interactive system.

Supporting Comment

This will strengthen understanding that the NESC covers large, multi-building educational campus-style power systems, some of which are larger in load than cooperative utilities. Many research universities have many utility purchase points and have healthcare campuses with co-generation facilities that sell back to the utility and/or provide voltage support.

Note that I am affiliated with IEEE SCC-18, IEEE Education & Healthcare Facilities Committee, and National Electrical Code Panels 1 and 15 but this proposal is submitted as a codes and standards advocate for StandardsMichigan.COM; an organization focused on user-interest safety and sustainability codes and standards for the user-interest in the education industry.

Subcommittee 1 Recommendation

Reject.

Subcommittee 1 Comment

The proposed revision to Rule 011A8 is unnecessary as the proposed items are already addressed in the definition of *private utility.*

Vote on Subcommittee 1 Recommendation

Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Deleted Text

CP5076

Section: 1 Rule: 011 C

Submitter

Mark Gray

Proposed Change

Delete Rule 011C as follows:

~~C. Types of requirements~~

~~1. These rules specify:~~

~~a. Loadings and factors related to required strength of utility structures and supported facilities;~~

~~b. Clearances and spacings between: (1) facilities of different utilities, (2) facilities of same utility, and (3) utility facilities and public facilities;~~

~~c. Grounding; and~~

~~d. Other requirements related to the safeguarding of persons and facilities, including associated safe work practices, to be employed by a utility in the exercise of its function as a utility up to the service point.~~

~~2. Utilities operating under the NESC are required to maintain control over the system up to the service point such that:~~

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~~a. The system is designed to meet the requirements of specified conditions, and~~

~~b. The personnel installing, maintaining, and operating the system and its components are qualified to do so, are adequately supervised, use appropriate tools, and follow safe work procedures.~~

Supporting Comment
There is absolutely no rationale for having this language in the NESC. It adds nothing or meaningful to the Scope rules and can be misinterpreted by utility engineers. Scope rules should cover what is covered and not covered by the NESC, the demarcation point between the NESC and the NEC. They should not have language that covers the "types of requirements." For example a recent 2022 NESC CP concerning Rule 110C1 was proposed to the Southeastern Electric Exchange as follows:

"All stationary equipment shall be supported and secured in a manner consistent with ~~reasonably expected~~ the conditions of service *and manufacturer requirements. Their supporting structures and foundations shall be designed and constructed to withstand at a minimum the loading conditions specified in NESC Section 25 plus any applicable seismic conditions.* Consideration shall be given to the fact that certain heavy equipment, such as transformers, can be secured in place by their weight. However, equipment that generates dynamic forced during operation may require appropriate additional measures.

NOTE: Wind District loading need not be considered. For loading and factors not shown in NESC Section 25, see ASCE 7-05 and ASCE/SEI 113.

Supporting Comment
Rule 011C 1a states "these rules specify: Loadings and factors related to required strength of utility structures and supported facilities." However, "loadings and factors" for supply stations are not presented thus it is unknown what loadings and any applicable factors should supply station structures minimally withstand.

The supporting statement refers to Rule 011C1a, which states that loadings and factors are specified for "utility structures and supported facilities," which would lead one to believe it is all inclusive and would also include supply stations. Since "utility structures" is not defined in the NESC, it could mean those in a supply station as the submitter thought, even though Rule 201 states that facilities in a supply station are not covered by Part 2 rules. This rule is obviously written from the perspective of overhead lines (Part 2) only, although the implication is that it covers all rules in the NESC including underground and supply stations just based on the title "These rules cover." Rule 011C was added during the 2012 Code due to "negotiations and harmonizing" between an NESC and an NEC task force. It was also stated in the NESC supporting statement that "Similar proposals will be made for change in the NEC after consideration of this and related proposals by the NESC this fall." The NEC has never made and/or incorporated similar proposals for their code. Scope Rules 011A and 011B adequately cover the facilities of what is covered and not covered in the NESC as it relates to the NEC. Ambiguous and incomplete rules like this in Section 1 can open up the opportunity for misinterpretation by utility designers as shown by the example above.

Subcommittee 1 Recommendation
Accept.

Vote on Subcommittee 1 Recommendation
Affirmative: (7) Eric K. Engdahl, Lauren E. Gaunt, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock
Negative: (1) James Houston

Explanation of Vote
James Houston: Rule 011C specifies the types of requirements to be included in the NESC as defined by the scope. To remove utility facilities from Rule 011C1d and Rule 010A present many issues since facility safety is often indirectly related to public and worker safety. The argument in the Subcommittee 1 meeting was that

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"facilities" were recently added to the Code and was not needed. This may true for the term *facilities* but it is used in place of the term "associated equipment," which dates back to the scope contained in the 1973 Code. The term "similar equipment" was used in the 1948 H30 code scope. If SC1 intends to remove facilities from the scope and purpose, it needs to return some form of the term *equipment*. Equipment requirements are a large part of the supply station rules and is needed. "Utility facilities" is the better term.

Deleted Text
CP5355
Section: 1 Rule: 011 C1d

Submitter
Scott Smith

Proposed Change
Revise Rule 011C1d by deleting "and facilities" as follows:

C. Types of requirements

1. These rules specify:

d. Other requirements related to the safeguarding of persons ~~and facilities~~, including associated safe work practices, to be employed by a utility in the exercise of its function as a utility up to the service point.

Supporting Comment
There is absolutely no rationale for having this language in the NESC. This Code has always been about the safeguarding of persons only. It has the potential to open the door for utilities to be sued due to outages because the utility didn't safeguard their facilities thus causing an outage and an NESC violation. In the 2017 Code "affected property" was removed because it was ambiguous, not understood, or defined, and could only harm utilities. This language also needs to be removed for similar reasons.

Subcommittee 1 Recommendation
Accept in principle.

Subcommittee 1 Comment
See action taken on CP5076.

Vote on Subcommittee 1 Recommendation
Affirmative: (7) Eric K. Engdahl, Lauren E. Gaunt, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock
Negative: (1) James Houston

Explanation of Vote
James Houston: See comment in support of negative vote for CP5076.

Revised Text
CP5354
Section: 1 Rule: 012 C

Submitter
Scott Smith

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Proposed Change

012. General rules

A. …

B. …

C. For all particulars not specified, but within the scope of these rules, as stated in Rule 011A, design, construction, operation, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for ~~the construction or maintenance of~~ the communication or supply lines and equipment.

Supporting Comment

Adding *design* and *operation* makes this consistent with other parts of Rule 012C and does not allow a free pass for these activities when all particulars are not specified in the NESC.

Delete "the construction and maintenance" part for those responsible since those responsible may also include "those responsible" for the design and operation aspect. Those responsible would be all inclusive and just include the supply or communication utilities that own the lines. This deletion would also not require a repetition of the above.

Subcommittee 1 Recommendation

Accept.

Vote on Subcommittee 1 Recommendation

Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Revised Text
CP5057

Section: 1 Rule: 013 A2c

Submitter

Mickey B. Gunter

Proposed Change

Revise Rule 013A2c by replacing "facilities" with "lines" as follows:

2. Types of construction and methods of installation other than those specified in the rules may be used experimentally to obtain information if:

a. Qualified supervision is provided,

b. Equivalent safety is provided, and

c. On joint-use lines ~~facilities~~, all affected joint users are notified in a timely manner.

Supporting Comment

There is an NESC definition of "joint-use lines"; there is none for "joint-use facilities." During the NESC-NEC Definition Task Force discussions, it became apparent the NESC needs to make sure there is a correlation between NESC definitions and rule usage. Presently there is no NESC rule that uses the definition "joint-use lines." Generally NESC definitions that were not used in any rule were deleted. By replacing the word "facilities" with "lines," a rule will be established that contains the definition.

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Subcommittee 1 Recommendation
No action taken.

Subcommittee 1 Comment
The CP was withdrawn by the submitter.

New Text
CP5352
Section: 1 Rule: 013 B

Submitter
Scott Smith

Proposed Change
Revise Rule 013B as follows:

B. Existing installations

1. Where an existing installation meets, or is altered to meet, these rules, such installation is considered to be in compliance with this edition and is not required to comply with any previous edition.

2. Existing installations, including maintenance replacements~~,~~ that currently comply with prior editions of the Code, need not be modified to comply with these rules. When an existing installation is brought into compliance with a subsequent edition, earlier editions no longer apply.

~~*EXCEPTION 1:* For safety reasons, the administrative authority may require compliance with these rules.~~

EXCEPTION ~~2~~: When a structure is replaced, the current requirements of Rule 238C shall be met, if applicable.

3. Where conductors or equipment are added, altered, or replaced on an existing structure, the structure or the facilities on the structure need not be modified or replaced if the resulting installation will be in compliance with either:

(a) the rules that were in effect at the time of the original installation, or

(b) the rules in effect in a subsequent edition to which the installation has been previously brought into compliance, or

(c) the rules of this edition in accordance with Rule 013B1

~~(a) the rules that were in effect at the time of the original installation, or (b) the rules in effect in a subsequent edition to which the installation has been previously brought into compliance, or (c) the rules of this edition in accordance with Rule 013B1~~. When an existing installation is brought into compliance with a subsequent edition, earlier editions no longer apply.

EXCEPTION: For safety reasons, the administrative authority may require compliance with these rules.

Supporting Comment
The last sentence in Rule 013B3 needs to be added to Rule 013B2 as this requirement also applies to 013B2. Reformatting Rule 013B3 to show the options in bullet form will make it easier to read and apply. Exception 1 in Rule 013B2 should apply to all Rules 013B1, 013B2, and 013B3, and not to just 013B2.

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Subcommittee 1 Recommendation
No action taken.

Subcommittee 1 Comment
The CP was withdrawn by the submitter.

Revised Text
CP5059
Section: 1 Rule: 013 B

Submitter
Mickey B. Gunter

Proposed Change
Revise Rule 013B as follows:

B. Existing installations

1. Where an existing installation meets, or is altered to meet, these rules, such installation is considered to be in compliance with this edition and is not required to comply with any previous edition.

2. Existing installations, including maintenance replacements~~,~~ that currently comply with prior editions of the Code, need not be modified to comply with these rules. When an existing installation is brought into compliance with a subsequent edition, earlier editions no longer apply.

~~*EXCEPTION 1:* For safety reasons, the administrative authority may require compliance with these rules.~~

EXCEPTION ~~2~~: When a structure is replaced, the current requirements of Rule 238C shall be met, if applicable.

3. Where conductors or equipment are added, altered, or replaced on an existing structure, the structure or the facilities on the structure need not be modified or replaced if the resulting installation will be in compliance with either:

(a) the rules that were in effect at the time of the original installation, or

(b) the rules in effect in a subsequent edition to which the installation has been previously brought into compliance, or

(c) the rules of this edition in accordance with Rule 013B1

~~(a) the rules that were in effect at the time of the original installation, or (b) the rules in effect in a subsequent edition to which the installation has been previously brought into compliance, or (c) the rules of this edition in accordance with Rule 013B1~~. When an existing installation is brought into compliance with a subsequent edition, earlier editions no longer apply.

EXCEPTION: For safety reasons, the administrative authority may require compliance with these rules.

Supporting Comment
The last sentence in Rule 013B3 needs to be added to Rule 013B2 as this requirement also applies to 013B2. Reformatting Rule 013B3 to show the options in bullet form will make it easier to read and apply; there were no changes to the content in the re-formatting. Exception 1 in Rule 013B2 should apply to all Rules 013B1,

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013B2, and 013B3. Delete the comma after "that" in Rule 013B2 to be grammatically correct.

Subcommittee 1 Recommendation
Accept as modified.

B. Existing installations

1. Where an existing installation meets~~,~~ or is altered to meet~~,~~ the rules in this edition~~,~~ ~~these rules~~ such installation ~~is considered to be in compliance with this edition and~~ is not required to comply with any previous edition.

2. Existing installations, including maintenance replacements~~,~~ that currently comply with prior editions of the Code, need not be modified to comply with the rules in this edition ~~these rules~~. When an existing installation is brought into compliance with a subsequent edition, earlier editions no longer apply.

~~*EXCEPTION 1:* For safety reasons, the administrative authority may require compliance with these rules.~~

EXCEPTION ~~2~~: When a structure is replaced, the current requirements of Rule 238C shall be met, if applicable.

3. Where conductors or equipment are added, altered, or replaced on an existing structure, the structure or the facilities on the structure need not be modified or replaced if the resulting installation will be in compliance with either:

(a) the rules that were in effect at the time of the original installation, or

(b) the rules in effect in a subsequent edition to which the installation has been previously brought into compliance, or

(c) the rules of this edition in accordance with Rule 013B1

~~(a) the rules that were in effect at the time of the original installation, or (b) the rules in effect in a subsequent edition to which the installation has been previously brought into compliance, or (c) the rules of this edition in accordance with Rule 013B1~~. When an existing installation is brought into compliance with a subsequent edition, earlier editions no longer apply.

EXCEPTION: If taller and/or stronger supporting structures are required solely to meet the clearance and/or strength requirements of Rule 013B3, it is considered new construction and the rules in this edition shall apply.

4. For structures that currently do not comply with Rule 013B3, if adding a new item, or replacing or rearranging existing items would not in itself, either (1) create a structural, clearance, or grounding non-conformance, or (2) worsen an existing non-conformance, then the addition, replacement, or alteration may be performed prior to correcting existing non-compliance items. For existing non-compliance items, see Rules 214A4 and A5.

EXCEPTION: For safety reasons, the administrative authority may require compliance with the rules in this edition ~~these rules~~.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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New Text
CP5058
Section: 1 Rule: 013 B2

Submitter
Mickey B. Gunter

Proposed Change
Revise Rule 013B2 by adding Exception 3 as follows:

2. Existing installations, including maintenance replacements, that currently comply with prior editions of the Code, need not be modified to comply with these rules.

   EXCEPTION 1: For safety reasons, the administrative authority may require compliance with these rules.

   EXCEPTION 2: When a structure is replaced, the current requirements of Rule 238C shall be met, if applicable.

   EXCEPTION 3: When a supporting structure is replaced with a taller or stronger supporting structure, the resulting installation shall comply with the requirements of the current edition of the NESC.

Supporting Comment
Both Interpretation Request (IR) 215 (Mar 13, 77) and IR 344 (May 21, 84) state that poles replaced with taller or stronger poles must meet the current edition of the NESC and are not considered "maintenance" replacements. Many litigation cases I have been associated with involve trying to establish the meaning of "maintenance replacements" to determine if a structure that is replaced is considered "maintenance" or "new construction" to determine which Code is applicable. Similar language needs to be incorporated in Rule 013B2 as Exception 3 to aid the utility in determining which Code the structure in question would come under.

Subcommittee 1 Recommendation
No action taken.

Subcommittee 1 Comment
The CP was withdrawn by the submitter.

New Text
CP5077
Section: 1 Rule: 013 B4

Submitter
Mark Gray

Proposed Change
Revise Rule 013B4 as follows:

4. For supporting structures that currently do not comply with Rule 013B3, if adding a new item, or replacing or rearranging existing items would not in itself, either (1) create a structural, clearance, or grounding non-conformance, or (2) worsen an existing non-conformance, then the addition, replacement, or alteration may be performed prior to correcting existing non-compliant~~tee~~ conditions or defects ~~items~~.

   For existing non-compliant~~tee~~ conditions or defects ~~items~~, see Rules 214A4 and 214A5.

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Supporting Comment
Add "supporting" to structures to make clear this rule is about utility supporting structures and not served structures such as buildings. Also, the term "item" is generally considered a "thing" or "object" so condition or defect is the proper terminology and is consistent with the terminology used in Rules 214A4 and 214A5. The reference to Rule 214A5 should indicate the reference to the whole rule and not just a part of it.

Subcommittee 1 Recommendation
No action taken.

Subcommittee 1 Comment
This CP was withdrawn by the submitter.

Revised Text
CP5351
Section: 1 Rule: 013 B4

Submitter
Scott Smith

Proposed Change
Revise Rule 013B4 as follows:

4. For supporting structures with an existing non-compliant condition or defect ~~that currently do not comply with Rule 013B3~~, if adding a new item, or replacing or rearranging existing items would not in itself, either (1) create a structural, clearance, or grounding non-conformance, or (2) worsen an existing non-conformance, then the addition, replacement, or alteration may be performed prior to correcting existing non-compliant~~tee~~ conditions or defects ~~items~~.

   For existing non-compliant~~tee~~ conditions or defects ~~items~~, see Rules 214A4 and 214A5.

Supporting Comment
Add "supporting" to structures to make clear this rule is about utility supporting structures and not served structures such as buildings. This rule is applicable to supporting structures with existing non-compliance conditions or defects and adding this language better conveys that intent rather than the reference to Rule 013B3, which really doesn't convey that intent clearly. Also, the term "item" is generally considered a "thing" or "object" so condition or defect is the proper terminology and is consistent with the terminology used in Rules 214A4 and 214A5. The reference to Rule 214A5 should indicate the reference to the whole rule and not just a part of it.

Subcommittee 1 Recommendation
No action taken.

Subcommittee 1 Comment
This CP was withdrawn by the submitter.

Revised Text
CP5060
Section: 1 Rule: 014 B

Submitter
Mickey B. Gunter

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Proposed Change

Revise Rule 014B by deleting the word "overhead" from the title as follows:

B. Temporary ~~overhead~~ installations

When an installation is temporary, or where facilities are temporarily relocated to facilitate other work, the installation shall meet the requirements for non-temporary installation except that the strength of material and construction for overhead installations shall be not less than that required for Grade N construction. See Rule 263.

Supporting Comment

This rule should apply to underground temporary installations also. For example, an underground temporary service has to be buried at the proper depth and not laid on ground level in duct. An emergency installation is the only time a cable may be laid on ground level per Rules 014A2, 230A2d, and 311C.

Subcommittee 1 Recommendation

Accept as modified.

B. Temporary ~~overhead~~ installations

When an installation is temporary, or where facilities are temporarily relocated to facilitate other work, the installation shall meet the requirements for non-temporary installation. Additionally, for overhead installations, ~~except that~~ the strength of material and construction shall be not less than that required for Grade N construction. See Rule 263.

Vote on Subcommittee 1 Recommendation

Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Deleted Text

CP5101

Section: 1 Rule: 015 C

Submitter

Lawrence Slavin

Proposed Change

015. Intent

A. The word *shall* indicates provisions that are mandatory.

B. The word *should* indicates provisions that are normally and generally practical for the specified conditions. However, where the word "should" is used, it is recognized that, in certain instances, additional local conditions not specified herein may make these provisions impractical. When this occurs, the difference in conditions shall be appropriately recognized and Rule 12 shall be met.

C. ~~Footnotes to a table are designated by a circle surrounding the footnote number.~~ Footnotes to a table have the same force and effect that is required or allowed by the rule that specifies the use of the table.

…

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Supporting Comment
The present format for footnotes to a table (designated by a circle surrounding the footnote number) was introduced in the 2012 edition of the NESC. The original format, however, is more consistent with that of other industry standards and documents. In general, eliminating the sentence that requires the circled number provides flexibility for future editions.

Subcommittee 1 Recommendation
Accept in principle.

Subcommittee 1 Comment
See action taken on CP5061.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Deleted Text
CP5061
Section: 1 Rule: 015 C

Submitter
Mickey B. Gunter

Proposed Change
Revise Rule 015C as follows:

C. ~~Footnotes to a table are designated by a circle surrounding the footnote number.~~ Footnotes to a table have the same force and effect that is required or allowed by the rule that specifies the use of the table.

Supporting Comment
The NESC should not specify how the footnotes are designated. This information belongs in a style guide so it can be easily changed if necessary without requiring a CP.

Subcommittee 1 Recommendation
Accept.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Revised Text
CP5548
Section: 1 Rule: 015 E

Submitter
Michael Garrels

Proposed Change

E. ~~The word "RECOMMENDATION" indicates provisions considered desirable, but that are not intended to be mandatory~~. Section E not used in this edition.

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Supporting Comment
The NESC Style Guide Task Force proposes deprecating the style of Recommendation. This style is used infrequently, there are only 6 instances, and can be replaced with the rule style or Note style without changing intent (see other change proposals). Removing the Recommendation style will draw sharper contrast between normative and informative text.

Subcommittee 1 Recommendation
Reject.

Subcommittee 1 Comment
Recommendations need to remain a valid part of the Code. This is consistent with actions on related CPs submitted concerning removal of the word *Recommendation*.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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Revised Text
CP5549
Section: 1 Rule: 015 G

Submitter
Michael Garrels

Proposed Change

G. An ~~*RECOMMENDATION,*~~ *EXCEPTION,* or *NOTE* applies to all text in that rule above its location that is indented to the same level.

Supporting Comment
The NESC Style Guide Task Force proposes deprecating the style of Recommendation. This style is used infrequently, there are only 6 instances, and can be replaced with the rule style or NOTE style without changing intent (see other change proposals). Removing the Recommendation style will draw sharper contrast between normative and informative text.

Subcommittee 1 Recommendation
Reject.

Subcommittee 1 Comment
Recommendations need to remain a valid part of the Code. This is consistent with actions on related CPs submitted concerning removal of the word *Recommendation*.

Vote on Subcommittee 1 Recommendation
Affirmative: (8) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Joseph Rempe, Samuel Stonerock

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New Text
CP5062
Section: 1 Rule: 015 G

Submitter
Mickey B. Gunter

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Proposed Change

Add EXAMPLES to Rule 015G as follows:

G. A *RECOMMENDATION, EXCEPTION,* or *NOTE* applies to all text in that rule above its location that is indented to the same level.

EXAMPLE 1: The indention below for the EXCEPTION would only apply to Rule 232A(3).

A. Application

The vertical clearances specified in Rule 232B1 apply under the following conductor temperature and loading conditions, whichever produces the largest final sag:

1. 50 °C (120 °F), no wind displacement

2. The maximum conductor temperature for which the line is designed to operate, if greater than 50 °C (120 °F), with no wind displacement

3. 0 °C (32 °F), no wind displacement, with radial thickness of ice, if any, specified in Table 230-1 for the zone concerned

EXCEPTION: The conductor temperature and loading condition for trolley and electrified railroad contact conductors shall be 15 °C (60 °F), no wind displacement, final sag, or initial sag in cases where these facilities are maintained approximately at initial sags.

EXAMPLE 2: The indention below for the EXCEPTION would apply to all three Rules 232A(1), (2), and (3).

A. Application

The vertical clearances specified in Rule 232B1 apply under the following conductor temperature and loading conditions, whichever produces the largest final sag:

1. 50 °C (120 °F), no wind displacement

2. The maximum conductor temperature for which the line is designed to operate, if greater than 50 °C (120 °F), with no wind displacement

3. 0 °C (32 °F), no wind displacement, with radial thickness of ice, if any, specified in Table 230-1 for the zone concerned

EXCEPTION: The conductor temperature and loading condition for trolley and electrified railroad contact conductors shall be 15 °C (60 °F), no wind displacement, final sag, or initial sag in cases where these facilities are maintained approximately at initial sags.

Supporting Comment

There has always been confusion as to the level of a rule that an indention applies. In Example 1, some Code users may think the Exception applies to all Rules 232A(1), (2), and (3), but it only applies to Rule 232A(3). These examples should help clarify the Code's intent. It will also help the NESC editors.

Subcommittee 1 Recommendation

No action taken.

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Subcommittee 1 Comment
This CP was withdrawn by the submitter. Defer to NESC Style Guide Task Force.

Revised Text
CP5542
Section: 1 Rule: 017 A

Submitter
Lawrence Slavin

Proposed Change
017. Units of measure

A. Numerical values in the requirements of this Code are stated in ~~the metric system and in~~ the customary inch-foot-pound system and the metric system. In text, the customary inch-foot-pound ~~metric~~ value is shown first with the metric ~~customary inch-foot-pound~~ (inside parentheses) following. Extensive detailed tables are duplicated. The first, marked ~~m~~ in, ft, or lb, contains the inch-foot-pound ~~metric (SI)~~ values; the second, marked m ~~in, ft, or lb~~, contains the~~ inch-foot-pound~~ metric (SI) values~~.~~, with corresponding ~~T~~tensions and wind loads ~~are~~ stated in newtons and pascals, the SI units of force and pressure.

Or

A. Numerical values in the requirements of this Code are stated in the metric system and in the customary inch-foot-pound system. ~~In text, the metric value is shown first with the customary inch-foot-pound (inside parentheses) following. Extensive detailed tables are duplicated. The first, marked m contains metric (SI) values; the second, marked in, ft, or lb, contains the inch-foot-pound values Tensions and wind loads are stated in newtons, the SI units of force.~~

EXCEPTION: When the metric system is used in specifying the safety rules, the quantitative values in Appendix X are applicable.

Supporting Comment
Since the NESC is a safety code for the United States (and its territories), it is more important to give preference to the commonly used Imperial values to avoid confusion to workers or others during the installation, operation, and maintenance of the networks. The proposed CP suggest two possible options: (1) to simply reverse the priorities in Rule 017, or (2) to delete the metric from the main body of the Code and include in a new appendix, which should be mandatory (normative) when using the metric system.

It is noted that there is no mention of units of temperature (°F or °C), or the use of kg for mass for metric applications. These issues are not intended to be addressed in this CP.

Subcommittee 1 Recommendation
Accept as modified.

017. Units of Measure

A. Numerical values in the requirements of this Code are stated in ~~the metric system and in~~ the customary inch-foot-pound system and the metric system. In text, the customary inch-foot-pound ~~metric~~ value is shown first with the metric ~~customary inch-foot-pound~~ (inside parentheses) following. Extensive detailed tables are duplicated. The first, marked ~~m~~ in, ft, or lb, contains the inch-foot-pound ~~metric (SI)~~ values; the second, marked m and mm ~~in, ft, or lb~~, contains the~~ inch-foot-pound~~ metric (SI) values~~.~~, with corresponding ~~T~~tensions and wind loads ~~are~~ stated in newtons and pascals, the SI units of force and pressure.

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Or

A. Numerical values in the requirements of this Code are stated in the metric system and in the customary inch-foot-pound system. ~~In text, the metric value is shown first with the customary inch-foot-pound (inside parentheses) following. Extensive detailed tables are duplicated. The first, marked m contains metric (SI) values; the second, marked in, ft, or lb, contains the inch-foot-pound values Tensions and wind loads are stated in newtons, the SI units of force.~~

EXCEPTION: When the metric system is used in specifying the safety rules, the quantitative values in Appendix X are applicable.

Or

A. Numerical values in the requirements of this Code are stated in the customary inch-foot-pound system and in the metric system ~~and in the customary inch-foot-pound system.~~ In text, the customary inch-foot-pound ~~metric value~~ is shown first with the metric value ~~customary inch- foot-pound~~ (inside parentheses) following. ~~Extensive detailed tables are duplicated. The first, marked m, contains metric (SI) values; the second, marked in, ft, or lb, contains the inch-foot-pound values. Tensions and wind loads are stated in newtons, the SI unit of force~~. Tables and figures with customary inch-foot-pound values are included in the body of the Code. Tables and figures with metric values are included in an Appendix. Each table and figure include a footnote that references the metric tables in the appendix. Customary and metric values are shown in separate tables.

Subcommittee 1 Comment

NESC Subcommittee 1 recommends the use of normative annexes for the next edition so that if separated, the metric tables will continue to be recognized as part of the Code. Public comments for this change proposal are encouraged.

Vote on Subcommittee 1 Recommendation

Affirmative: (7) Eric K. Engdahl, Lauren E. Gaunt, James Houston, Danna Liebhaber (Alternate for Nelson Bingel), Robert Molde, Keith Reese, Samuel Stonerock
Negative: (1) Joseph Rempe

Explanation of Vote

Joseph Rempe: As directed by the SC5 vote on this CP, I have voted in the negative to the motion to accept CP5542. SC5 was concerned with the perception by other nations that either currently reference the NESC or are considering referencing the NESC in the future, that the exclusion and/or relocation of the metric (SI) references and tables is not conducive to utilization of the NESC.

Subcommittee 2 Recommendation

Accept as modified.

Proposed modification

A. Numerical values in the requirements of this Code are stated in the customary inch-foot-pound system ~~metric system~~ and in the metric system ~~customary inch-foot-pound system~~. In text, the customary inch-foot-pound ~~metric value~~ is shown first with the metric value ~~customary inch- foot-pound~~ (inside parentheses) following. Tables and figures with customary inch-foot-pound values are included in the body of the code. Tables and figures with metric values are included in an Appendix. Each table and figure shall include a footnote that references the metric tables in the appendix. E~~xtensive detailed tables are duplicated. The first, marked m, contains metric (SI) values; the second, marked in, ft, or lb, contains the inch-foot-pound values.~~ Tensions and wind loads are stated in newtons, the SI unit of force.

A summary of the proposal is as follows:

— Proposal for text: Place customary units in primary position with metric values in parenthesis

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— Proposal for tables and figures: Place all metric tables and figures in an Appendix
— Each customary table to include a footnote referencing metric table can be found in Appendix
— Create separate customary and metric tables for tables and figures

Subcommittee 2 Comment
SC2 accepted modifications proposed by SC7 for CP5542.

Vote on Subcommittee 2 Recommendation
Affirmative: (8) Trevor Bowmer, Timothy Cooke, Lauren E. Gaunt, Robert Harris (Alternate for Bob Dew), James McGowan, Robert Molde, Keith Reese, Ron Wellman
Negative: (1) Trung Hiu
Absent/No Return: (4) George Arhos, David Hansen, Lee Herron, Donald Zipse

Subcommittee 2 Explanation of Vote
Trung Hiu: The proposal is not in harmony with federal government and international community.

Subcommittee 3 Recommendation
Accept as modified.

Subcommittee 3 Comment
SC3 motion to accept option 2.

Vote on Subcommittee 3 Recommendation
Affirmative: (11) George Arhos, W. Bruce Dietzman, James Houston, Mark A. Konz, Lee Kraemer, Andy Kunze, Dustin Metz, William Pollak, K. Shawn Robinson, Drew Szabo, Gregory Wolven
Absent/No Return: (1) Mehrdad Eskandary

Subcommittee 4 Recommendation
Accept as modified.

017. Units of Measure

~~A. Numerical values in the requirements of this Code are stated in the metric system and in the customary inch-foot-pound system and the metric system. In text, the customary inch-foot-pound metric value is shown first with the metric customary inch-foot-pound (inside parentheses) following. Extensive detailed tables are duplicated. The first, marked m in, ft, or lb, contains the inch-foot-pound metric (SI) values; the second, marked m in, ft, or lb, contains the inch-foot-pound metric (SI) values., with corresponding Ttensions and wind loads are stated in newtons and paseals, the SI units of force and pressure.~~

~~Or~~

~~A. Numerical values in the requirements of this Code are stated in the metric system and in the customary inch-foot-pound system. In text, the metric value is shown first with the customary inch-foot-pound (inside parentheses) following. Extensive detailed tables are duplicated. The first, marked m contains metric (SI) values; the second, marked in, ft, or lb, contains the inch-foot-pound values Tensions and wind loads are stated in newtons, the SI units of force.~~

~~*EXCEPTION*: When the metric system is used in specifying the safety rules, the quantitative values in Appendix X are applicable.~~

A. Numerical values in the requirements of this Code are stated in the customary inch-foot-pound system and in the metric system. In text, the customary inch-foot-pound is shown first with the metric value (inside parentheses) following. Tables and figures with customary inch-foot-pound values are included in the body of the Code. Tables and figures with metric values are included in

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