

NESC 2017 Changes Subcommittee 4 Clearances

NESC Workshop
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Sub-Committee 4

SC4 Development of the NESC 2017

- 310 Change Proposal Considered for the 2017 NESC
- Addressed 199 Comments to the Change Proposal
- 130 Change Proposals Accepted by SC4

Change Proposals

- Many of the Accepted CPs Did Not Change the Intent of Code but Provide Consistency Within Rules. Examples:
 - Lines and equipment with recorded conditions or defects that would reasonably be expected to endanger human persons life or property shall be promptly corrected, disconnected, or isolated. (CP4274)
 - Consistent with Rule 010
 - Clarified Where Grounding Requires Components to be Effectively Grounded (CP4299)
 - Continuation of effort started with 2012 Code.

Change Proposals

Unqualified to Unauthorized

Rule 217A

2. Readily climbable supporting structures

a. Readily climbable supporting structures, such as closely latticed poles, towers, or bridge attachments, carrying open supply conductors, which are adjacent to roads, regularly traveled pedestrian thoroughfares, or places where persons frequently gather (such as schools or public playgrounds), shall be equipped with barriers to inhibit climbing by unauthorized ~~unqualified~~ persons or posted with appropriate safety signs. (CP4279)

Antenna Clearances

Rule 235I

- Existing Rule Correct
 - Scattered within the Code
- Makes Application of the Rules Difficult for the User
- SC4 Consolidated All Antenna Requirements in Rule 235I (CP4346)

Change Proposals Considered to be of Significance

Guy Insulators

- 15 Change Proposal Submitted on Guy Insulator Rules
 - Guy Insulators were also a revision topic for 2012 Code
- SC4 Accepted Several CPs in Principle and Requested Public Comments
- 28 Comments Were Received on the Topic of Guys and Guy Insulators

Guy Insulators

- There Are Several Issues:
 - Voltage Transfer If the Guy Wire Contacts An Energized Part
 - To a portion of the guy wire within human contact
 - To communications facilities on the structure
 - Should the height above ground for the lowest portion of a guy insulator be increased from 8 feet to 10 feet? Or to 14 feet?
 - Placing the Rules into a “practical” form which can be readily applied in the field

Guy Insulators

Existing Rules

■ Rule 215C4a – 2012 NESC:

- Insulator(s) shall be positioned so as to limit the likelihood of any portion of an anchor guy, including any conductive components of the insulator(s), becoming energized within 2.45 m (8ft) of the ground level in the event that the anchor guy becomes slack or breaks below the lowest guy insulator.

■ Rule 215C4b – 2012 NESC

- Insulators shall be positioned so as to limit the likelihood of any portion of an anchor guy becoming a conductive path between: (1) and energized conductor or rigid live part and (2) a conductor of another circuit, rigid live part, or equipment in event that anchor guy becomes slack or breaks below the lowest guy

insulator

Rule 215C4a
2012 Code

Energized lines
or parts area

Guy Insulator

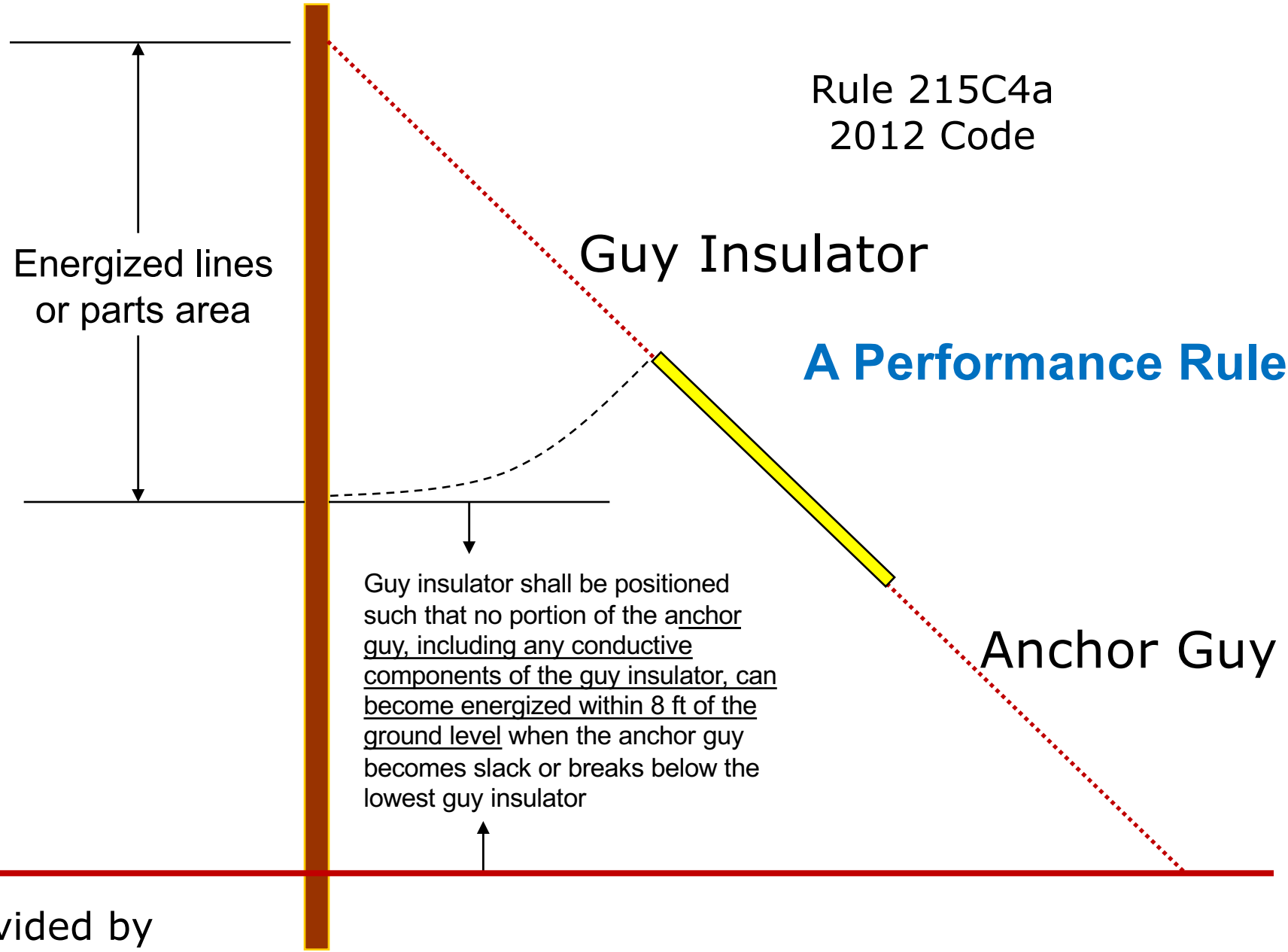
A Performance Rule

Guy insulator shall be positioned such that no portion of the anchor guy, including any conductive components of the guy insulator, can become energized within 8 ft of the ground level when the anchor guy becomes slack or breaks below the lowest guy insulator

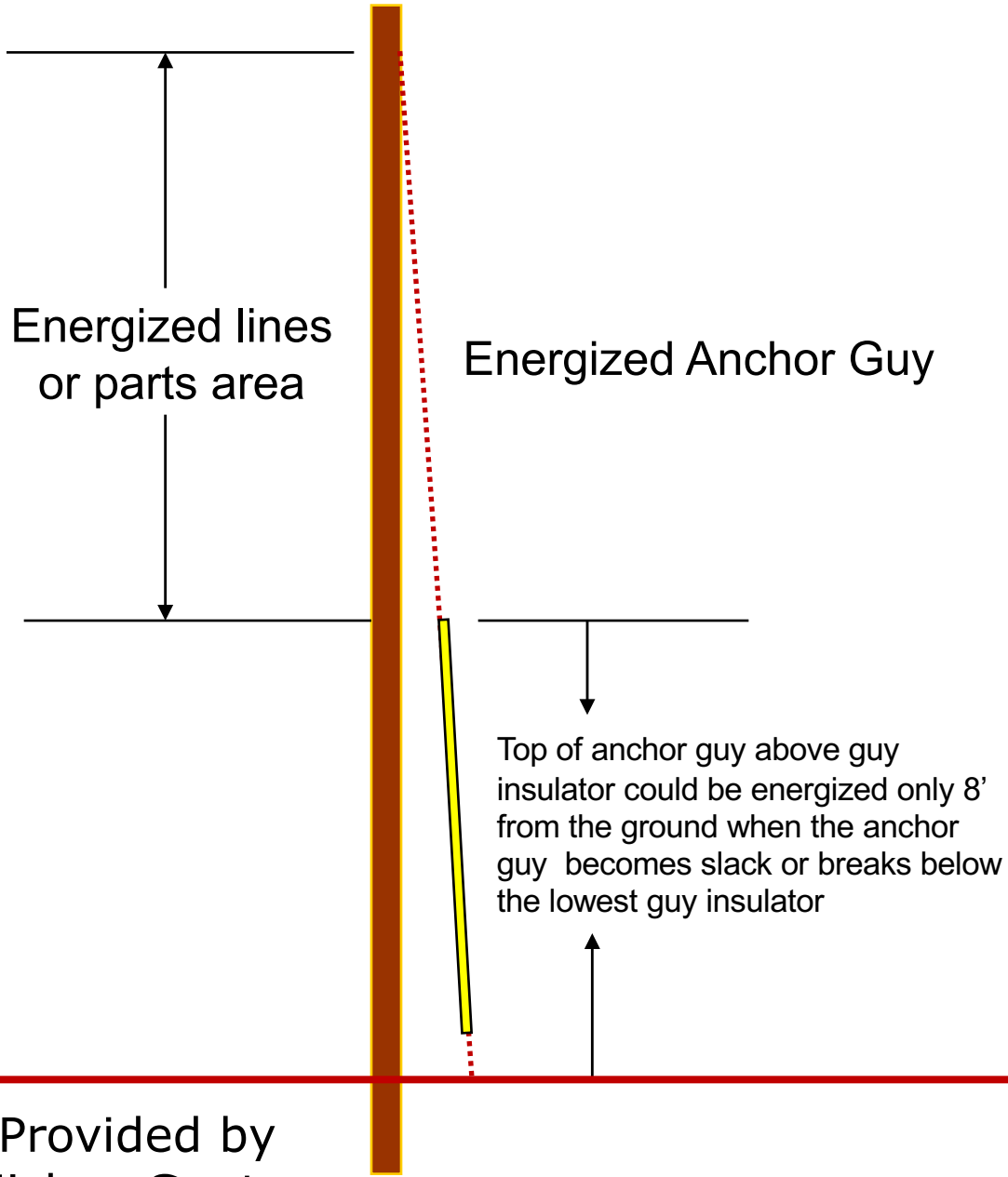
Anchor Guy

Provided by Mickey
Gunter

Rule 215C4a
2012 Code



Provided by
Mickey Gunter



Energized Anchor Guy

Rule 215C4a
2012 Code

Provided by
Mickey Gunter

Change Proposal 4701 Accepted as Modified Guy Insulators

- Rule 215C2a for 2017 NESC Requires Anchor Guys to be Effectively Grounded
 - Not a new Code requirement
 - The installation of guy insulators is an exception to the grounding rule
- Exception 2 to Rule 215C2a:
 - Guy insulators shall be positioned so as to limit the likelihood of any portion of an anchor guy becoming energized within 2.45 m (8 ft) of the ground level in the event that the anchor guy becomes slack or breaks.

2017 Major Changes to Guy Insulators

- Redefined How To Consider Clearances if Guy Wire Were to Break

From:

....in the event that the anchor guy becomes slack or *breaks below the lowest guy insulator.*

TO:

in the event that the anchor guy becomes slack or *breaks.*

2017 Major Changes to Guy Insulators

- Removed the Specific Requirement Related to Voltage Transfer on the Guyed Structure:
 - Insulators shall be positioned so as to limit the likelihood of an anchor guy becoming a conductive path between: (1) an energized conductor or rigid live part and (2) a conductor of another circuit, rigid part, or equipment in the event that the anchor guy becomes slack.
- SC Requested and Received Comments from the Communication Industry
 - Voltage transfer concerns addressed by work rules and need not be addressed in Rule 215.

Guy Insulators

- SC4 Considered CPs Increasing the Position of Guy Insulators from 8 feet Above Grade to 10 and 14 feet.
 - Proposed increases were not accepted
 - SC4 Felt the Submitted Change Proposals Offered Insufficient Justification
 - No incidences where 8 feet was not sufficient were presented
 - 8 foot requirement goes back to the 3rd edition NESC

Additional Guy Change Proposals

■ Table 235-6

Clearance of line conductors from	Communi- cation lines in general (in)	Communi- cation lines on jointly used structures (in)	Supply lines			
			Circuit phase-to-phase voltage			
			Neutral conductors meeting Rule 230E1 (in)	0 to 8.7 kV ⁽¹⁾ (in)	Over 8.7 kV to 50 kV (in)	Over 50 kV to 814 kV ^{(4) (3)} (in)
2. Span or guy wires ⁽¹⁾ , or messengers attached to same structure—at or near the support						
a. When parallel to line	3 ⁽⁷⁾	6 ^{(1) (7)}	6 ^{(1) (7)}	12 ⁽¹⁾	12 plus 0.4 per kV in excess of 8.7 kV	29 plus 0.4 per kV in excess of 50 kV
b. Anchor guys	3 ⁽⁷⁾	6 ^{(1) (7)}	6 ^{(1) (7)}	6 ⁽¹⁾	6 plus 0.25 per kV in excess of 8.7 kV	16 plus 0.25 per kV in excess of 50 kV
c. All other	3 ⁽⁷⁾	<u>6</u> ^{(1) (7)}	6 ^{(1) (7)}	6 ⁽¹⁾	6 plus 0.4 per kV in excess of 8.7 kV	23 plus 0.4 per kV in excess of 50 kV

Additional Guy Change Proposals

Table 235-6

- Questions Surrounding Existing Table:
 - Application of “parallel to line”
 - Application of “anchor guys”
 - And what facilities are included in “all other”
- CP4715 Attempted to Address
 - Received 4 comments
- Comment 6277
 - Provided guidance as to application of “parallel”
 - Removed “all other”

Additional Guy Change Proposals

Table 235-6

- Upon Additional Review, SC4 Determined CP4715 as Modified by the Comments Contained Unintended Consequences
 - There were differing interpretations by companies as how to apply the existing rules
 - Thus, there was no consensus if the existing rules required revision
 - The proposed revisions required increase clearances in specific applications
 - How the existing rules were being interpreted determine whether these clearance increases were minor or significant

Additional Guy Change Proposals

Table 235-6

- CP4715 was rejected by SC4
 - No changes to rows 2a, 2b, or 2c
- SC4 Felt Table 235-6 Needs to be Clarified
 - Discussions and received comments clearly indicate that the application of the existing table is not uniform.
 - Working Group Formed
 - Review the clearances between energized parts and down guys. Table 235-6 Row 2a, b, and c.

Additional Guy Change Proposals

- 217 C. Protection and marking of guys
 - Several Change Proposals and Comments
 - Issue focused on adequate guy wire marking in areas exposed to pedestrian traffic
 - What is a pedestrian traffic area?
 - When multiple guy wires are involved
 - How many must be marked?
- Added Note to 217C1(a):
 - *NOTE:* There is no intent to require markers at all anchor guy locations. (CP4453)

Vegetation Management

- Two Change Proposals Considered
 - Expand existing rule to include vegetation that may damage communication facilities (CP4583)
 - Remove Note stating it is not practical to prevent all vegetation contact (CP4430)
- The Issues Revolved Around the Safety Aspects of Vegetation Management
 - Is contact with communication facilities a “safety issue”?
 - When vegetation “conditions” result in Code violations (clearances, loading, etc.)

Vegetation Management

- SC4 Approved:

- Rule 218

- A. General

1. ~~Vegetation that may damage ungrounded supply conductors should be pruned or removed.~~ Vegetation management should be performed around supply and communication lines as experience has shown to be necessary. ~~Vegetation that may damage ungrounded supply conductors should be pruned or removed.~~

Relative Levels of Supply and Communication Lines

Two Issues Considered

- Revised Rule 220B1 to State that Supply Conductors and Equipment Should be Carried at the Higher Level
- Rejected CP4597 Creating Communication Space and Worker Zone Above and Below Supply Space
 - Communication facilities in the supply space are “communication located in supply space”

Table 232-1

Service Drop Clearances over Residential Driveways and Yards

- 16' is the Basic Clearance Over a Driveway
 - Footnote 13 permits a reduction to 15'
 - Footnote 7 permits a reduction to 12'
 - Dependent on “height of the house”
- Footnote 7 was Revised to:
~~Where the height of a residential building does not permit its service drop(s) to meet these values,~~ Where vehicles exceeding 8 ft in height are not normally encountered nor reasonably anticipated, ~~service drop(s)~~ the clearances over residential driveways only may be reduced to the following:

No Change in Clearances

Table 232-1

Service Drop Clearances over Residential Driveways and Yards

- Footnote 13 was Revised to:

Where this construction crosses over or runs along (a) alleys, non-residential driveways, or parking lots not subject to truck traffic, or (b) residential driveways, this clearance may be reduced to 15 ft.

- These Revisions to Table 232-1

- Removed the house height as the factor for reduced clearances
- Made the land use under the service drop, the vehicle height the factor to consider when reducing the clearances.

Street Light Brackets

- Revised Table 238-2 to Require 40" Clearance Between an Ungrounded Street Light Bracket and Communication Facilities Within the Communication Space (CP4139).
 - Currently, 20" required
 - Not considered adequate if the street light bracket were to become energized
 - Clearance can be reduced to 4" if street light bracket grounded.

Working Group Reports

WGs Established at October, 2013 SC4 Meeting

- Working Groups Were Assigned to Provide SC4 Direction on Specific Change Proposals
 - WG 4.1 (CP 4683)
 - Determine if a new extreme ice loading criteria is required for road crossings
 - WG 4.2 (CP4468)
 - Determine if the Code needs to develop clearances to agricultural irrigation systems and water streams

Working Group 4.1

Extreme Ice Loading

- Three Comments to the Change Proposal 4683 Considered by the WG
 - SC4 requested additional information from commenters
 - No specific documented cases were provided where the existing NESC road clearances were insufficient

Working Group 4.1

Extreme Ice Loading

- WG 4.10 Previously Reviewed Possible Clearance Increases Based on Rule 250D Ice Loadings
 - Found the existing method to determine clearances is credible
 - Based upon a safety record of some 70 years
- WG Conclusion: No Change to SC4's Action to Reject CP4683
 - Extreme ice loading conditions for road clearances not required

Working Group 4.2

Clearances to Agricultural Irrigation Systems

- Three Comments to CP4468 Were Considered by the Working Group
 - Two comments supported the need for the NESC to provide specific clearance rules but offered no suggestions or insight as to how to frame the clearances
 - The third commenter felt the NESC currently contained sufficient guidance for a Code user to provide adequate clearances

Working Group 4.2

Clearances to Agricultural Irrigation Systems

- The Working Group Did Not Have Adequate Time to Draft and Finalize a Written Report to SC4
 - Verbal report supported the position that the Code currently contained adequate rules for a Code user to provide clearances to large irrigation systems
- The Working Group Elected to Continue
 - Provide a written report to SC4

Questions?