POBIIC UTITITIES COMASSION OF THE STAIE OF CAITFORNLA
SAFETY DIVISION
RESOLUTION SU-10 UTILITIES SAFETY BRANCH

BESQL区IIQN

RESOLUTION SU-10, ORDER AUTHORIZING RULE CHANGES
TO GENERAL ORDER NO. 95 (G.O. 95).
RULES FOR OVERHEAD ELECTRIC IINE CONSTRUCTION

## SLDRQARX

1. The staff of the Safety Division's Utilities Safety Branch requests authorization for changes to G.O. 95 contained in the enclosed Appendix A.
2. The request follows submittal of proposed changes by the General Orders $95 / 128$ Rules Committee, which is composed of representatives from operators of electric and communications lines in california. The committee has obtained a consensus of investor owned utilities, utility districts, municipalities, the California Cable Television Association, and the associated labor unions concerning the changes.
3. The changes authorized are to rules concerning strength of materials, grounding, bonding, conductor clearances, conductor spacing, gay clearances, guy sectionalizing insulators, troliley line clearances, and commanication service drops.

## BACKGROUND

1. The changes are the result of informal proposals by the General Orders $95 / 128$ Rules Comittee. The committee represents operators of overhead and underground lines and the associated labor unions in California. It was formed by the line operators to review electric and communication line construction and maintenance methods and materials. All cperators are invited to participate in ongoing workshops held in numerous locations each year to consider state-of-the-art methods and materials for the industry, along with changes in the General Orders.
2. Members of the Commission's Utilities Safety Branch staff attend meetings of the rules committee and its subcommittees to participate in its discussions and assist in its work.

## EJNQRNES

1. 

We find that the changes to G.O. 95 authorized in this Resolution are just and reasonable.

MHEREEORE.IT IS ORDEREXD_TXAT:

1. The changes in text shown in Appendix A shall be made in G.O. 95.
2. All sulcs changed shall be marked "Revised January 21 , 1992, by Resolution SU-10".
3. This resolution is effective today.

I hereby cortify that this Resolution was adopted by the Public Utilities Commission at its regular meeting ory January 21, 1992. The following comissioners approved it.


DANIEL WM. FESSLER
president JORN B. OEANIAN PATRICIA M. ECKERT NORMAN D. SHOMWAY Commissioners

# CORRECTION 

## THIS DOCUMENT HAS

## BEEN REPHOTOGRAPHED <br> TO ASSURE <br> LEGIBILITY

3. When a study group or subeomittee of the "Ruies Comittee" drafts a rule change proposal, the draft is sent to the whole comittee for evaluation. The proposal may be modified to obtain a consensus of the committee; if consensus is not reached, the proposal is dropped.
4. After a final draft of the proposed rule changes is approved in committee meetings the draft is mailed with a ballot to all members so that those who may have missed any discussion sessions may review and vote on each change. Any dissenting vote requires that meetings be held to resolve the issues.
5. Safety is of primary concern when a rule change is proposed. As noted in the rationale for changes in Appendix A, salety to workers and the general public is considered.

## DTSCOSSTON

1. The proposed rule changes are presented in the enclosed Appendix A. A list of the rules is contained in the Table of Contents of Appendix A.
2. The rule changes are divided generically into eighteen (18) items. Each is preceded with the rationale explaining the change, followed by the existing rule and the proposed rule changes (deletions struck out and additions underlined), and the rinal proposed ruje marked by an asterisk (*).

The following sections of the General orders are affected by the proposal:

General order No, 95, Bules: 48, 49, Table 4, 52.7-F, 53.4, $54.4-\mathrm{A}, 54.4-\mathrm{C} 4 \mathrm{~b}, 54.4-\mathrm{D} 6 \mathrm{~b}, 54.8,54.10-\mathrm{D}, 54.12$ (new rule). 56.4-A1, $56.4-\mathrm{C} 2,56.4-\mathrm{C} 3,56.4-\mathrm{C} 4,56.4-\mathrm{D}, 56.4-\mathrm{F}, 56.5,56.6-\mathrm{A}$, $56.6-\mathrm{D}, 56.7-\mathrm{A}, 56.7-\mathrm{B}, 56.7-\mathrm{C}, 56.8-\mathrm{A}, 56.8-\mathrm{C}, 57.4-\mathrm{A}, 57.4-\mathrm{B} 2$, 57.4-F, 57.4-G, 57.5, 57.7, 59.3-A, 59.3-F, $74.4-\mathrm{E}, 77.4-\mathrm{B}$, 84.8-A, 84.8-B1, 84.8-B2, 84.8-C, 84.8-C1, 84.8-C2, 84.8-C3, 84.8-D1, and 92.1-F4.
3. Except for the addition of Figures 54-9, 56-1, 56-2 and 92-1, where a pictorial representation is part of the rule, the pictorial representation has been taken from the appendix at the end of G.O. 95 and moved into the text of the rule. This should lend clarity and aid in the interpretation of the zules.
4. The staft believes the changes provide for increased safety to workers and the general public; the changes incorporate state-of-the-art methods and materials and should provide for economical construction and maintenance. The Safety Division staff recommends authorization of the changes.

## EONOLNES

1. We find that the changes to G.0. 95 authorized in this Resolution are just and reasonable.

THERRETORE. 2 X IS_ORDERED THAT:
2. The changes in text shown in Appendix A shall be made in G.O. 95.
2. All rules changed shall be marked "Revised January 21, 2992, by Resolution SU-10".
3. This resolution is effective today.

I hereby certify that this Resolution was adopted by the public Utilities Comission at its regular meeting ory January 21, 1992. The following Comissioners approved it.


DANIEL WM. FESSLERR
president JOEN B. OHANTAN PATRICIA M. ECKERT NORMAN D. SHOMWAY Commissioners

APPENDIX A

## EROPOSED RULE GHANGES

RULES FOR OVERHEAD IINE CONSTRUCTION, GENERAI ORDER NO. 95

STATE OF CAIIFORNIA PUBLIC UTILITIES COMMISSION
NOTE: (1) For each rule proposed to be changed, the appendix provides the following:
(a) The rationale for the change.
(b) The existing rule and the proposed rule changes, with deletions struck out and additions underlined.
(c) The final proposed rule, marked by an asterisk (*)
(2) The changes are divided generically into 18 items.

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```
RAMIONAIE FOR RROROSED RULE CHANGES
    MANERTAL GTRENGTH
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    - RULE 19 -
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```

present General order 95 language restricts erossarm and structural materials, which limits the ability to apply new state-of-the-art techology. Inis proposal would allow the use of other materials.

## 48. UTTIMATE STRENGTH OF MATERTALS

Values used for the vitimate mitengh of materials, in connection with the safety specified in Rule 44 shali te not more than as foliows:

### 48.1 Wood

Values used for moanil of mpture for wood in bending. in conjunction with the safery factors given in Rule 44, shail not exceed those shown in Table 5.

2num: 5

Hood Strewght

| Specias | Modujur of rupture to bending |  |
| :---: | :---: | :---: |
|  | Sowod zeernogilar poles, <br>  | Round Polos |
| Gedar, vesiem red ...................................... | 4,700 2bs. per sq. in. | 6,000 3bs. per 59.10. |
| Douglas fir, dense ...................................... | 6,300 1bs. par wq. 10. | 6,800 (b) dbs. per sq. in. |
| Douglas : | 5,800 dbr . par sq- 2 n . | 6,800 (b) 2bs. per sq. in. |
| Fir, widte or rad, local ................................ | 4,700 2bre per 3q. in. | 5,600 1bs. per 3c. in. |
| Pise, wouthern yellow, dense .......................... | 6.300 dbs. par 3q. in. | 6,800 (b) dbs. per sc. in. |
| Pine, soutbers yekiow, not deger ...................... | 5,800 1bs. per sq. 10. | 6,800 (b) 1bs. par sq. 40. |
| Redrood, virodn ........................................ | 5,300 2bs. per 3q. in. | 6,200 1br. per sc. in. |
| Redwod, second grovrb ................................... | 3,900 Jbs. par sq. in . | 4,600 2bs. pertsc. in. |

(a) Figures oiven are for select structural grade of material under short time loading vith the neutral plase parailel to a cide. Mileiply the vilues show by 1.4 where the neutral plame is on the diagonal of a squre. thultiply the given way by 0.55 were the joading being

 Soutbard pine poles, thix value mif be socreased to mot more then $8,000 \mathrm{lbs}$ per equare inch. Sucb poles shail be given suitable prumervitive treatmot.
NOAE: Reviend Aprid 26, 1965 by Decition 10. 68835.

### 48.2 Structural Material (Other than Wood)

Structural members and their connections shall be designed and constructed so that the struetures and parts thereof widi not fail or be seriousiy distorted at any load less than their maximun working loads (developed under the eurrent construction arrangemente with loadings as specified in Rule 43) muitiplied by the salety factor specified in Rule 44.

The safety factors spectitiad in fale 46 shail be applied as follows to stractural steed:

Tension and Benting: The field point. 33,000 pounds per square ineh. shail be divided by the rafety finctor to detemine the maximum allowable working stress.

Compression: the macimin allowable working stress shall be calculated by the foilowing formuna:

$$
\begin{aligned}
& S_{\max }=\frac{1}{E_{s}}\left(P P-(T P-12,000) \frac{1}{2}\right) . \\
& \text { Where } S_{\text {mex }}=\text { maximum allowable working stress. ibs. per sq. in. } \\
& f_{s}=\text { safety factor specified in Rule } 44 \\
& \mathrm{YP}=\mathrm{yield} \text { point of the steel. } 33,000 \text { 2bs. per sq. in. } \\
& 1 \text { = unstuported length of member, inches } \\
& z=\text { radius of gyation of member, inches }
\end{aligned}
$$

Shear: the ultimate tensile strength, 60,000 pounds per square inch, shail be muitiplied by $2 / 3$ and divided by the safety factor specisied in Rale 44 to determine the maximum allowable working stress.

Where the figures given are used, structural steel shall conform to Standard Specifications A7-39 of American Society for Testing Maieriais for earbon steed of structural quality. other values may be used for steel of othe: strength provided the yield point and ultimate tensile streng=h are dezemined by zest.

For other structual materials (other than concrete). the safety factor specified in Rule 44 shail be applied as follows:

Tension: The yield strength of the material used shall be divided by the safety factor specified in Rule 44 to detemine the maximum alioweine working stress.

Compression: The ultimate compressive strength of the material usei shall be divided by the safety factor specified in Rule 44 to obtain the aliowable working stress. The ultimate compressive strength shall be determined by suitable formulae for the material used, considezing yieie strengeh of the material. modulus of elasticity, slenderness =atio and eccentricity of comnection. In no case shall the ultimate compzessive stress be greater than the yield strength of the materiad.

Shear: The ultimate shear strength of the material used shail be divided by the safety factor specified in Rule 44 to determine the maximum allowable working stress.
yore: Ravised march 30, 2968 by Duecrion No. 73813.

### 48.3 Concrete

A. RETNFOREED CONEREIE

Values used for ultimate strengths of reinforced concrete, in conjunction with safety lactors given in Rule 44, shall not exceed the following:

> Reinforcing steel, tensile or compressive strength, pounds per square 55.000

Concrete, 1:2:4 mixture


If reinforced concrete is designed for higher strengeh vaiues which are proven by cest, sueh values may be used in lieu of the figutes givet.

## B. PRESTRESSED CONCRETE

The minimum strength of the materials used in prestressed conerese structures used in conyunction with the safety factors given in maie 4 sha:2 be as follows:

Reinforcing Steel = yield strength ......... 40.000 $\mathbf{\text { Lbs per sq in. }}$
Prestressing Steel - yield streng-h .......... I8B. 000 ibs per sq in.
Concrete - compressive strength
at 28 days ............................ 4.000 lbs per sq in.
other steength values may be used provided the strength values used for desisn are proven by tests.
Note: Rule 48.3 -B addect on Februng 13, 2974 by Decisior No. 82466.

### 48.4 Conductors. Span Wires. Guys and Messengers

Vanues used for ultimate strengths of wires and cable shall not exceed those given in Appendix B. The uttimate strengtns given in Tables 17 to 24 of Appendix B. excep: for medium-hard erawn copper, are based on the mirimun Lltimate strengths given in the standard specitications of the Anerican Society for Testing Materiais. The ultimate strengths given in Appencix $B$ for medium-hard-drawn copper are based on the standard specifications of the ASTM and provide an allowance above the minimu values of one-quarter of the fange between minimum and maximum values. For use of types of wires and cables of other materials not included in Appendix B. values for ultimate strengths similariy derived from specifications of the ASTM shall be used except that, if sueh specifications are nonexistent, maker's specifications may be used paovided that test have been made which shall justify the maker's rating for ultimate strencth.

### 48.5 Tower or Pole Foundations and Footings

In ealeulating the resistance of foundations or footings of towers, poles and pole dine structures to uplifts, the weight of concrete shall be taken as not more than 245 pounds per cubic foot and the weight of earth (calculated 30 degrees from the vertical) shall be taken as not more than 90 pounds per cubic foot. The resistance of soil to the depression of foutdations or footing shall be calculated from the best available data on the soll in question. In lieu of calculation, the strength of foundations or footings against uplift or depression may be determined by tests under the soil conditions prevailing.

EXISIING RULE
MATERTAL SIRENGIH

### 48.6 Metaliic Service and Meter Poles

Metalilic service and meter poles shall be designed and constructed so that the poles and parts thereof will not fail or by seriously distorted at any load less than the maximum working loads (see Rule 43 for loadings) multiplied by the Safety factors specified in Table 4, Rule 44. The safety factors specified in Table 4. Rule 44 shali be applied as follows:

Tension: The yield strength of the metal used shall be divided by the safety factor specified in rable 4, Rule 44 to determine the maximin allowable working stress.

Compression: The critical buckiing strength of the material used as determined by applicable formulas employing the effective slenderness ratio and yield strength, shall be divided by the safety factors specified in Table 4. Rule 44, to detemine the maximum allowable working stress.

Shear: The yield strength of the material used shall be divided by the safery factors given in Table 4, Rule 44 to detemine the maximum allowable working stress.
Nots: Added July 26, 3966 by Decisiot No. 71009.
49. DETAIEED STRENGHH REQUIREAENTS
49.1 Poles. Towers and Other Structures

## A. STRENGAH

food poles shail be of sound timber. free from defeets which would materially reduce their strength or durability and they shall have sufficient strengen to withstand, with safety factors not less than those specified in Rule 44, the maximum stresses to which they are subjected under the loading conditions specified in Rule 43. The modulus of rupture used in calculation of safety factors shall be not greater than the value given in Rule 48.1 .

Metalife, prestressed concrete and reinforced concrese poles, tower and structures, together with their foundations, shall be of such material and dimensions as to withstand. with safety factors not less than those specified in Rule 44, the maximum stresses to which they are subjected under the loading conditions specified in Rule 43. The fiber stress values used in calculation of safety factors shall be as specified in Ruies 48.2. 48.3 and 48.6.

Certain poles are subject to special stresses due to angles in the line. dead-ending of conductors or other aftachments, which stresses must be included in computing the loading and salety factor. Poles subject to these special stresses sometimes require the use of guys, in which case the pole below the point of guy attachmont shald be considered merely as a strut. the guy taking all lateral stresses. In such cases, the pole strength requirement shall apply at the point of guy attachment zather than at the ground line.

### 49.2 Crossarms

A. MATERIA*
(1) Wood: Wood erossams shall be of suitable grades of Dousias fir. Southern Yellow pine or other accepted species.
(2) Metal: Metal crossarms shall be of structural steel, cast steel. or malleable cast iron, properiy galvanized or otherwise protected to resist corrosion. or may be of any corrosion-resising metal or alloy.
(3) Prestressed Concrete: Prestressed concrete crossams may be used provided they are designed in accordance with Rule 48.3-B.

NOTE: Pat: (3) added Fabruang 13, 1974 by Decision No. 82456.
B. NENTMUM SIZE
(i) Wood: Crossamms used to support or guare supply concuesers shail have cross-sectional dimensions not less than the following:

One piece (homogeneous): $31 / 4 \times 42 / 4$ inches. Fabricated: any single member. $13 / 4 \times 41 / 4$ inches. or Leminated: $3 \times 4$ inches. Crossams supporting or guarding communication conduceors shain provide the strength of Douglas $\{15$ having a cross secinon not iess than 3 by $41 / 4$ inches except that erossams six anc one-hal: feet or less in length which support sixteen wizes of less shall provide the strength of Douglas ifir having a eross section not less than $23 / 4$ by $33 / 4$ inches.
(2) Metal: The physical properties as a result of dimensions, shape and cross-sectional area of metal crossarms shall be such as to result in sufficient strength to meet the requirements of Rules 46 , 47 and 48.2. provided the thickness of any element shall be not less than 3/32 inch.
(3) Prestressed Concrete: The minimum dimension of any prestressed concrete member shall be 3 inches.
NoIE: Part (3) added Februry 13, 1974 by Decision Mo. 82466.

## C. STRENGTH

Crossams shall be securely supported by bracing, where necessary, to withstand unbalanced vertical loads and to prevent tipping of any am sufficiently to decrease clearances below the values specified in Section III. Such bracing shall be securely attached to poles and crossarms. Supports in lieu of erossams shall have means of resisting rotation in a vertical plane about their attachnent to poles or shall be supported by braces as required for crostarms. Metal braces or attachments shall meat the requirements of Rules 48.2 and 49.8. In computing the strength requirements to meet vertical loads the effect of such bracing may be considered.

THBE 4

Honime Salety lectors

| Element óz Lint | Grades of construction |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Grade " ${ }^{\text {/ }}$ | Grade "B" | Grade "C" | Grade " ${ }^{\text {c* }}$ |
| Gonductors, splices and conductor fartendigs (other than tide wres) $\qquad$ | 2 | 2 | 2 | 1 |
| P1s ........................................................ | 2 | 2 | 2 | 1 |
| Pole ilne hardmare .......................................... | 2 | 2 | 2 | 2 |
| Line insulatore 'mechanieai) ............................... | 3 | 2 | 2 | 2 |
| Guy insulators (mecharical) |  |  |  |  |
| Interiocking ............................................ | 2 | 2 | 2 | 2 |
| Nocintarlocking nood .................................... | 3 | 3 | 3 | - |
| Nondnterlocking glass Siber ............................. | 3 | 2 (a) | 2 (b) | - |
| Guys, excapt in light looding nual durincts ........... | 2 | 2 | 2 | : 1/4 |
| Guss in light loodng nural distritts .................... | 2 | $12 / 2$ | $13 / 2$ | 1 1/4 |
| Mescengers and span wires .................................. | 2 | 2 | 2 | 2 |
| hood poles.. .................................................. | 4 | 3 | 2 | 1 |
| Metalice service and meter pohes ......................... | - | 2 | 2 | - |
| Structural or tubular metallic poles, tovers, stuctures. crossams and metailic menbers of Ioundacions. $\qquad$ | $21 / 2$ (c) | $11 / 4$ (c) | d $2 / 4$ (c) | - |
| Foundations against uplift ................................. | 1 $2 / 2$ | $11 / 2$ | $11 / 2$ | - |
| Foundacioos agadort depression ........................... | 3 | 2 | 2 | - |
| Keioforced eonerete poles ................................ | 4 | 3 | 3 | - |
| Crossams (mod)........................................... | 2 | 2 | 2 | 1 |
| Prestressed concrete poles, stavetures, and crossarms... | 1.8 | 2.5 | 2.5 | - |

(a) Insujators are to be replaced before calety factors heve betn reduced (due to deteriorstion or charges in construstion, arrapgeant, or otbar copditions subuequet to jnstaliatiop) to dess than 95 percent of the saiety factor apecified in Rule 44.1.
(b) Insulators are to be replaced before rafety fectors bave beat reduced (due to deterioration or ebanges in conaruction, arabgement, or otber coodiejons mbougunt to jortallation) to 2 ess than 75 percent of the maitetr factor specticied is Rule 4. 1.
 combination for the tascion member vould not adinger adjacent couprassion mabers, the factor of rifoty on Ultimate tension shail be 2 Grade "y" construction and 2.67 for Grades "b" and "ch conrtuction.
Next: Revised July 26, 1966 by Deaifiod No. 71009; Jenuary 6, 1968 by Decirion No. 73455; March 30, 1968 by Decision Mo. 73813 and Fobruaty 23, 2974 by Decirion No. 82466.

### 44.2 Replacement

Iines or parts thereof shall be replaced or reinforced before safety factors have been redueed (due to deterioration or changes in construetion arrangement or other conditions subsequent to installation in Grades "A" and "g" construction to less than two-thinds of the construction smifey inctors specified in Rule 44.1 and in Grades ${ }^{*} \mathrm{C} "$ and "F" construction to Iess than

## 48. GLTDMATE STRENGTH OF MATERIALS

Structurad members and their connections shall be designed and constructed so that the structures and parts thereol will not fall or be seriously distorted at any load less than their maximum working loads (developed under the eurrent construction arramgements with loadings as speciried in Rule 43) multipliec by the safety factor specified in Rule 44.

Values used for the ultimate streneth of materials shall comply with the safery factors specified in Rule 44 .


48.1 Wood

Values used for moduli of mpture for wood in bending, in conjunction with the safety factors given in Rule 44, shail not exceed those shown in Table 5 .
zunce 5

Hood Stroogths

| Sprectes | Modulus of rupture |  |
| :---: | :---: | :---: |
|  | Sowed rectangular poins, crossartas, etc. (a) | Round Poles |
| Cedar, vesters red | 4,700 Jbs. per 3q. 2 n . | 6,000 1bs. per sq. in. |
| Douglar fir, dense .-..................................... | 6,300 dbs. par aq. $\mathrm{ta}_{\text {co }}$ | 6,800 (b) lbs. par sc. ${ }^{\text {c }}$. |
| Douglas fir, sot dense ................................... | 5,800 1bs. par Eq. 10. | 6,800 (b) dha. per sq. 20. |
| Fre, witte or red, iocal | 4,700 2bs. par meg. | 5,600 lbs. per sq. 10. |
| Plise, soutberp yollow, dende ............................. | 6,300 1bs. par as. ${ }^{\text {5, }}$ | 6,800 (b) 1bse per sc. 10. |
| Pline, soutbers jellow, Dot dance ....................... | 5,800 2 dbs . par es. ib. | 6,800 (b) 1bs. per eq. in. |
| Redrood, virgl .......................................... | 5,300 dbe. per sq. in. | 6,200 1bs. per es. 20. |
| Redwsod, second grouth .................................... | 3,900 dbe. par sq. | 4,600 1bs. par ac. 20. |

(a) Figures given are for select structural grade of marial uder abort tum loudidg vitb the
 on tbe diagoos of a equare. Multiply the gives valuer by 0.55 whare the londing baing considered is a loog the londun (conthours lond for oot jear or more).
 Soutbert ploe poles, this vilue my be focmued to pot more than 8,000 lbr. per aquare 1 neh. Such polas abail be gived raitable proservative trearmat.
Hont: Reviacd 4prid 26, 1965 by Dectidion Mo. 68835.

### 48.2 Stee 1








The safety factors specified in Rule 44 shall be applied as follows to structural steed:

Tension and Bending: The yield point, 33,000 pounds per square inch. shail be divided by the safety factor to determine the maximum ailowable working stress.

Compression: the maximum allowable working stress shail be calculated by the following formula:

$$
S_{\max }=\frac{1}{E_{s}}\left(Y P-(Y F-12,00 \dot{*}) \frac{1}{Y}\right)
$$

Where $S_{\max }=$ maximum allowable worixing stress, ibs. per sq. in. $f_{s}=$ safety factor specified in Rule 44 IP m yiedd point of the steel. 33,000 dbs. per sq. in. 1 . unsupported length of member, inches y = radius of gyzation of member, inches

Shear: The ultimate tensile strength, 60.000 pounds per square inch, shail be multiplied by $2 / 3$ and divided by the safety factor specified in Rule 44 to determine the maximum allowable working stress.

Where the figures given are used, structural steed shall conform to Standard Specifications A7-39 of American Society for Testing Materials for carbon steel of structural quality. Other values may be used for steel of other strength provided the yield point and ultimate tensile strength are determined by test.















No大s: Revised Marer: 30, 2968 by Dectrion No. 73923.
48.3 Concrete
A. REINFORCED CONCRETE

Values used for uitimate strengths of reinferced concrete, in conjunction with safecy factors given in Rule 44, shail not exceet the following:

Reinforcing steel, tensile or compressive strength, pounds per square inch
55.000

Concrete. 1:2:4 mixture ........ Age Compressive


If reinforeed conerete is designed for higher strength values which aze proven by test, such values may be used in ifeu of the figures giver.
B. PRESTRESSES CONCRETE




 4 $\$ 1$

The minimum srrength of the materials used in prestressed concrete stmuetures used in conjunction with the safery factors given in Table 4 shall be as follows:

```
Reinforcing Steel = yield strength ......... 40,000 lbs per sq in.
Prestressing Steel = yield strength ......... 188,000 lbs per sq in.
Concrete - compressive strength
                        at 28 days ..............................4.000 lbs per sq in.
```

Other strength values may be used provided the strength values used for design are proven by tests.
Norc: Rule 49.3-8 added on Februnt 23, 2974 by Decrition Mo. 82456.

### 48.4 Other Structural Materials

For other structural materials. the safety factoz specified in Ruie 44 sha:1 De abslaed as follows:

Fension: The tield styengch of the material used shall be divided by the safesy factor specified in Rule 44 fo detenmine the maximum allonaine wev:inc s=-ess.

Compression: The ultimate compressive strength of the majerial used shall be divided by the safety factor specified in Ruie 44 to obeain the allowable working stress. The ultimate compressive streneth shall be detemined by suitable formulae for the material used. considering vield stenest of the material. moülus of elasticity. sienderness rasio and eccentricizy of connection. In no case shail the ultimate compzessive stress be greater than the yield strength of the material.

Shear: The ultimate shear strenfth of the material used shall be Eivided by the safety factor specified in Rule 44 to determine the maximum ejiowaile wozking stress.
48.45 Conductors, Span Wires. Guys and Messengers

Veaues used for untimete strengths of wires and cable shail not exceed those 与iven in Appendix B. The ultimate streng̈s given in Tables 17 to 24 of Appendix B. except for medium-hard dawn copper, are based on the mirimum LiEimate s=rengths given in the standard specifications of the dmerican Society Eor mesing Nazeriais. The ultimate strengths given in Appeneix B for mediumhase feawn copper ere based on the standard specitications of the ASNM enc p=ovide an allowance above the minimum values of one-quarter of the range between minimin and marimum values. For use of types of wires and cables of othe: materials not included in Appendix $B$. values for ultimate strengans similariy derived from speci£ications of the ASMM shall be used except that. if such specifications a=e nonexistent, maker's specifications may be used provided that tests have been made which shaid justify the maker's rating for ultimate strengti.

### 48.56 Tower or Pole Foundations and Footings

In ealetiating the resistance of foundations or footings of towers, poles and pole line structures to uplifts, the weight of concrete shall be taken as not more than 245 pounds per cubic foot and the weight of earth (caleulated 30 degrees from the vertical) shall be taken as not more than 90 pounds per cubic foot. The resistance of soil to the depression of foundations or footing shali be calculated from the best available data on the soil in question. In ineu of caleulation. the strength of foundations or footings against uplift or depression may be determined by tests under the soil conditions prevailing.

## 49. $\$ 7$ Metalize Service and Meter Poles

Metalijc service and meter poles shall be designed and constructed so that the poles and parts thereof wall not fail or by seriously distorted at any ioad less than the maximum working loads (see Rule 43 for loadings) maitiplied by the Safety factors specified in Toble 4. Rule 44. The safety factors specified in Table 4. Rule 44 shall be applied as follows:

Tension: The yield strength of the metal used shail be divided by the safety factor specified in Table 4 , Rule 44 to detemine the maximum allowable working stress.

Compression: The critical buckiing strength of the materidil used. as detemined by applicable fomulas employing the effective slenderness ratio and yield strength. shall be divided by the safety factors specilied in rable 4. Rule 44, to detemine the maximum allowable working stress.

Shear: The yield strength of the material used shali be divided by the safety factors given in Table 4 , Rule 44 to determine the maximum allowable working stress.
NeIt: Added Juiv 26, 2966 by Deckriot No. 71009.
49.1 Poles. Towers and Other Structures
A. STRENGTH

Wood poles shall be of sound timber. free from defects which would materially reduce their strength of durability and they shall have sufificient strength to withstand. with safety factors not dess than those specified in Rule 44, the maximum stresses to which they are subjected under the loading conditions specified in Rule 43. The modulus of rupture used in calculation of safety factors shall be/hox not be greater than the value given in Rule 48.1.








Moterials, other than wood used for poles, towers and struetures, together with their foundations, shali be of such strength as to withstand, with safety factors not less than those specified in Rule 44, the maximum stresses to which they are subjected under the loading conditions specified in Rule 43.

Certain poles are subject to special stresses due to angles in the line. dead-ending of conductors or other attachments, which stresses must be included in computing the loading and salety faccor. Poles subject to these special stresses sometimes require the use of guys. in which. sase the pole below the point of guy attachment shall be considered merely as a strut, the guy taking all lateral stresses. In such eases. the pole strength requirement shail apply at the point of guy attachment rather than at the ground line.

### 49.2 Crossarms

## A. MATERIAL

(4) Other Material: Other materials may be used for erossams prouided they comply with Rule 48.4
B. MINIMUM SIZE

The fhusical properties as a result of dimensions, shape and cross-sectional area of crossarms shall be such as to result in sufficient strengeh to meet the requirements of these Rules.









 tect







nunime Snioty Pactors

| Elenent of Lune |
| :--- |

(a) Inariators are to be raplaced before afety factors bave bead roduced (due to detarioration or
 thas 95 percent of the eafety factor specified it Rule 4.1.
(b) Insulators are to be raplaced before safety factors bave boun roduced (due to deterioration or changes is construcioc, arrangusent, or other cooditions subsequeat to fartallation) to lass that 75 parcabt of the saroty factor speciried to Rule 44.1.
(c) For aluminum maberr subject to teasion aused by ooe or gore artianted joods and whare tbe eritical load
 uletmie teasion shaji be 2 Grade "I" coartnuetion add 2.67 for Gradus "b" and "er construction.
Nore: Revieod July 26, 1966 by Dectaioc No. 72009; Japuary 6, 2968 by Docision No. 73455; Marcb 30, 1968 by Dociation 10. 73813 add Fabracty 13,2974 by Decisioc Mo. 82466.

## 48. ULTIMATE STRENGTH OF MATERIATS

Structural members and their connections shall be designed and constructed so that the structures and parts thereof will not fail or be seriously distorted at any load less than their maximum working loads (developed under the current construction arrangements with loadings as specified in Rule 43) multiplied by the safety factor specified in Rule 44.

Values used for the uitimate strength of materials shail comply with the safety factors specified in Rule 44.

### 48.2 Wood

Values used for moduli of mupture for wood in bending. in conjunction with the safety fiactors given in Ruie 44. shail not exceed those shown in Table 5.

ENBE 5

Hood Strvogths

| Species | Modulus of nupture in bending |  |
| :---: | :---: | :---: |
|  | Sawed rectangular poles, cros.arms, etc. (a) | Round Poiles |
| Codar, vestem red | 4,700 1bs. per 39. 10. | 6,000 1bs. pee sq. in. |
| Douglar ilis, dense | 6,300 dbs . par sq. in . | 6,800 (b) dbs. per sq. do. |
| Douglas tir, not dence ................................... | 5,800 1bs. per sc. in. | 6,800 (b) 1bs. per s'q. in. |
| Fir, white or red. lochl | 4,700 Jbs . per sc. in. | 5,600 2bs. per sq. in. |
| Plope, southemd jeliow, dense ............................ | 6,300 1bs. pez 39. ${ }^{\text {d. }}$ | 6,800 (b) ل1bs. per sq. d . |
| PLpe, southay jeliow, dot dense ....................... | 5,800 dbs. par zq. ib. |  |
| Redrood, vircin ........................................... | 5,300 1br. par sq. in. | 6,200 3bs. per sc. ib. |
| Redrood, metond gremb ................................... |  | 4,600 3bs. per sq. 10. |

(a) Figures ofve are for sulect xtructurai grade" of material ubdar sbort time loodfog with the povtral playe paraliel to a side. Multiply the valuas sbown by 1.4 where tbe peutral plape is on the diagooal of e square. Multiply the gived veluas by 0.55 ware tibe lowding belog conridered is a 200 g time joeding (cootiovour land for ooe jear or more).
 Soutbars pipe polas, this vilue me bipcruned to dot more than $0,000 \mathrm{dbr}$. par mure jpeh. Such polas satall be given suitible preservitive trutmat.


### 48.2 Steel

The safety factors specified in Rule 44 shall be applied as follows to structural steel:

Tension and Bending: The yield point. 33.000 pounds per square inch. shall be divided by the safety factor to determine the maximum allowable working stress.

Compression: The maximu allowable working stress shall be calculated by the following formula:

$$
\begin{aligned}
& \left.S_{\text {max }}=\frac{1}{E_{S}}\left(Y P-G^{Y P}-12.000\right) \frac{1}{z_{2}}\right) . \\
& \text { Where } S_{\text {max }}=\text { maxinum allowable working stress. ibs. per sq. in. } \\
& f_{s}=\text { safety factor specified in Rule } 44 \\
& \text { Yp = yield point of the steel. } 33,000 \text { lbs. per sq. in. } \\
& 1 \text { = unsupported length of member, inches } \\
& y=\text { yadius of gyration of member, inches }
\end{aligned}
$$

Shear: The ultimate tensile strength, 60,000 pounds per square inch, shail be multiplied by $2 / 3$ and divided by the safety factor specified in Rule 44 to determine the maximum allowable working seress.

Wheze the figures given are used, structural steel shall conform to Standard Specifications A7-39 of American Society for Testing Materials for cajbon steel of structural quality. Other values may be used for steel of other strength provided the yield point and ultimate tensile strength are detemined by zest.

## 48.3 <br> Concrete

## A. REENFORCED CONCRETE

vaiues used for ultimate strengths of reinforced concrete, in conjunction with safety factors given in Rule 44, shall not exceed the following:

Reinforcing steel, tensile or compressive strength, pounds
per square inch
55.000

Conerete. 1:2:4 mixture ......... Age
Compressive


If reinforced concrete is designed for higher strength values which are proven by test, such values may be used in lieu of the figures given.

## B. PRESTRESSED CONCRETE

The minimum strength of the materials used in prestressod concrete struetures used in conjunction with the safety iactors given in Table 4 shall be as follows:


Other strength values may be used provided the strength values used Eoz design are proven by tests．
NETE：Rule 48．3－B onded on Feoruary 25， 1974 by Dacision No． 82466.

## 48．4 Other Structural Materials

For other structural materiajs，the safety factor specified in Rule 44 shall be applied as follows：

Tension：The yield styength of the material used shail be eivided by the saiety factor specified in Rule 44 to determine the maximum alowabie working stress．

Compression：The ultimate compressive strength of the material uset shail be divided by the safety factor specified in Rule 44 to obtain the allowable working stress．The ultimate compressive strength shall be determined by sutiable formulae for the material used，considering yield strength of the material．modulus of elasticity，sienderness ratio ane eccentricity of connection．In no case shall the uitimate compressive stress be greater than the yield strength of the material．

Shear：The ultimate shear strangoh of the material used shall be divided by the safety factor specified in Rule 44 to determine the meximum allowable working stress．
NOTI：Revised March 30， 2968 by Deftrion No． 73823.
48．5 Conductors．Span Wires．Guys and Messengers
Values used for ultimete strengths of wires and cable shall not exceec those given in Appendix B．The ultimate strengths given in Tables 17 to 24 of Appendix B，except for medium－hard drawn copper，are based on the minimur ultinate strengths given in the standard specilications of the American Society for Testing Maserials．The uitimaze strengths given in Appencix B for medium－hard－drawn copper are based on the standard specifications of the ASMM and provide an allowance above the minimum values of one－quarter of the range between minimum and maximum vaives．For use of types of wires and cables of other mateziais not included in Appendix B，values for ultimate strengths similerly derived from specifications of the ASTM shall be used except that．if such specifieations are nonexietent，maker＇s specifications may be used provided that test have been made which shall justify the maker＇s rating for uitimate sもよeng゙う．

## 48．6 Tower or Pole Foundations and Footings

In calculating the resistance of foundations or footings of towers，poles and pole line structures to uplifts，the weight of concrete shall be taken as not more than 245 pounds per cubie foot and the weight of earth（calculated 30 degrees from the vertical）shall be taken as not more than 90 pounds per cubic foot．The resistance of soil to the depression of foundations or footing shall be calculated from the best available data on the soil in question．In lieu of calculation，the strength of foundations or footings．against uplift or depression may be detemined by tests under the soil conditions prevailing．

FROPOSED RUTE CHANGE (FINAL)
MATERTAT STRENGTH
48.7 Metallic Service and Meter poles

Metallic semice and meser poles shail be designed and constucted so that the poles and parts thereof will not iail or by seriousiy distoreed as any loze less than the maximurn working loads (see Rule 43 for loajings) multiplin the safery factors specisied in Tabie 4, Rule 44. The safezy iactors specified in Table 4 . Rule 44 shall be applied as f0110ws:
zension: The yield strengh of the metal uced shail be divided by the safety factor specified in Table 4 , Rule 44 t - detemme the maximin ailowable working stress.

Compression: The critdcal buckidns strength ef the materiai used, as detemined by applicable fommlas employing the effective sienderness racio and yield strength. shall be divided by the safery factors specisiod in mable 4. Rule 44, to determine the maximin allowable working seress. Shear: The yield strength of the material used shall be dided by the safety factors given in Iable 4, Rule 44 te detemine the maximin allowable working stress.
Ne:E: Added July 26,1966 by deeision Ne. 72009.

## 49.1 poles, Towers and other Structures

## A. STRENGTH

Wood poles shall be of sound timber, free from defects which woule materiaily zeduce their strength or durability, and they shall have stificient strength to withstand. with safety factors mot less than those spesifiee in Rule 44, the maximurn stresses to which they are subjected under the loading conditions specified in Rule 43. The modulus of Iuptuze used in calculation of safety factors shad not, be greater than the value Given in Rule 48.1.

MaEerials, other than wood used for poles, towers and strucsures, together with their foundations, shail be of such strenget as to withstand. with safery factors not less than those specified in Rule 44. the maximu stresses to which they are subjected under the loadins conditions specified in Rule 43.

Cezain poles are subject to special stresses due to angles in the inne, deadeending of conduetors on other atzachments, which stresses mus: be inciuded in computing the loading and safety factor. Poles subject 60 chese special stresses sometimes recaine the use of guys, in which case the pole below the point of guy atcachment shail be considered merely as a strit. The guy taking all lateral stresses. In such cases, the pole strength reguivement shail apply at the point of guy attachment racher that $a$ t the groume inge.

### 49.2 Crossarms

A. MATERINت
(4) Other Material: Other materials may be used for crossarms provided they comply with Rule 48.4
B. MLNIMOM SI2E

The physical properties as a resilit of dimensions, shape ard cross-sectional area of crosshms shall be such as to result in sufficient strength to meet the requirements of these Rules.
taind 4

Mindum Safety Factors

| Exemast of ziou | Grades of Coneraction |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Grade " ${ }^{\prime \prime}$ | Grade "B" | Grade "C" | Grace "F" |
| Gonductors, splices and conductor farteniogs (orther |  |  |  |  |
| that tie viras) ......................................... | 2 | 2 | 2 | : |
| P10s ....................................................... | 2 | 2 | 2 | 1 |
| Pole line bartuate .......................................... | 2 | 2 | 2 | 2 |
| Cint insulators (necharieal) .............................. | 3 | 2 | 2 | 2 |
| Guy insulators (menanical) |  |  |  |  |
| Interlocking .......................................... | 2 | 2 | 2 | 2 |
| Nondnteriocketh wood .................................. | 3 | 3 | 3 | - |
| Noninterlockeç glass iflbe ............................ | 3 | 2 (a) | 2 (b) | - |
| Guss, except in light lobdit stral disticts ........... | 2 | 2 | 2 | 1.25 |
| Guss in dicht ioading rural dircrices ................... | 2 | 1.5 | 2.5 | 2.25 |
| Messeggess and span wres ................................. | 2 | 2 | 2 | 2 |
| Fourdations agaiere upliff ................................ | 2.5 | 1.5 | 2.5 | - |
| Foundations against depresmin ........................... | 3 | 2 | 2 | - |
| poles Tovass and structures <br> Hood poins | 4 | 3 | 2 |  |
|  | 4 | 2 | 2 | - |
| Stevetural or tubular matalle poies, towes, revuctures, croscaras and metaillc nembers of foundocious. | 1.5 (c) | 2.25 (c) | 2.25 (c) | - |
| Reinforced concrete poles .............................. | 4 | 3 |  | - |
| Prostrossod concete poles, structures, and crossams. | 2.8 | 2.5 | 1.5 | - |
| Other Structurai Materiais ............................. | 2.5 | 1.25 | 1.25 | - |
| croscaras |  |  |  |  |
| Hood ...................................................... | 2 | 2 | 2 | 1 |
| Stee: ................................................... | 2.5 | 1.25 | 2.25 | - |
| Concrete ................................................ | 2.8 | 1.5 | 2.5 | - |
| Other Structural naterial ............................... | 2.5 | 2.25 | 1.25 | - |

(a) Inrifators are to be rephaced before safoty factors have been reduged (due to deterioration or changes in coartinction, arrangeaent, or orber conditions subsequant to instailation) to less thap 95 percent of the safert factor spactined is Rule 44.2.
(b) Insulators are to be replaced before safety factors bave bent reduced (due to deterioration or chagges in construction, argangeomat, or otber conditioas subsequent to instailation) to lass than 75 percent of the safety factor spoclefiod in Rule 44.1.
(c) For aluminum members rubject to tansion caused by one or more estimated louds and were be critical 200 d comblation for the tamsion number would det endanger adjaceat compression mabers, the factor of safaty on ultimate tension aball be 2 Grade " 2 " conatruetion and 2.67 for Grades "B" and "er constrection.
NoTE: Renised July 26, 2966 by Dectrion No. 71009; Japuaty 6, 2968 by Dectrion No. 73455; March 30, 1968 by Dectrion Ko. 73813 and February 13, 2974 by Decision No. 82466.

ITEM 2

- Rule 52.7-F
. Rule 53.4

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$$

# RATIONALE FOR PROPOSED RULE CHANGE ROLE 52.7-F HARDKARE - GROUNDING 

Remove work rules covered in CAI/OSHA Titie 8

## -EXISTING RULE RULE 52.7F

## F. GROUNDING

(1) Circuits of 0.7.500 Volts: On wood crossams, wood poles, or wood structures, hardware which is less than 3 feet above or 6 feet below unprotected conductors of 0-7,500 volts shall be nongrounded. Excepted from the requirements of this rule are the following:

Hardware of riser teminals treated as speeified in Rule 54.6-F;

Hardware associated with grounded cables and messengers supported on erossarms with vertical clearances and pole ciearances as specified in Tables 1 and 2 for such cables and messengers; and

Hardware associated with guarded cables and messengers which are treated as specified in Rule 57.4-F.
(2) Circuits of More Than 7.500 Volts: Hardware of circuits of more than 7.500 volts shall be securely and permanently grounded where such hardware can act as a bond between metal parts of the insulating supports of an energized conducror and of a de-energized portion of the same conductor or of the de-energized portion of another conductor where work is to be performed on the de-energized conductor. Such hardware includes the bases of air-break switches and the taniks of oil switches. Bond wires are excepted from this requirement, and are nor required to be grounded.

The pemanent grounding specified in this rule will not be required provided the regular writen operating (safery) sules of the utility concemed require that:

Conductors of circuits exceeding 7,500 volts which are deenergized for work thereon shall be securely grounded during all periods of such work: and

When work is to be performed at the location of hardware described in this sule. such hardwase shall be temporarily and securely grounded and securely connected to any de-enexgized conductors involved during ald work at that location. or in lieu of temporary grounding such hardware shall be proven by rest to be Donerergized immediarely preceding each period of work at that location.
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## F. GROINDENG

(1) Circuits of 0-7,500 Volts: on wood erossarms, wood poles, or wood structures, hardware which is less that 3 feer above or 6 feet below unprotected conductors of 0-7.500 volts shall be nongrounded. Pxcepted from the requirements of this File are the following:

Harware of yiser terminals treated as specified in Ruie 54.6-F:

Hardware associated with grounded cables and messengers supported on crossarms with vertical clearances and pole clearances as specified in tables 1 and 2 for such cables and messengers: and

Hardware associated with guarded cables and messengers which are treated as specifised in Rule $57.4-\mathrm{F}$.
(2) Circuits of More than 7.500 Volts: Hardware of eireuits of more than 7.500 volts shall be securely and permanentiy grounded where such hardware can act as a bond between metal parts of the insulating supports of an energized conductor and of a de-energized portion of the same conductor or of the de-energized portion of another conductor where work is to be performed on the de-energized conductor. Sueh hardware inciudes the bases of air-break switches and the tanks of oil switches. Bond wires are excepted from this requirement, and are not required to be pemanently grounded.

The permanent grounding specified in this rule will not be required provided the regular watten operating (safety) mles of the utility concerned reguire that:

Conductors of circuits exceeding 7.500 volts which are de-energized for work thereon shall be securely grounded during all periods of such work: and

When work is to be perfomed at the location of hardware described in this rule, such hardwere shall be tempozarily and securely grounded and securely connected to any de-energized conductors involved during all work at that location. $\phi t /$ in



(3) Transformer Cases and Hariware (see Rule 58.3-C3)

RULE 52.7F

## F. GROUNDING

(1) Circuits of 0-7,500 Volts: On wood crossarms, wood poles, or wood structures, hardurare which is less than 3 feet above or 6 feet below unprorected conductors of $0-7,500$ volts shall be nongrounded. Excepted from the requirements of this rule are the following:

Hardware of riser terminals treated as specified in Rule 54.6-F:

Hardware associated with grounded cables and messengers supported on crossams with verrical clearances and pole clearances as specified in Tables 1 and 2 for such eables and messengers; and

Hardware associated with guarded cables and messengers which are treated as specified in Rule S7.4-F.
(2) Circuits of More Than 7.500 Volts: Hardware of circuits of more than 7.500 volts shall be securely and permanently grounded where such hardware can act as a bond between metal patts of the insulating suppors of an energized conductor and of a de-energized portion of the same conductor or of the de-energized portion of another conductor where wouk is to be performed on the de-energized conductor. Such hardware includes the bases of air-break switches and the tanks of oil switches. Bond wires are excepted from this requirement, and are not required to be permanenly grounded.

The permanent grounding specified in this rule will nor be required provided the regular written operating (safery) rules of the utility concemed require that:

Conductors of circuits exceeding 7,500 volts which are deenergized for work thereon shall be securely grounded during all periods of such work; and

When work is to be performed at the location of hardware described in this rule, such hardware shall be temporarily and securely grounded and securely connected to any de-energized conductors involved during all wodk at that location. RULE 53.4
PINS, DEAD ENDS, CONDUCTOR EUSPENSIONS AND EASTENINGS BONDING

Remove work rules covered in CAr/OSHA Title 8

### 53.4 Booding

Bonding is not required by these sules. Bonding is not recommended for circuits of 7,500 volts or less but it is recognized that under certain conditions it may be deemed necessary.

Where bonding is used the bond wire or strap shall have a conductivity of not less than No. 10 AWG copper wire, shall in no case be installed on the rop surface of any crossamm, and the bonding shall comply with the following requirements:

## A. CIRCUITS OF MORE THAN 7,500 VOLTS

(1) Ar Top of Pole:
(a) Single Circuit: The bond wire of a single circuit in horizontal, triangular or vertical configuration at the op circuit position of the pole may be installed on the face, back or under side of wood crossarms and on the surface of pole without a protective covering. Such bond wire on the surface of a wood pole shall be covered by a suitable protective covering (see Rule 22.2) where within 3 feet verieally of the next conductor level below the top eircuit. Crossam braces may be connected to such bond wire only where positive electrical contact is made and the brace is not less than 3 feet vertically above the next conductor level below the top circuit.
(b) More Than One Circuit: The bonding of any circuit where more than one circuit is installed at the top position of : pole shall be in accordance with the provision of Rule 53.4-A. 3 below.
(2) Below Top of Pole: Bond wires of any circuit below the top circuit position of the pole shall be covered by a suitable protective covering (see Rule 22.2) except where such bond wires are installed on the underside of crossarms or where bonds (wires or straps) are installed verically berween crossatms at different levels or between and approximately perpendieular to the individual ams of a double crossam at a distance of not less than 30 inches from center line of pole. Meral braces shall clear such bond wires by not less than $1^{1} 1 / 2$ inches (see Rules) 52.781 and $52.7-\mathrm{C}$ ) and in order to clear braces, an uncovered bond wire carried on the under side of cross arm may be placed on the face or back of a limited porion of crossams and need nor be covered for this limited distance of its run.
NOTE: Revised September 18, 1967 be Decision No. 72984.

# PROPOSED RUTE CHANGE 

RUEE 53.4
53.4 BONDING
A. Circuits of More than 7.500 voles
(1) At Top of Pole:
(2) Below Top of Pole:
(3) Conductors of More than One Circuit at Same Level:
(a) Separateiy Bonded Cineuits: Where conductors of
not more than two circuits are at the same level and separately bonded, such bond wires shall be separeated on the erossam and on surface of pole by not less than 6 inches.



 pox ${ }^{2} /$ /




 znd


NONE: Revised Septerber 28. 2967 by Decision No. 92984.
(b) Hardware Bond Wires: Where work is to be performed at such locations, the crounding of herdware bond wires shall be in accordance with Rule $52.7-F$ (2).

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B. Circuits of 7,500 Volts or Less

The bonding of circuits of 7,500 volts or less shail comply with the following:

Bond wires on wood poles and wood crossams shall be fully covered where practicable by a suitable protective covering;

Bond wires shall be not be less than $12 / 2$ inches from metal braces and all other hardware excopt the metal pins and dead ends which are bonded: and

Bond wire of separate circuits shail be separted on crossarms and poles by not less than 3 inches.

# FINAL * <br> PROPOSED RUTE 

RUTE 53.4

### 53.4 BONDING

A. Circuits of More than 7.500 volts
(2) At Top of pole:
(2) Below top of pole:
(3) Conductors of More than One cireuit at Same Level:
(a) Separately Bonded Circuits: Where conductors of no: more than two circuits are at the same level and separately bonded, such bond wires shall be separated on the crossarm and on surface of pole by not less than 6 inches.

NO"E: Revised September 18. 1967 by Decision No. 92984.
(b) Hardware Bond Wires: Where work is to be performed at such locations, the grounding of hartware bond whres shall be in accordance with Rule 52.7-F (2).
B. Circiits of 7,500 Voles or Less

The bonding of cireuits of 7,500 volts or less shall comply with the following:

Bond wires on wood poles and wood crossarms shall be fully covered where practicable by a suitable protective covering;

Bond wires shall not be less than 1 1/2 inches from metal braces and all other hardware except the metal pins and dead ends which are bonded: and

Bond wire of separate circuits shall be separated on crossams and poles by not less than 3 inches.

ITMM 3

- Rule 5404-A

RATIONATE FOR PROPOSED RULE CEANGE ROLE 54.4-A
CONDTCTOR - CLEARANCES
ABOVE GROUND

Corresponding Rule to Change Rule 37 - Table 1

Due to increased height changes in agricultural equipment and increased electrical contacts with supply lines, minimum conductor to ground clearance requirements should be increased in rural agricultural areas for public safety.

## EXISTING_G.O. 25

### 54.4 Clearances

Allowable variations in clearances due to side swing of suspension insulators, temperature, loading, etc., are given in Rules 37 and 38.

## A. ABOVE GROUND

The minimum vertical clearances shall be those specitied
in Rule 37. Sable 1, with the following modifications:
(I) Across Arid or Mountainous Areas: Across arid or mountainous areas supply circuits carrying $22,500-30,000$ volts, inclusive, may have a clearance of less than 30 Ieet (Table 1, Case 4, Colum F) but not less than 25 feet above ground subject to a reduction of not moze than 20 percent beeause of temperature and loading as specified in Rule 43. Upon special pexmission from chis Commission, a minimum clearance of 25 feet above ground may be applied in similar areas to circuits in excess of 30,000 volts, however, not including class e circuits. For. circuits in excess of 30,000 volts, no reduction of the 25 teet will be pexaitted for conditions less than maximun loadings or temperature specified in Rules 43.1 and 43.2.
(2) In Rural Districts, Conductors of 750-20,000 Volts:
(a) Crossing Roads or Driveways: In zural districts the minimum clearance of 25 feet specified in Table 1. Case 3, Column $E$ may be reduced to 22 wires shall have clearances above ground as specified in Table 1 except as modified by the provisions of Rule 58.3-B2a.
(4) Above Swimming pools: Crossings of conductors above swimming pools shall be avoided where practicable. Unprotected line conductors shall have radial clearances from the top edge of the swimming pool walls and vertical elearances above the highest water level of the pool surface not less than the clearances specified in Table 1, Case 3, Columns D, E, and F.



| 1 | Ibriambal elearance of conductor from buldalings (excerpl yeneralion and zuletalions), brldoes or otinur atructures (ujum will men may work) wioce surli conductor is not attiseliod thereto. (s) (t) | ........... | 3 (1. (u) | 316. | $\begin{aligned} & 3(1) \\ & (w)(v) \end{aligned}$ | 6 16. $(\mathrm{v})$ | 6.6. (v) | 15 (1). (v) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4 | Distance of emuluctor tron center line of pule, whelliere altacined or unillached. <br> (u) (x) (y) | ****..... | $\begin{aligned} & 15 \mathrm{~d} 11 . \\ & (3)(\infty) \end{aligned}$ | $\begin{gathered} \text { 1' lu. } \\ (\text { (w) }(\mathrm{wc}) \end{gathered}$ | 15 ll. <br> (0) (00) (W) | ls or $10 \mathrm{in} .(0)$ (di) (cu) (dj) | $\begin{array}{rl} 1 a & \mathrm{ln} . \\ \text { (w) } \end{array}$ | Not Aryplealhie |
|  | Dishawe: of combuctor from surfoce of pole, erossuth or uther overisad ilne steveture upon which if le supported, providliny it complies with cose 8 above. ( $x$ ) | -***...... | $\begin{aligned} & 3 \ln , \\ & (0 a)(f f) \end{aligned}$ | $\begin{gathered} 3 i n \\ (i n t)(c c)(i, N) \end{gathered}$ | $\begin{gathered} 2111 . \\ (00)^{(40)}(0,0) \end{gathered}$ | $\begin{aligned} & \text { (w) } 3 \text { in. } \\ & (09)(j)) \end{aligned}$ | $1 / 1$ pin spocling shown in Table 2 Case 15. (h) | $1 / 2$ pin spucion shown In Talic Coso 13. (di) |
| $\stackrel{\omega}{0}$ | Rudlal cunturiline elearance of conductor or ridule (wins(luciocl) lroa ron-climbablo atroct Lybltioj or traffle abynol golos or atandarda, linciuling maturns. hrackuti and liuhling flaturet:. | .-......... | $\begin{aligned} & 1 f( \\ &(\infty)(u) \\ &=(r r)(n s) \end{aligned}$ | はll. <br> (1山) (cc) | 3 (6. (00) | C. (6. (np) | 10 51. (491) | 10 11. (11) |
|  | Hulue arsu: mot sultoule [or callloouldm $(t)(w u)(w)(x x)$ | is th. | 456. | . | 1516 | did. | 23) 16 | 25 (1. $24 x)$ |
| : | Hater aruas sultable for sallbouling, surfuca mres of: ( (th)(wr) (w)(vx) |  |  |  |  |  |  |  |
|  | (0) Luras lian 20 acres | 1051. | 1016. | *....* | 1516. | 20 ll. | 2716. | 27 (6. (kx) |
|  | (t) 20 is, 200 seres. | 2616. | 26.62 | *....* | 26.6. | 204. | 3 3 \% | 35 (6. (xk) |
|  | (r) Owne 200 to 2,000 acess | 32 fl . | 3256 | ***** | 32 ta . | 315. | 41 th | 11 (1) (kx) |
|  | (J) Over 2,000 acres | 30. | 3086 | *..... | 30 Cl | 108. | 17 16. | 4) St. (kk) |

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\& L. Supply onys 36.1-12 10,
O 2. Fupuly eables and moseungors ..... 51.1-112 162
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i). Moy w puluced dupendimy on halyth of trolley contect conductuets.1. swapily survico dcoms5.0-C5 130
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b. Simpily sutvica Uroju:
9.8-122
a. Eupuly gure
36.1-1: 1"
4. Cumanlcallon sutvico diops
44.8-C2 2
5. Ccramaicullon guys
 veliselug.
6. Eupply guys

SG:1-A1 1
04.1-AL
 Heromblifaros.


(in) Muy lay ruducad for callwoy algnad cablos undar spachal comblitiong... 01.4-Ah. 9
(is) May iny roduced in rucal aldutrlete.

 and aloiky rowas
A. 1-A20 1
$3.1-\lambda 20$

(1) Nuy wa ruluced for truntermare regulator or copmetilur leadr.

1. Tronalormar leads
$38.3-1 \quad 1$

(1i) Muy in reduced acrusy arld or mountalinows arcas.
2. Supply cornlucturs of moro llan 22,300 volls ........................ $\quad \$ 1.1-\lambda 1$ 1.


## PROPQSED_G.O. 95

54.4 clearamces

Allowable variations in clearances due to side swing of suspension insulators, temperature, loading, etc., are given in Rules 37 and 38.
A. ABOVE GROUND

The minimum vertical clearances shall be those specified
in Rule 37, Table 1 , with the following modifications:
(1) Across Arid or Mountainous Areas: Across arid or mountainous areas supply eireuits carrying 22,500-30,000 volts, inclusive, may have a clearance of less than 30 Leet (Table 2, Case 4, Colum F) but not less than 25 feet above ground subject to a reduction of not more than 10 percent because of temperature and loading as specified in Rule 43. Upon special permission from this Comission, a minimum cleavance of 25 feet above ground may be applied in similar areas to circuits in excess of 30,000 volts, however, not ineluding Class E circuits. For.circuits in excess of 30,000 volts, no reduction of the 25 feet will be permitted for conditions less than maximum loadings or temperature specitied in Rules 43.1 and 43.2.
(2) - InHolter



feet-rbove ground for eondretors-mot-excending-20,000
 Paty


 sperifiedin-






 -









(2) (-3) Lead Hires for Transformers: Iransformer lead wiyes shall have clearances above ground as specified in rable 1 except as modified by the provisions of Rule 58.3-312.
(3) Above Swiming Pools: Note! No change to wording.


|  |  |  |  | HLro | conluctor coxk | yrned |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text {.ser } \\ & \text { in } \end{aligned}$ | Hature of Clearance | ^ <br> Spun wires (other than trolloy span uires) ovarhoad guys and moswengers | 4 <br> Commindention conductors (Including) open varo, cubles and sorvico dropis). supply sorvico drops of $0-150$ volus | trolloy contact, . Lecdar and span uhros, $0-5,000$ volle | 1) <br> Uuply conductors or $0 . \% 50$ volts, and supply coblou troutod as lin Rulo 5 | R Supply Conductors and sumply calles, $750-22,500$ volts | Supphy Conductors and supply csbles, $22.5-300 \mathrm{kv}$ | $G$ <br> Supply Conductors and :auply cable: $300-$ S'JO KV (mn) |
| $\pm$ | (rumplimy anwo tracks of rallroods vhleh transiwrt ur proposo to transport trolght core (max. belight is (t. Gin.) where nol oporated by owercontact viros. (a) (b) (c) (d) | 2514. | 2581 | $221 / 2 \mathrm{Cl}$ | 259. | 20 fl . | 3184. | 31816.10 (k) |
| 1. | Crossingy or paradioling wown tracks of callrimbligerated by overhood trolloys. (b) (c) (d) | 26 56. (0) | $\begin{aligned} & 26[L . \\ & (0)(0)(0) \end{aligned}$ | ! 10 (ii) (i) | $\begin{gathered} 41 \\ (0) \\ (0) \end{gathered}$ | 30 16: (0) | 3181. (9) | 34 it. <br> (D) (kk) |
| 1 | Cressiling or slarg Horoughiares in rurel dietrlete or croxsing tharoughtares In rural dis(ricty (c) (d) | $(\mathrm{J})(\mathrm{k})(11)$ | $\begin{aligned} & 10 \mathrm{tl} \\ & (\mathrm{~g})(\mathrm{I})(\mathrm{m})(\mathrm{L}) \end{aligned}$ | 13 (6. (hal) | 20 16. (11) | $\begin{gathered} 25 \mathrm{Cl} \\ +(0)(11) \end{gathered}$ | 30 (1. <br> (o) (1L) | $\begin{aligned} & 30 \mathrm{It} \\ & \text { (0) }(11)(x) \end{aligned}$ |
| 1 | Howe ground slong thoroughtores in rucal districte or across other areas capable of beling traversed by vehdeles or agriculturad equipmant. | 15 5. (k) | $\begin{aligned} & 15 \mathrm{It} \\ & (n)(n)(p) \end{aligned}$ | 195 | $\frac{19 \mathrm{It}}{46+4}$ | $\begin{array}{r} 2516 \\ -(4)(0) \end{array}$ | $\begin{aligned} & 30 \text { I6. } \\ & (0)(p) \end{aligned}$ | 30 [t. <br> (0) $(x k)$ |
| - | Alowe ground in arcay accosstble to podestrians only. | $7 \mathrm{tl} .$ | $\begin{aligned} & 10 \mathrm{fl} \\ & (\mathrm{~m})(\mathrm{q}) \end{aligned}$ | 1956 | 12 lt . | 17 [. | 2 \% $5 .(0)$ | $\begin{aligned} & 25(1 \\ & (0)(x x) \end{aligned}$ |
| $\bullet$ | Verticul clearance alowe wildilings and beluges for other struetures, which to not ordidorily support conivetors and on which men can walk) excevt gencraling plants of substalions whether alluciked or masitwated. | 88.8 (r) | 0 Sl. (r) | 08. | 016 | 12 ll | 12 ll | 20 (6. (1) |


kUD：PMC：
 ..... 3 ..... 偣－10
1．Suyply diney ..... 5n．1－81 107
2．Cummuicictions Ilnes ..... 01．1－nl 222
16）Elwill in linereasead tor mugply sonductors on suaponston insulators．vinter cortain conditions3）17＝A）Sfeciol clearances are prowided for tralfie stgral equipment50．1－C 165
1）Eiketial ciluarancios are irculded for stroet ightiong equifmunt ..... 50．2－1．f）Naven on trolecy pole throw of 26 soet．Moy be reducod wher－
sultathy protected．
太 1．Supply guys ..... 6．1－112 191
2．Ewphly cublos and muxsomyocs ..... 51．1－112 162
3．Cummundestlon guys ..... 46．1－D2 210

54．0－c5 130
54．0－c5 130
1．Su｜nly wevice drops
1．Su｜nly wevice drops ..... 01．0－05 238

1．Supply cunductora（uxicopt survico drupa） ..... 2A． $1-112210$
2．Crommelicultion condwetors（oxcoph sorvieo drons） 04．1－42 222

1．Trulley conlact and feodor conductor： ..... 74．4－d1 129
2．Troller spmivires ..... r7．1－A 203
i）Kiry we restued for trolley contoct and apan wites in subways．
unnelt：and under bridgos．
i．Trolloy conloct conductors ..... フ1．1－E 201
2．Trolley span vires ..... 77．1－1 203
－1．Crumunicotion celulex and massengery ..... （4）．1－102 210
 mintrancut to private preynerty and over private property．
1．Supply sorvica dropa

$56.1-1$
3．Cunmunication sevelce drops ．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．84．8－c2
1．Commulieation quys
$86.1-1$
（k）May lo roduced along tixuroughtarus where not normaliy accersible to volidelas．
1．Supply yuys ．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．

 Ukirowylifares．
1．Supply nervicu dropu
$9 \mathrm{M}, \mathrm{s}-3 \mathrm{st}$
2．Canmulication yervice dropy
$81.0-\mathrm{cc}$

（i1）Thiy in roducod in rucsd ilfutricts．



－2 Cimmanicallem conductorn olony roods ．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．Di．1－גz

1．Translormer Juads
38．3－4
2．Reyulator or capacitor lomes
O．
（1）May ise roduced acruss intid or mountalnous orces．
1．Supply couductors ot moro than 22,500 volts
3．－4－A2
2．Cummandiation conductors
84．4－A1

## FINAL *

REVISED_6.0. 25

### 54.4 Clearances

Allowable variations in clearances due to side swing of suspension insulators, temperature, loading, etc., are given in Rules 37 and 38.
A. ABOVE GROUND

The minimum vertical clearances shall be those specified
in Rule 37, Table 1, with the following modifications:
(1) Across Arid or Mountainous Areas: Across arid or mountainous areas supply circuits carrying $22,500-30,000$ volts, inclusive, may have a clearance of less than 30 feet (Table 1, Case 4, Column F) but not less than 25 feet above ground subject to a reduction of not more than 10 percent because of temperature and loading as specified in Rule 43. Upon special permission from this Comission, a minimum clearance of 25 feet above ground may be appiied in similar areas to circuits in excess of 30,000 volts, however, not including class E circuits. For-circuits in excess of 30,000 volts, no reduction of the 25 feet will be permitted for conditions less then maximum loadings or temperature specified in Rules 43.1 and 43.2.
(2) Lead Wires for Transformers: Transformer lead wires shall have clearances above ground as specified in Table 1 except as modified by the provisions of Rule 58.3-B1a.
(3) Above swimming pools: Crossings of conductors
above swiming pools shall be avoided where practicable. Unprotected line conductors shall have radial clearances from the top edge of the swimming pool walls and vertical clearamees above the mighest water level of the pool surface not less than the clearances specilied in Table 1, Case 3, Columns D, E, and $F$.

|  |  |  |  | Hiro | －cennluctor cinn | crised |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\cdots$ | Hature of Clearame | a <br> Eghn wiruy （abler thwn trolley apin wirgs） orevhead guys and nespengers | Commulestion conductor： （laclualion） open viec， cibles ami soivico drupus）． supply service drops of 0－150 volun | trolioy continet， โewher amal sjumi virets， $0-5,000$ volte | b <br> Gundy combuctor＇se of 0－150 volts，and supply cablues troalod as in Rula i\％． 0 |  | Euphiy Cumbuctors dind supply cables． 22．5－300 kv | $c$ <br> Supuly Ginviuctora amb sappiy cables 300 － S50 ky（mu） |
| 1 +0 | Cruzilimy alwo trsike of callroode vhlela lrans－ iwrt or promose to transport froloflit ears（max． lielight is（t．Gin．）wiere not oporated by overe <br>  | $2 \mathfrak{L C}$ | 250 | 22．1／2 6 | $2 \%$ | 2016 | 3412 | 31 （5．（kx） |
| － |  <br>  | 26 5．（0） | $\begin{aligned} & 26 \text { (t. } \\ & (0)(\mathrm{r})(\mathrm{J}) \end{aligned}$ | 1リ）r．t． <br> （i）（i） | $\begin{gathered} \text { ch }(1 . \\ (0)(a) \end{gathered}$ | $30 \mathrm{IL}:(2)$ | 34 （6．（9） | 318. <br> （D）（kk） |
| 1 | Civistiong or alomy Ulorowgitaros in rural 山ls－ <br>  （rlets（c）（d） | $\text { (d) } 26(k)(d)$ | (10 [1. | 13 16．（161） | 20 （6．（11） | 255. <br> （o）（11） | 30 rs. <br> （a）（II） | $\begin{aligned} & 3 n s h \\ & (v)(11)(k k) \end{aligned}$ |
| 1 | Nove ground along thoroughtares in tural dis－ tricts or acrons ollier arces capabla of being traversed by vehleles ur agriculturel oqulpmant． | 15 66．（k） | $\begin{aligned} & 15 \mathrm{I} . \\ & (m)(n)(n) \end{aligned}$ | 19 f． | $19 \mathrm{ft}$. | $25 \mathrm{tl} .$ (o) | $\begin{gathered} 30 \\ (0) \\ (0) \end{gathered}$ | 30 ： <br> （0）（ xk ） |
| $\cdot$ | Aluw grownd in areay acceasible to podestrians cuily． | \％ 7 ． | $10(\mathrm{n}$. <br> （m）（1） | 1リ 1＇6． | $12 \%$. | 178. | 25（1．（0） | $\begin{aligned} & 25 \text { fl } \\ & (0)(k k) \end{aligned}$ |
| $\bullet$ | Veritical clearance aldove wildulligs and bridgoz for ulber steuctures，which do not ordinarily support conductors and on wisch men can wadk） exesph prneroting plante or substallons whethar aftivilued ar unathached． | C［t．（c） | O IL．（r） | $4 \Omega$. | 0 Ct． | $125 .$ | 12 t. | 20 St．（13） |

\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline Ihrixumbal cleuranco of conductor fron iulldingas (excepl generatimg and substutions). beldgea or ollier strwitures (uition which men muy work) wiwere suril condiuitor is not athecind thareto. (s) (l) \& ...*-...... \& 3 (1). (4) \& 386 \& \[
\begin{aligned}
\& 3(1 . \\
\& (v)(v)
\end{aligned}
\] \& 6 Cl. \({ }^{\text {(v) }}\) \& 656. (v) \& is (h. (v) \\
\hline Distance of conductor fran center lane of pole, wincllier altiached or unathehed. (w) (x) (y) \& ........... \& \[
\begin{aligned}
\& \text { L5 due } \\
\& \text { (s) (s) }
\end{aligned}
\] \& \[
\begin{gathered}
\text { Lij ln. } \\
(\mathrm{ai})(\mathrm{Lu})(\mathrm{cc})
\end{gathered}
\] \& \begin{tabular}{l}
1515. \\
(o) (00) (0d)
\end{tabular} \& \begin{tabular}{l}
Ls or 18 in. ( 0 ) \\
(du) (ec) (19)
\end{tabular} \& \[
\begin{gathered}
10 \mathrm{dn} . \\
(\mathrm{du})(\mathrm{ec})
\end{gathered}
\] \& Not Appilable \\
\hline Wistincu of conductor fron surtoce of pola, crossarm or ollier overheod 3 ine strueture upon which it la supported, providung it comphies vill Cose © drow. ( \(x\) ) \& ........... \& \[
\begin{gathered}
3 \mathrm{Ln} . \\
(0,0)(r)
\end{gathered}
\] \& \[
\begin{aligned}
\& 3 \text { In. } \\
\& (\mathrm{an})(\mathrm{cc})(\mathrm{yg})
\end{aligned}
\] \& \[
\begin{gathered}
3 \mathrm{ln} . \\
(00)^{(10)}(09)
\end{gathered}
\] \& \[
\begin{aligned}
\& .3 \text { 1n. } \\
\& (\mathrm{s})(08)(j j)
\end{aligned}
\] \& 1/4 pin spucing shown in Towle 2 Cosso 2\%. (W) \& \(1 / 2\) pin spuclog shown in Table Cuso 13. (N) \\
\hline Racllal cunterilne elearance of conductor or cullo (unatlachod) trom noneclumbabla atroot tightime we tratile slijnal polos ar atandarin. inciwilng mictams, brockole and lighting flxtureys. \& --....... \&  \& \begin{tabular}{l}
13) 11. \\
(14) (cc)
\end{tabular} \& 3 16. (o) \& 6 11. (pw) \& 10 (6. (\%1) \& 10 Ct
(12)

$\square$ <br>
\hline Hater aress not sultahlo for solllawing

$$
(t()(w)(w)(x x)
$$ \& 156. \& 158. \& ***** \& 1 L re. \& 17 ct \& 2515 \& 25 (t. (kx) <br>

\hline Muler arcas sultable tor saldbouting, surlace ared of: (ll)(wv)(w)(xa) \& \& \& \& \& \& \& <br>
\hline (0) Le:s suma 20 acres \& 10 ct \& 10 ll \& -*...* \& 10 ft \& 2056 \& 27 [6. \& 27 (1. (kx) <br>
\hline (b) 20 (0 200 scres \& 26 ll \& 2656 \& **... \& 2651 \& 208. \& 3516. \& Is 56. (xk) <br>
\hline (c) Ower 200 to 2,000 acres \& 326. \& 32 fl \& **... \& 32 に. \& 34 fl \& 1186 \& 12 (t. (k) <br>
\hline (d) Ouser 2,000 seres \& 3086. \& 3016. \& -**** \& 3016. \& 10 Cl. \& 178. \& A) (t. (3k) <br>
\hline
\end{tabular}

## 

## NULS: IMG:

not retuced mory than st bocoust of temperatire or lanilimg. ..... 3 ..... $18:$

1. Suyply lines ..... 54.1-41 101
2. Cummuications lines ..... 01.1-n1 222
11) Siwlil in lixiteased tor supply combutiora on suapension insulators under certain condilluns ..... 3) M\%
a) Srectal clearances aro providod lor traffle algnol equipment ..... 50.1-6 110
465
if Eiactal cluarancers are provided lor street 11 ghting apulimunt ..... $50.2-1$ ..... 166
$\Rightarrow$ hasid on trolley pole liriow of 26 foet. May be reduced wiere ..... - sultality protected.
1. Eupply guys
2. Eupply guys ..... 26.9-112 2194 ..... 26.9-112 2194
3. Supply cablos and musernyors ..... 21.1-102 16246.1-122 210
i. Kay we ruluced dupeniliny on hotight of trollor contoct corducture.1. Euyply wevice denpa-4.0-65 130
4. Cimmuliculton sorvicu trops ..... $44.0=00^{2} 230$
1. Siriply cinductora (uxiceph aurvico dropz)34.1-112 110
5. Crumunicullian conductors (oxcopt servico Jrops) ..... $04.7-12222$
olwit bo incruabon wiery reatyht cors ara
14.1-01 2901. Trulley contact and feeder conductors
6. Trolloy spmi wires 'r7.1-A 203
1) Nity iat refluced for trodley contact aind ypan vires in subways,turnulat and under berdges.1. Troiley conluct conductors'71.1-E 201
2. Trolley span vires ..... TT.1-D 203
"1. Gumminiestion cables and messongers ..... U'.1-02 214
 matrances to private prewerty and overe private prosecty.
3. Sugply zorvica dropaz

| Gus |  |
| :---: | :---: |
| 3. Cunmunteation sorvieo Jrops | 84.8-C2 |
| 1.* Cummundeution juys | 86.1 - |

(k) May in reduced along llwayghforves whero not normally uccussiblo to volideles.

1. Eupply yuys $\qquad$
(1) Hay to conduced whore whath 12 fuet of curt 2 dwo of pubise Unurnuglorares.
2. :uppisly survico dropu $\qquad$
[^0]ITEM 4

- Rull $54-4-\mathrm{C4b}$
- Arule 54.4-D6b


# RATIONATE FOR PROPOBED RULE CHANGE <br> RUIE 54.4-C4b CONDUCTOR - CTEARANCES <br> BEYWEEN CONDOCTORS - DEAD EADED ON POLE IN VERTICAL CONPIGURAIION 

It appears the purpose of the existing rule was to provide a margin of safety for woxk being performed in close proximity to unprotected 750-7500 volt conductors.

Present safety requirements necessitate the covering of these unprotected conductors within the working area.

RUTE 54.4-C4B

1. (b) Conductors of More Than 750 voles Supported on Climbable
2. poles: Where conductors of more than 750 volts are supported
3. in vertical eonfiguration diractly on a climbable pole
4. without the use of erossarms at line teminations, angles or
5. corners, the following requirements apply:
6. The vertical separation between conductors of the same 7. circuit shail be not less than the clearances specified in Table 8. 2. Cases 25 and 20 ;
7. The vertical separation of different circuits shall be not less 10. than the clearances specilied in Table 2, Cases 8 to 13 . inciusive; 11. Not more than two conductors of a cireuit of $750-5,000$ volts 12. shall be supported directil on a pole in vertical configuration 13. Without the use of crossarms. The number of conductors of a 14. eircuit of more than 5,000 volts so supported on a pole shall 15. be limited to four. Branch circuits may be taken from such 16. construction without the use of crossarms provided a elimbing 27. and working space as specified in Rule 54.7 and Rule 54.11 18. is maintained: and 19. The clearance of conductors from surface of pole shall be 20. not less than as specified in Rule 54.4 -D6b.
8. See Rule 54.7-A1 and Rule 54.11-F for climbing space 22. requirements for conductors dead ended on poles in vertical 23. configuration.

## PROPOSED RUTE CHANGE

RU゙EE 54.4-G45

1. (b) Conductors of More Than 750 Volts Supported en Climbable
2. Poles: Where conductors of more than 750 volts are supported
3. is vertical configuration directly on a ciimboble pole
4. Without the use of crossarms at line teminations, angles or
5. conners, the following requirements apply:
6. The vertical separation between conductors of the same
7. Circuit shall Soffot not be less than the claarances specified in
8. Table 2. Cases 25 and 20 ;
9. The vertical separation of different circuits shail be/hot not
10. be less thar the clearances specified in Table 2, Cases 8 to 13. 11. inclusive:
11. Not more than $x \not$. four conductors of a circuit of more than 23. 750 f $\$ 6 \varnothing \varnothing \varnothing$ volts shail be suppozted directly on a pole in vertical 24. configuration without the use of crossarms. $2 K \phi / n \min \phi t / \phi 1$

 27. such constraction without the use of crossams provided a elimbing 18. and working space as specified in Rule 54.7 and Rule 54.11 19. is maintained: and
12. The clearance of conductors from surface of pole shall not be 21. Not less than as specified in Rule 54.4-D6b.
13. Soe Rule 54.7-ג1 and Rule 54.11-F for climbing space
14. requirements 10 conductors dead ended on poles in vertical
15. configuration.

FINAL *
PROFCSED RULE CHANGE
RUEE 54.4-C4b
2. (b) Conductors of More Than 750 Volts Supported on Climbable
2. Poles: Where conductors of more than 750 volts are supported
3. in vertical configuration directly on a clinbable pole
4. Without the use of crossams at line teminations, angles or
5. corners, the following regurements appiy:
6. The vertical separation between concuctors of the same
7. circait shail not be less than the clearances specified in
8. Table 2. Cases 25 and 20:
9. The vertical separation of different circuits shall not 10. be less than the clearances specified in Table 2 . Cases 8 to 13. 11. inciusive:
12. Not more than four conductors of a cireuit of more than 13. 750 volts shall be supported directly on a pole in vertical 1*. configuration without the use of crossants. Branch circuits may be 15. taken from such construction without the use of erossarms provided a 16. climbing and woxking space as spacified in Rule 54.7 and Rule 54.1 " 17. is maintained; and
18. The clearance of conductors from surface of pole shail not be 19. not less.than as.specified in. Parle 54-4-06b.
20. See RuIe 54.7-A1 and Ruie 54.11-F Ior climbing space
21. requirements for conductors dead ended on poles in vertical 22. configuration.

```
RATIONAWE FOR PROPOBED RUNE CHANGE
                    RDLE 54.4-D6b
    CONDOCTOR - CLENRANCES
    HROX POEES - DEND ENDED ON POLS
```

It appears the purpose of the existing rule was to provide a margin of safety for work being performed in close proximity to unprotected 750-7500 volt conductors.

Present safety requirements necessitate the covering of these unprotected conductors within the working area.

## EXISTING G.0. 95 RUTE (IINE BY LINE)

RTHE 54.4-D6b

1. (b) More Than 750 Volts Supported on Cimbable Poles:
2. Where conductors are supported on a climbable pole in vertical 3. configuration, the energized portions of such conductors shall 4. have clearances of not less than 15 inches from the surface of 5. the pole for voltages between 750 and 7.500 volts and 18 inches 6. from the surface of pole for voltages in excess of 7.500 volts. 7. Not more than two conductors of a eircuit of 750-5,000 volts 8. shall be attached directiy to a pole in vertieal configuration 9. without the use of crossams. The number of conductors of a 10. Circuit of more than 5.000 volts so supported on a pole shall be 11. Limited to four. Branch circuits may be taken from such 12. construction without the use of crossams provided a climbing and 13. working space as specified in Rules 54.7 and 54.11 is maintained.

RUEE 54.4-D6b

1. (b) More Than 750 Volts Supported on Climbable Poles:
2. Where conductors are supported on a climbable pole in vertical 3. configuration, the energized portions of such conductors shall
3. have clearances of not less than 15 inches from the surface of 5. the pole for voltages between 750 and 7,500 volts and 18 inches
4. from the surface of pole for voltages in excess of 7,500 volts.
5. Not more than tido four conductors of a circuit of more than 8. $750 f \$ 6 \% \phi$ voits shail be atzached directly to a pole in vertical


 12. such construetion without the use of crossarms provided a elimbing 23. and werking space as specified in Rules 54.7 and 54.11 is 14. maintained.
```
FINAL * PROPOSED RULE CHANGE
```

RUTE 54.4-D6b

1. (b) More Than 750 volts Supported on Climbable Poles:
2. Where conductors are supported on a cifmbable pole in vertical
3. configuration, the energized portions of such conductors shall
4. have clearances of not less than 15 inches from the surface of
5. the pole for voltages between 750 and 7.500 volts and 18 inches
6. from the surface of pole for voltages in excess of 7.500 volts.
7. Not more than four conductors of a circuit of more than 750 volts
8. shall be attached directiy to a polé in vertical configuration
9. Without the use of crossarms. Branch circuits may be taken from
10. such construction whout the use of erossarms provided a climbing
11. and working space as specified in Rules 54.7 and 54.11 is
12. maintained.

ITEM 5

- Rule 54.8


## RATIONAIE FOR PROPOSED RULE CEANGE RUTE 54.8 CONDUCTORS BERVICE DROPS, 0-750 VOLT8

This change simplifies existing language, moves building ciearances to rable 20, and puts more emphasis on using Insulated conduetors (particularly when using allowed reduced clearances).
54.8 Serviee Drops. 0-750 Volts

ג. MATERIAL AND SETE
Stppiy serfice drops of 0-750 voles shall be of material and size as specisied iz mabie 8 and Rule 49.4-C7a and shall Mave a wathez-Eesistar. sove=ing at least equivalent to double-braid weather proofing.




## 3. CEARANCES RBOVE GROCND, SUITDENGS, EIC.

He vertifeal clearances of supply sezvice drops above groun. butied=ss. ecc., stall be not less than the mindmin cleamances specified in kixie 37, IabIe q. Colun 日, with the following sodifications:
(1) Above Public Thoroughfares: Service drop conductors stall have a verueal eloarance of not less than 18 ieet above publie Hosorchfarts. except that this clearance may grade from I8 feet at a pesifion not moze than 22 feet horizontally ficm the cirb line to a ciearance of not less than 16 feet at the curb line, provided the Elearance at the ceaterife of any public thoroughfare stall in io ease be less than 18 feot. Wheze there are no curbs the forecotng provistons shall apply using the outer limits of posstble vemiexiam movement is ider of a bine.
(2) Above Private Thoroughfares and other private property:
(a) IEdustrial or Comercial Promises: Over private driveways. lanes, or ofier privase preperty arans accessisle to venicies on premises used for indistrial or comercial purposes. service drops shall have a vertical clearance of not less than 16 Eeet.
(b) Residancial premises: Ovez private driveways or lanes or ethes private propersy araas accessible to vehicles on premise used for fesidental purposes only, service drops shall have a vertical clearance of not less than 12 Ieet. If the buideing served does not permit an attachment which will affere a clearance of at least 12 foet over such areas without the instailation of a stracture on the building to provide addifional height, the vertical clearance of servien drops of 0-300 voles only may be less than 12 feer but shail be maincained as great as posstble and stail be met less that 30 Eet.
(3) Above Grovad an גreas Accessible to Pedestrians Only: (a) Incestrial and Comercial Premises: Over areas aceessibie to peciestmians oniy on premises used for industrial or comercial purposes. service drops shajl be maincadad at a vercisal ciearase of not less than 12 Eeet.
(b) Residential ?Eamises: Cver areas accessibie $=0$ pecestitans only on Eesidancial promises, service drops shal: je maineained at a vercical cleazance of not less than io seet. it the building served does not permit an attachment whech wing aifore at least 20 feet elearamee over such areas without the instaliation of a stzicture on the builiting to p=evide additional height. the vertieal clearance of sextace jreps of $0-300$ voles enly may be Iess than 10 feet but shali be majnained as great as possible and shail be not tess Elar 8 teet 6 anches. If the building served, would requite the instadation of an artachment structure so provide hodght suifidetant to afiord a vertacal clearance of at least 3 zete 6

(4) Frow . Bufidfngs and Stractures: Service duops shall be so armarged as to hamer and endanger worlonan and firaran as lifごe as possible it the performance of their duties.
(a) Industrial and Comercial Premises: on premises used sor industrial and comercial purposes, service drops shaly be maineajned at a vertical clearance of not less chan $a$ feec ove= all or any portions of buildings and structuras. except that serriee drops of 0-750 volts may be less thar $g$ foet, but not less than 12 inches above the metalife or nonnetailic eornice. decosative apondage, eave, roof, or paraper wall of ta building served provided:

The cirfont carrying service conductors are insuiated for the voltage being supplied (see Rule 20.8-G), and the point of attachment of the service drops is not noze than Is inches bacic of the front face of the builateg wail facting the pole line twom which the sezule dees originate.

Sezviee drops are not rectioned to clear buindings any specific horizontal distanee but shail be so instained that Ebey clear ife escapes. exits. windows, doors and over points at which humar contact might be expected. a soxizontal distance of not less than 3 feet.

Where seruice drops cross over merailic os nonmotalile non-walkable overtang or patio cover the veretcal clearance may be less than 8 feet, but not Iess then 24 inches providing such sezvice drops consist of abrasionresistant cables having a grounded moraliic sheet and are fonulated for the voltage being supplied.

(b) Residential Premises: on pramises used for resisencial purposes only. service dreps of $300-750$ volts shall be mafinained at a vertical elearance of not less thar 8 feet over all buildings and structuras.

The elaarane above buindings of service drops of 0-200 roles shail be not less than the distance specified is Ieble 10.

TABTE 20
Minimur Allowable Clearance of Service Dzops of 0-300 Volts Above Buildings


On premises used for residental purposes oniy the ciearance above building of service drops of 0-300 voles may be less than the distance spectifed in Table 10 but not less than :2 inches ovar the building sezved nor less than 24 inctes above other buildings on the premises served, providod:
the current-cariving conductors consist of abrasion=esistane cable havieg a grounded motallse sheati er neutral-supported sezvice drop cable manufactured in accordance with Standard No. WC-5-1961 or Standard No. we-3-1959 of te National Electrac Manufaciuzers Association and are insulated for the volisage being stoplised and che roof is metalise or non-meralite. non-walkable overtang or patio cover.
Sezvice drops are nor requifed to clear butietirgs on =esiceatial premisen any specified herizon=al distance, but swall be so instalied that they clear fine ascapes, exies, windows, doors and other points at which humar cointaet micis be uxpected, a borizoncal edstance of not less rhan 3 feer. Sertice dreps above a horizontal plase through the top extemity of an epening should maineain the maxdim practieal radial ciearanee. wheh $2 n$ no ovent shall be less than 1 foot.


(5) above swiming pools: Inseallations of service drops abeve pulice and private swixming pools shail be avoided where practieabie. Where service drop conductors are instailed above a swimaing poci. the conducsors shall bave a radtal clearance of not less than 20 seer fyom the top edge of the pool walis and shall have a vertical ciee-ance of sot less than 18 feet above the highest water lovel of "ite pool sixace. Service drops having coverings of racerials speciaioy apperved by the Commission for i-stallation above swinming peois may have vertical clearamces above the pool and radial clearances inm the top edge of the pool wall of not less than 16 feer for publis and cenmertaily oparated pools and not less than 12 feer for residental pools.
54.8 Service Drops, 0.750 Voles
A. MATERIAL AND SIZE

Supply service drops of $0-750$ voles shall be of material and size as


B. CLEARANCES ABOVE CROUND. BULIDINGS, ETC.

The vertical clearances of supply service drops above ground. buildings. etc.. shail be not less than the minimum clearances specifled in Rule 37. Table 1, Colum B, with the following modifications:
(1) Above Public thoroughfares: Service drop conductors shall have a vertical clearance of not less than 18 feet above public thoroughfares, except that this clearance may grade from 18 feet at a posicion not more than 12 feet horizontalily from the curb line to a clearance of not less than 16 feet at the curb inne. provided the clearance at the centerline of any public choroughfare shall in no case be less than 18 feet. Where there are no curbs the foregoing provisions shall apply using the outer limits of possible vahiculax movement in liew of a curb inne.
(2) Above Private Thoroughfares and Other Private Property:
(a) Industrial or Comercial Premises: Over private driveways. lanes. or other private property areas accessible to vehicles on premises used for industrial or commercial purposes, service drops shall have a vertical clearance of not less than 16 feet.
(b) Residencial Premises: Over private driveways or lanes or other private property areas accessible to vehicles on premise used for residential purposes only, service drops shall have a






 12 feet. EXCEPTION: This clearape may be reduced for
 10 feet.
(3) Above Ground in Areas Accesaible to Padeatrians Only:


 clearance of not less than 12 feet. EXCEPTION: This clearance may be reduced for insulated services that conform with rule 20.8G to














TsI00p

















- sejanp xyoqu $7 \$$ suswirgeres
















$208747 / 29$




## 















#### Abstract

                    



and July 22, 2066 by becialac No. 74342.
(5) A,bove Sulrming Pools: Installations of service drops above public and private awiming pools shall be avoided where practicable. Where service drop conductors are installed above a swiming pool. the conductors shall have a radial claarance of not less than 20 feet from the top edge of the pool walls and shall have a vertical clear: ance of not lass than 18 fect above the highost water level of the pool surface. Service drops having covering of materials specialiy approved by the Commisifion for installation above swimming pools may have vertical clearances above the pool and radial clearances from the top edge of the pool vall of not lesa than 16 feet for public and comercially operated pools and not less than 12 feot for residential pools.

TABLE 10
Kfntman Aliowable Clearance of Service Drops of 0-750 Voles From Buildings

| Weather-Resist | Insulated |
| :---: | :---: |
| covered conductors | conducters |

(Rule 20.8-6)
0.750 V

## Vextical chearances Above:

1) All portions of buildings ineluding metallic or non-motallic comice. decorative appendage. eaves, roof or parapet wall of the building served.

8*
(a) (b)
2) Metallic or non-metalifc non-walkable overhang or patio cover.

8: (a)(b)
3) Other buildings on the same premises.

8'
$2^{\circ}$
4) Buildings on other promises.

8"
$8^{*}$ (c)

## Herizontal_\& Radial_Clearances:

1) From fire escapes, exctes, windows, and doors.

$$
3^{\circ}
$$

$$
3^{\circ}
$$

(a) No limit specified but the greatest practicable clearance should be obeained.
(b) The point of atcachment of the service drop for industrial and comereial premises is not to be more than 18 inches back of the front face of the building wall facing the pole line from which the service drop originates.
(c) Reduce to 2 feet for non-metallic roof, more than $3 / 8$ pirch (approximately 37 degrees from the horizontal, see sketch)

54.8 Service Drops. 0.750 Voles
A. MATERIAL AND SIZE

Supply sezvice drops of $0-750$ voles shall be of material and size as speciffed in Table 8 and Rule 49.4-C7a.
B. CTEARANCES ABOVE GROUND. BUIIDINGS. ETC.

The vercical clearances of supply service drops above ground, buildings, ecc.. shali be not less than the minimum clearances specified in Rule 37. Iabie 1. Colum B, with the following modifications:
(1) Above Public Thoroughfares: Service drop conductors shall have a verelcal clearance of not less than 18 feet above public thoroughfares, except that this clearance may grade from 18 feet at a position not more than 12 feet horizontally from the curb inne to a clearance of not less than 16 feet at the curb line, provided the clearance th the centerline of any public thoroughfare shall in no case be less than 18 feet. Where there are no curbs the foregoing provislons shall apply using the outer limita of possible vehicular movement in liau of a curb inne.
(2) Above Privace thoroughfares and Other Private Property:
(a) Industrial or Commercial Premises: Over private driveways lanes. or other private property areas accessible to vehicles of premises used for industrial or commercial purposes, service drops shall have a vercical clearance of not less than 26 feet. (b) Residential Premises: Over private driveways or lanes or other private property areas acceasible to vehicles on premise used for residential purposes only, service drops shall have a vertical clearance of not less than 12 feet. EXCEPTION: This clearance may be reduced for insulated services that conform with rule 20.86 to not less than 10 feet.
(3) Above Ground in Areas Accessible to Pedestrians Only:

Over areas accessible to pedestrians only service drops shall be maineained at a vercical clearance of not less chan 12 feet. EXCEPTION: This clearance may be reduced for insulated services that conform with rule 20.8G. to not less than 8 feet 6 inches.
(4) From buildinge and Structures: Service drops shouid be arranged so as not to hamper or endanger workers and firefighters while performing theix duties.
(a) Vertical Clearances: Service drop vereical clearances shall be maineained over all poreions of buildings and structures as required by Table 10.
(b) Horizontal Clearances: Service drops are not required to clear buildings by any specific horizontal distance. EXCEPTION: A horizontal distance of not less than 3 feet should be malneained around fire escapes, exits, windows. or doors.
 by Decialco No. 72904: ad July 22. 1088 8y July 22. 1068 by Deciacen No. 74342.

PROPOSED RULE
(5) [NO CHANGE]

TABLE 10
MKnfmum Allowable Clearance of Service Drops of
0.750 Volts From Buildings
Minimumelearance From Buijefnes Weather-Resistant Insulated Covered conductors conductors

$$
0.750 \mathrm{~V}
$$

(Rule 20.8-6)

## Vexical Clesatances_Abore:

1) All porcions of buildings fncluding metallic or non-meeallic cornice. decorative appendage, eaves. roof or parapet wall of the building served. $8^{\circ}$ (a) (b)
2) Metalifc or non-metallic non-walkable overhang or patio cover.
$8^{*}$
(a) (b)
3) Other buildings on the same premises.
4) Bulldings on other premises.
$8^{\circ}$
8
$8^{\prime}$ (c)

## Horizental \& Radial عlesaxances:

1) From fire escapes, exits, windows. and coors.
3. 
4. 

(a) No ifmit specified but the greatest practicable clearance should be obeained.
(b) The point of accachment of the service drop for industrial and commexcial premises is not to be more than 28 inches back of the front fise of the building wall facing the pole line from which the service drop originates.
(c) Reduce to 2 feet for non-metallie roof, more than $3 / 8$ pitch (approximately 37 degrees from the horizontal, see sketeh)


ITEM 6

- Rule 54.10-D

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RATIONAIE FOR PROPOEED RULE CHANGE ROIE 54.10-D IOW VOLTAGE MOLTICONDOCTOR CABLE WITH BARE NEDTRAL 0-750 FOLEB CONDUCTOR BRACING
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Rule 38. Table 2, Case No. 17, Item D established a 3 inch radial separation for incidental pole wiring for 0-750 volt conductors. This radial separation applies to all types of conductors ineluding bare. It is not necessary to increase this requirement to 6 inches for "Iow Voltage Multiconductor Cable with Bare Neutral, 0-750 Volts". Rule 54.10-C1 requires that "the phase conductors including jumper connections shall be covered with an insulation suitable for the voltage..." providing even a greater safety margin than the 3 inch regnimements of Table 2 by itself.

EXIBTING ROLE<br>ROIE 54.10-D<br>CONDOCTOR BPACING

54.10-D
D. CONDE゙CTOR SPACING

A vertical separation between individual conductors when supported in individual clevises or a multiconductor rack shall be not less than 6 inches.

> PROPOSED ROLE CHRNGE (BIRIN OUT NND UNDERIINED)
> RULE 54-10-D
> CONDUCNOR BPACING

54-10-D

A-verticet-separation-between-individuat-conduetors-when-supported
 than-6-inehes.

PROPOSED RULE CHRNGE<br>(FINRI)<br>RUTE 54-10-D<br>CONDDCTOR BPACING

(EIIminate existing Rule 54.10-D)


ITEM 7

- Rule 54.12

RUSIONAEE FOR PROPOSED RUEE CENNGE RULE 54.12 (NEW RULE)
IOW VOLTAGE EXTENDED RACKS, 0-750 VOLTS

Deviations from General Order 95 which permit the use of extended rack construction were granted in Resolution No. E-1013 on February 9, 1959 and revised by Decision 82-03-020 in 1982. These deviations were granted solely to Pacilic Gas and Electric company. It is proposed to make this type of construction available to all utilities in the State of California. A new Rule 54.12 titled "Low Voltage Extended Racks, 0-750 Volts" will Ee added to General order 95, Section V. Also, a new drawing Fig. 54-9 showing climbing space will be added.

Related rules to Change are: Rule 54.9 nLow Voltage Rack, 0-750 Volts", by adding a reference to new rule 54.12 and inserting a more detailed title; and Rule 54.4-C5, which currently refers te. Rule 54.9, will also refer to the new Rule 54.12.

Ru13 54.22 (new mule)
Rule 54.12 Low Foltage Extanded Racks, 0-750 Folts (Conductors 15 Inches or More From Cantarline of Pole, But Not Less Than 3 Inches From The gurface Of Pole)
A. GENERAI
conductors of 0-750 volts may be attached to poles by means of vertical extended racks of insulators or individual extended supports in vertical rack configuration. Such construction is hereinafter termed "extended rack construction." where extended rack construction is employed, the following rules shall apply.

Note: For Iow Voltage Rack Construction (Conductors Less Than 15 Inches From Centerline of Pole, But Not Less Ihan 2-1/2 Inches From The Surface of Pole) See Rule 54.9.
B. POIE ARRANGEMENT AND CLEARANCE
(1) Clearance From Poles: Conductors in extended rack construction shall have minimum clearances of 15 inches from center jine of pole and 3 inches from the surface of pole as specified in Table 1 , colum $D$, Cases 8 and 9 , respectively.
(2) Conductor hrrangement: Where conductors, both line and service drop, are supported by extended racks, such extended racks may be attached to three sides of a pole (there being 4 sides) at the levels of any extended rack group. Climbing space in conjunction with such attachments shall be maintained as specified in Rule 54.12-F.
C. CONDUCTOR MATERIAI

Al1 conductors of a rack group in the same vertical plane shall be of the same material.
D. CONDUCTOR SPACING AND SPREADER BRACKETS
(1) Vertical separation: The vertical separation between conductors, supported as a group in extended rack construction, shall not be less than 8 inches, such separation to be maintained in a span by suitably insulating spreader brackets attached to such line conductors within the span.
(2) Spreader Brackets: Spreaders shall be used at points in spans where one or more midspan service drops are attached to and supported by the IIne conductorg. Nlso, spreaders shall be so spaced as to limit spans between spreaders or between spreaders and poles to not over 135 feet.

## E. VERTICAL CIEARANCE BETWEEN CONDUCTOR IEVEIS

A vertical clearance shall be maintained between the top conductor supported in the extended rack group at one leved and ennductors supported on the same pole at the next level above as provided in Table 2, Cases 9 to 13 and for lead wires Rule 54.4-C6.

Related Extended Rack Construction and Other Types of Construction: Where conductors supported in extended rack construction are connected to conductors supported on other types of construction (crossarm etc.) climbing space shall be maintained in the same quadrant or on the same side of poie in accordance with climbing space requirements in Rules 54.7, 54.9, 54.10 or 54.12-F whichever is related to the climbing space selected.

## F. CIIMBING SPACE IN EXTENDED RACK CONSTRUCTION

The climbing space in extended rack construction shall be maintained through the level of conductors supported in extended rack construction and for a vertical distance of not less than 4 feet above and below such conductors. The position =t the climbing space through the level of conductors in extended rack construction shall be related to climbing space for conductor levels above and below such extended rack construction in accordance with Rules 54.7, 54.10, 54.11 and 93. The depth of the climbing space shall be measured from the center line of the pole.
(1) Dimensions: The dimensions of the climbing space shall be 30 inches square, and shall be provided on one side of the pole with the extremities of such width equidistant from the center line of pole. On poles on which transformers are pole-bolted in line with primary conductors, a 30 inch square climbing space shall be provided in one quadrant or one one side of the pole (see Fig. 54-9).
(2) With Conductors Dead-anded and on Corner Poles: on poles with the extended rack conductors dead-ended and on corner poles, a 30 inch climbing space shall be provided in one quadrant or on one side of the pole (see Fig. 54-9).
(3) Nllowable climbing space Obstructions: Suitably protected vertical runs or risers and ground wires attached to the surface of the poles, and guys, are allowed in climbing spaces provided that no more than two guys (provided they are separated at the pole by a vertical distance of not more than 18 inches) or one vertical riser, run, or ground wire is installed in any 4 -foot vertical section of climbing space. The terminals or terminal fittings of risers or guns shail not be instalied within elifming spaces.



TANGENT OP ANGLE


SLAER SPAN


tangent of anele


JUNCTION


DEAOENO


DEADEND.

Rule $54.12-F$
Fig. 54-9

RETATED RTLE CHRNGE

Rule 54.4-C5
(5) Rack Construction (see Rule 54.9)

PROPOSED ROLE CHANGE (STRIX OOT NND ONDEREINED)

Rule 54.4-C5
(5) Racx construction (see Ruie 54.9) rxtended Rack construction (see Bule 54.12)
PROPOSED ROLE CRNNGE
(FINXI) *

Rule 54.4-C5
(5) Racx Construction (see Rule 54.9) Extended Rack Construction (see Rule 54.12)

## RELATED ROEE CEANGE

(EXISTING ROLE)
54.9 Low Voltage Racks, 0-750 Volts
A. GENERAL

Conductors of not more than 750 volts may be attached to poles by means of vertical raciss of insulators or individual supports in rack configuration and, where so attached, the Iollowing zales shall apply.

PROPOSED ROIE CENNEE
(BIRIAE OUT NND UNDERLINED)
54.9 Low Voltage Racks, 0-750 Volts CConducters Isss Than 15 Inches From Centerinit of Pole But Not Iess Than 2-1/2 Inches From The surfice of Polel
A. GENERAI

Conductors of not-more-than-750 0-750 volts may be attached to poles by means of vertical racks of insulators or individual supports in vertical rack configuration. andr-where-se aetached Such construction is fereinafter termed "rack eonstruction." where rack eonstruction is employed the Following zules shall apply
Note: For Low Voltace Extended Rack_constinetion Conductions 15 Inches or More From Centerijne of Pole, git Not iess Than 3nfaches From The Sutface of polel See Rule 54.12n

## PROPOSED ROLE CRANGE <br> (TINRI) *

54.9 Low Voltage Racks, 0-750 Volts (Conductors Less 2hen 15 Inches From Centerifne of Pole, But Not Lese what 2-1/2 Inches From The surface of Poles

## A. GENERAI

Conductors of $0-750$ volts may be attached to poles by means of vertical racks of insulators or individual supports in vertical zack conifiguation. Such construction is hereinazter termed "rack construction." where rack construction is employed, the following rules shall apply.
Note: For Low Voltage Extended Rack Construction (Conductors 15 Inches or More From Centeriine of Pole, But Not Zess Than 3 Inches From The Surface of Pole) See Rule 54.12.

ITEM 8

- Rure 56.4-A1
- Rule 56.4-c2, $C 3$
- Rule 56.4-C4
- Rule 56.4-D
- Rule 56.4-F

ROEF 56.4-21
NBOVE GROOND

The proposed Fule change is to simplify and elarify the present language. Changes include re-structuring, re-formatting and minor changes in syntax.

### 56.4 Clenrances

A. ABOVE GROUND
(1) Xeross or Nong public Thoroughinces: Guys over or across public thoroughrares in urban districts shall have a clearance of not less than 18 feet above ground (Table 1 . Case 3. Column $A$ ) except that a clearance of not less than 26 feet is permitted for the portions of guys over that part of the public thoroughiare which is an entrance to or exit fisom industrial or commercial premises; and not less than 14 feet in cases where private residential premises are involved. overhead guys along public thoroughfares may have.clearances. above ground which is not nomally accessible to vehicies, Less than as specified in Table 1 , Column $\lambda$, Cases 3 and 4 (18 feet and 15 feet respectively) but sections of such guys between insulators shall have a clearance of not less that 8 Leet above the ground, and sections of guys between insulators and poles shall have a clearance of not less than 7 feet above ground, and such guys without insulators shall be not less than 7 feet above ground.

```
PROPOBED ROLE CERNGE
(BTRIE OTI NND UNDERIINED)
ROLE 56.4-21
GUY CTPNPNNCES
```


### 56.4 Claarances

A. ABOVE GROUND
(1) ower, Neross or Niong Public Thorougbieres:
(a) Guys over or across public thoroughfares in urban districts shall have a clearance of not less than 28 feet above ground (Table 1, Case 3, Colum $A$ ) $\ldots$ exeepe EXCEPTIONS:

1) thet A clearance of not less than 16 feet is permitted tor the portions of guys over that part of the public thoroughfare which is an entrance to or exit from industrial or commercial premisesta
2) and A clearapee of not less than 24 feet is pernitted for the portions of guys over that part of the public thoreughtare which is an entrance to orexit from in-eases-where private residential premises are-invoived.
(b) overhead guys along public thoroughfares may have clearances, bove ground which is not normally accessible to vehicles, less than as specified in table 1. Column $A$, Cases 3 and 4 ( 18 Leet and 15 feet respectively).
3) but Sections of such guys between insulators shall have a clearance of not less than 8 feet above the groundio
4) and Sections of such guys between insulators and poles shall have a clearance of not less than 7 Leet above the groundTe
5) and Such guys without insulators shali -be- not be less than 7 feet above the ground.
```
PROPOBED RUTE CEANGE
(IMNL) *
ROLE 56.4-21 GUY CIPNPNNCEB
```


## 56.4 elearamces

A. ABOVE GROUND
(1) Over, Nerose or Nlong Fublic Inoroughiares:
(a) Guys over or across public thoroughfares in urban districts shall have a clearance of not less than 18 feet above ground (Table 1 , Case 3, Column A). EXCEPTIONS:

1) A clearance of not less than 26 feet is permitted for the portions of guys over that part of the public thoroughfare which is an entrance to or exit from industrial or commercial premises.
2) $A$ elearance of not less than 14 feet is permitted for the portions of guys over that part of the public thoroughfare which is an entrance to or exit from private residential premises.
(b) overhead guys along public thoroughfares may nave clearances, above ground which is not normally accessible to vehicles, less than as specified in Table 2, Column A, Cases 3 and 4 (18 feet and 15 feet respectively).
3) Sections of such guys between insulators shall have a elearance of not less than 8 feet above the ground.
4) Sections of sueh guys between insulators and poles shall have a clearance of not less than 7 Ieet above the ground.
5) Such guys without insulators shall not be less than 7 feet above the ground.

# RAIIONAFE YOR PROPOSED RDLE CHANGE ROLE 56.4-C2 and 56.4-C3 <br> GOX CLEARANCES <br> 56.4-C2 - ON COIINEAR IINES 56.4-C3 - PARRALEL ON 8NK POLES 

The proposed rule change is to simplify and clarify the present language. Also, add a new drawing (Fig. 56-1) opposite the text for illustration of Rule 56.4-C3.

Rule 56.4-C
C. FROM CONDJCTORS
(2) On Colinear Innes: The radial clearances between guys on a line and conductors on a colinear line shall be not less than as specified in Table 2, case 18. Vertical clearances not less than as specified in Table 2, Case 1, shall aiso be maintained at points of crossing between guys on a line and conductors supported on other poles of a colinear line.
(3) Parallel on same poles: The radial clearances between guys and conductors which are approximately parallel and supported by the same poles shall be not less than as specified in Table 2. Case 18.

## PROPOBED ROEE CHZNGE

(BTRTE OTT NND UNOERIINED) RUTES 56.4-C2 ND ROLE 56.4-C3 GOY CIENRUNCES

Rale 56.4-C

## C. FROM CONDCCIORS

(2) On Colimear Ifnes: The radial clearances between guys on a line and conductors on a colinear line shall -be- not be less than as specified in Table 2, Case 18. Vertical clearances not less than as specified in Table 2 , Case 1 , shail also be maintained at points of crossing between guys on a inne and conductors supported on other poles of a colinear line.
(3) Parallel on Bane Poles: The radial clearances between guys and conductors which are approximately parallel and supported by the same poles shall bem not be less than as specified in Table 2, Case 18. (seefig. 56-1).


Overneed guys, which ore opproximately porallel 10 conductors wopportat on the some poles the guys ars otroched 1o, sholl cleor such conductors by ine following rodiol distomees:

Communicotion Conductors_-a-3
750-20000 wolt Conductors_ $\qquad$ $18^{\circ}$
o-750 Volt Conductort $12^{\circ}$

20000-35000 Voit Conouctors. $30^{\circ}$

Rule 56.4-C3
Fis. 56-1

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PROPO8ED ROLE C:ONGES (FINDI) * RULE 56.4-C2 2ND 56.4-C3 GUY CETNRANCES
```

Rule 56.4-C

## C. FROM CONDUCTORS

(2) On colinear Lines: The radial clearances between guys on a line and conductors on a colinear line shall not be less than as specified in Table 2, Case 18. Vertical clearances not less than as specified in Table 2, Case 1, shall also be maintained at points of crossing between guys on a line and conductors supported on other poles of a colinear line.
(3) parallel on same polest The radial clearances between guys and conductors which are approximately parallel and supported by the same poles shall not be less than as specified in Table 2, Case 18. (see Fig. 56-1)


Overtiead guys, which are approximately parallel 10 conductors supported an the some poles the guys ars etroched 10, shall cisor such conouciors by ine Tollowing rodiol distonces:

Communicotion Conductors. 0-750 volt conductors _-_-12
20000-35000 vols Gonductors
$\qquad$ $18^{\circ}$
$\qquad$ $30^{\circ}$

Rule 56.4-C3
Fis. 56-1

```
RAIIONALE FOR PROROBED RULE CHNNGE
    ROLE 56.4-C4
    GJY CLENPNNCES
    PASBING ON SNNE POTES
```

The proposed rule change is to simplify and clarify the present language. Changes include re-structuring, re-formatting and minor changes in syntax. Also, a drawing is being added oppisite the text for reference and ease of application (Fig. 56-2). The requirement for a suitable guard in the exceptions has been broadened to be included in all of the applications.

## EXIBTING RULE <br> RUTE 56.4-C4 <br> coy cimarances

(4) Passing on 8ame Poles: The radial clearances between guys and conductors supported by or attached to the same poles or crossarms shall be not less than as specilied in Table 2, Case 19 except that the clearance between guys and commanication messenger and/or cable attached directly to surface of pole may be less than the 3 inches specified in Tabie 2, Case 19, Colum C provided: the gly is not a guy in proximity, or all parts of the guy are not less than 6 feet below 0-750-volt supply conductors suppozted on same pole. and a wood guard or equivalent is placed on the messenger and/or cable: also, a guy attached to a pole which supports supply conductors at a distance of not less than 6 feet above commnication messenger and/or cable shall (1) have an insulator placed in the ghy above the commuication messenger and/or cable at a distance of not less than 6 feet horizontaliy from the pole, or (2) have an insulator placed in the guy not less than 3 inches nor more than 6 inches above the messenger and/or cable, and a wood guard or equivalent placed on the messenger and/or cable.

```
PROPO8ED ROLE CEANGE
（BIRIR OUT NND UNDERIINED）
RELE 56．4－C4
GUY CTEARANCES
```

（4）Passing on same Poles：The radial clearances between guys and conductors supported by or attached to the same poles or crossarms shall bee not be less than as specified in Table 2，Case 19．
except－that－the－ciearance－between－guys－and－commani－cation messenger－andfor－cabłe－ateached－direet主y－to－surfeee－of－poze may－be－iess－ehan－ehe－Э－inches－speeified－in－qebłe－z－－ease－ł9－ eotumn－e－providedt－ehe－gay－4s－not－a－guy－in－proximityr－or－à̇ parts－of－ehe－guy－axe－not－Iess－chan－6－feet－bełow－0－750－vołt suppiy－condueters－suppoxted－on－sane－pozer－and－a－wood－guerd－or equivałent－is－płeced－on－the－messengex－andfox－eabiet－aisor－e gry－ateached－te－a－połe－which－supperts－suppły－conductors－at－a distance－of－not－tess－than－6－feet－above－communication messen－ger－andfor－cabłe－shaままーfむf－have－an－insułator－piaced－in the－gyy－above－the－communifeation－messenger－andfor－cabłe－at－a dis－tance－of－noe－łess－than－6－feet－horteoneatiy－from－the－poter өr－‘そう－heve－an－insułater－piaeed－in－the－guy－not－zess－ehan－3 inches－nor－more－than－6－inches－above－the－messenger－andfor cabłeq－and－a－wood－guayd－or－egaivałent－płeeed－on－ehe－messengey andfor－cabまer

EXCEPTION：The clearance between guys and commurication messenger and／or cable attached＿directiy to the surface of a pole may be less than the 3 inches specified in Table 2 ．Case 12．column＿c＿provided：

|  | cable or guy wire to prevent physical centact and resultant mechanical damage；and |
| :---: | :---: |
| （b）The quy is not＿any inmereximity：or |  |
| （c）An insulator in placed in the ouv above the |  |
|  | commuleation megrenger andlor caple at a vertical |
|  | distance of not legs than 8 elect below the suply |
|  | conductor hevel．（ree fich 56－2 $\lambda$ ）－or |
| （d） | All pacts of the guy within a radial distance of 6 |
|  | Leet from the face of pole are 6 feet or mere below |
|  | the 0－750 yolt eupoly condictors supaetted＿on the |
|  | same pole（seerigh 56－2 B）inex |
| (e) | The cuy is attached to a pole which supgots supaly |
|  | conductors that are 6 feet or more above the |
|  | commuication meatencer and／or＿cable．provided； |

Rule 56.4-C4 (continued)

1) An insulator is placed in the guy above the communication messenger and/or cable at a distance of 6 feet or more horizontally from the pole and not less than one foot below the level of the lowest supply conductor, (see Fig, 56-2 C) ios
2) An insulator is placed in the guy 3 to 6 inches above the messenger and/or cable.

In lieu of a porcelain insulator a suitable fiberglass insulating rod or ecovivalent that meets the requirements of Rule 56,8 and extends 6 inches or more above and below the communication messenger and/Or cable may be used (see Fig. 56-2 D).



B

c


Ineulating Rot

D
Tule 56.4-C4
Fig. 56-2

# PROPOSED RUEE CRANGE <br> (TINAL) * <br> RJEF 56.4-C4 <br> GIY CEEARUNCES 

(4) Passing on 8ame Poles: The radial clearances between guys and conductors supported by or attached to the same poles or crossarms shall not be less than as specitied in Table 2, Case 29.

EXCEPTION: The Clearance between guys and communication messenger and/or cable attached directly to the surface of a pole may be less than the 3 inches specified in Table 2, Case 19. Colums C provided:
(a) A suitable guard is placed on the messenger and/or cable or guy wire to.prevent physical contact and resultant mechanical damage: and
(b) The guy is not a guy in proximity; or
(c) An insulator is placed in the guy above the comurication messenger and/or cable at a vertical distance of not less than 8 feet below the supply conductor level. (see Fig. 56-2 A): or
(d) All parts of the guy within a radial distance of 6 feet from the iace of pole are 6 feet or more below the 0-750 volt supply conductors supported on the same pole, (see Fig. 56-2 B): or
(e) The guy is attached to a pole which supports supply conductors that are 6 feet or more above the communication messenger and/or cable, provided:

1) An insulator is placed in the guy above the commuication messenger and/or cable at a distance of 6 feet or more horizontally from the pole and not less than one foot below the level of the lowest supply conductor (see Fig. 56-2 C): or
2) An insulator is placed in the gay 3 to 6 inches above the messenger and/or cable. In lieu of a porcelain insulator a suitable fiberglass insulating rod or equivalent that meats the requiraments of Rule 56.8 and extends 6 inches or more above and below the commication messenger and/or cable may be used (see Fig. 56-2 D).


A


Anchor Guy


Overhead Guy

C


Inaulating Rod
D
Tule 56.4-C4
Fis. 56-2

RATIONREF TOR PROPOBED RULE CEANGE ROLE 56.4-D
GUY CLTMRUNCES
TROM GUY8 OR 8PAN WIRES

The proposed Fule change is to simplify and clarify the present language. Changes includo re-structuring, re-fomatting and minor changes in syntax. Aiso, add reference to Rule 54.7-A3 when two guys are installed in climbing space.
D. FROM GUYS OR SPAN WIRES
(I) Croseing in gpans: Vertical clearances at points of crossing not less than 18 inches as specified in Table 2, Case 1 , colum $\lambda$ and radial clearances of not less than 12 inches shall be maintained between guys or span wires and other guys or span wires which are not attached to the same poles.
(2) Passing and Attached to fame Pole: The radial clearance between different guys, different span wires, or ditferent grys and span wires, attached to the same pole shald be not iess than 3 inches.
(3) Approximately Parallel and xttached to 8ame Poies: (a) Overhead guys or Span Wires: Where two or more overhead guys or two or more span wires are approximately paralled and attached to the same poles, either or both of which poles support supply conductors, such guys or span wires shall have a vertical separation of at least 1 foot between the points of attachment on the pole, or poles, which support the supply conductors. In cases where such separation is not practicable, other means to insure the effectiveness of the guy or span wire insulators shall be employed, but in no case shall the distance between any guy or span wire and the surface of the insulator in any other guy or span wire be less than 3 inches, measured perpendicularly at the insulator. This fule shall not prohibit the contact of such gays or span wires to the came shims. and shall not apply to guys or span wires acting in different directions nor to guys or span wires in which insulators are not required.
(b) Anchor Guys: Where two or more guys attached to a pole supporting supply conductors are attached to the same grounded anchor, ither directly or through the medium of a stub, they shall be separated at the pole by a vertical distance of at least 1 foot, provided any guy Wire shall be not less than 3 inches from the surface of the insulator in any other guy. In lieu of securing this 3-inch minimum separation by means of the 1 -f00t minimum separation of guy attachments at the pole, it shall be afforded by separation of the grounded anchors or by other practicable means which mall insure the minimum clearance of 3 inches. The provisions of this rule do not apply to guys which act in different directions from the pole or to guys attached to grounded metal structures or to grys which do not require insulators.

## D. FROM GUYS OR SPAN WIRES

(1) Crossing in spans: Vertical clearances at points of crossing not less than 28 inches es-mpeexficed-in frable 2, Case 1 , Column $A 1$ and radial clearances of not less than 12 inches shall be maintained between guys or span wires and other guys or span wires which are not attached to the same poles.
(2) Passing and Attached to 8ame Pole: The radial clearance between different guys, different span wires, or different guys and span wires, attached to the same pole shall -be- not be less than 3 inches.
(3) Approximately Parallel and xttached to same Poles:
(a) ovarhead guys or span, wires: where two or more overhead guys or two or more span wires are approximately parallel and attached to the same poles, and either or both of-which poles support supply conductorsi
$(1)$ Such guys or span wires shall have a vertical
separation of at least 1 foot between the points of attachment on the pole, or poles, which support the supply conductors.
(2) In cases where such separation is not practicable, other means to insure the effectiveness of the guy or apan wire insulators shall be employed, but in no case shall the distance between any guy or span wire and the surface of the insulator in any other guy or span wire be less than 3 inches, measured perpendicularly at the insulator.
(3) This rule shail not prohibit the contact of such guys or epan wires to the same shims and shall not apply to guys or span wires acting in different directions nor to grys or epan wires in which insulators are not required.
(4) Where try ouys are installed in_climbing space, also see fule 547-83.
(b) Dnchor cuyss Where two or more guys attached to a pol supporting supply conductors are attached to the same grounded anchor, ither directly or through the medium of a stub:

RuIe 56.4-D (continued)
(1) They shall be separated at the pole by a vertical distance of at least 1 foot, provided any guy wire shall -be- not be less than 3 inches from the surface of the insulator in any other guy.
(2) In lieu of securing this 3-inch minimum separation by means of the l-foot minimum separation of guy attachments at the pole, it shall be afforded by separation of the grounded anchors or by other practicable means which shall insure the minimum clearance of 3 inches.
(3) The provisions of this Fule do not apply to guys which act in different directions from the pole or to guys attached to grounded metal structures or to guys which do not require insulators.
(4) Where two guys are instalikd in elimbing soace. 21so see Rule 54.7-83.
D. FROM GUYS OR SPAN WIRES
(1) crosaing in 8pans: Vertical clearances at points of crossing not less than 28 inches (Table 2, Case 1, Column A) and radial clearances of not less than 12 inches shall be maintained between guys or span wires and other guys or span wires which are not attached to the same poles.
(2) Passing and Xttached to tame Pola: The radial clearance between different guys, different span wires, or different guys and span wires, attached to the same pole shall not be less than 3 inches.
(3) Approximately Parallel and Attached to same Poles:
(a) overhead guys or span Wires: where two or more overhead guys or two or more mpan wires are approximately parallel and attached to the same poles, and either or both poles support supply conductors:
(1) Such guys or span wires shall have a vertical separation of at least 1 foot between the points of attachment on the pole, or poles, which support the supply conductors.
(2) In cases where such separation is not practicable, other means to insure the effectiveness of the guy or span wire insulators shall be employed, but in no case shall the distance between any guy or span wire and the surface of the insulator in any other guy or span wire be less than 3 inches, measured perpendiculariy at the insulator.
(3) This rule shall not prohibit the contact of such guys or span wires to the same shims and shall not apply to guys or span wires acting in different directions nor to guys or span wires in which insulatore are not required.
(4) Where two guys are installed in climbing space, also see Rule 54.7-ג4.
(b) Nechor Guys: Where two or more guys attached to a pole supporting supply conductors are attached to the same grounded anchor, ither diractly or through the medíum of a stub:
(1) They shall be separated at the pole by a vertical distance of at least 1 foot, provided any guy wire shail not be less than 3 inches from the surface of the insulator in any other guy.
(2). In lieu of securing this 3-inch minimum separation by means of the $1-f 00 t$ minimum separation of guy attachments at the pole, it shall be afforded by separation of the grounded anchors or by other practicable means which shall insure the minimun clearance of 3 inches.
(3) The provisions of this rule do not apply to guys which act in different directions from the pole or to guys attached to grounded metal structures or to guys which do not require insulators.
(4) Whera two guys are installed in climbing space, also see Rule 54.7-AS.

RAIIONXIE FOR PROROSED ROLE CEANGE RULE 56.4-F
GUY CLEARUNCES

This proposed rule change simplifies and clarifies the present language.
F. FROM TRANSFORMER CASES

Ald portions of guys 6 inches or more from the surface of poies or crossarms, at the guy attachment, shall be not less than 4 inches from transformer cases and hangers. portions of guys within 6 inches of the surface of poles or crossarms to waich they are attached shall be not less than 1 1/2 inches irom transfomer cases and hangers.

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PROPOSED ROLE CBANGE
(BTRIKE ODT NND ONDERIINED)
RULE 56.4-7
coy cifarances
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## F. FROM TRANSFORMER CASES

All portions of guys 6 inches or more from the surface of poles or crossarms, at the guy's point of attachment, shall -be- not be less than 4 inches from transformer cases and hangers. portions of guys within 6 inches of the surface of poles or crossarms to which they are attached shall -be- not be less than $21 / 2$ inches from transformer cases and hangers.

```
PROPOSED RULE CHANGE
(FINRI)
ROLE 56.4-7
GUY CLEARANCES
```


## F. FROM TRANSFORMER CASES

All portions of guys 6 inches or more from the surface of poles or crossarms, at the guy's point of attachment, shall not be less than 4 inches from transfomer cases and nangers. portions of guys within 6 inches of the surface of poles or crossarms to which they are attached shall not be less than 1 1/2 inches from transformer cases and hangers.


ITEM 9

- Ralle 56.5

Delete last paragraph. Wrapped guys are no longer used by the industry thus making this portion of the rule obsolete and unnecessayy.

## EXIBTING ROLE ROLE 56.5 GUY FABTENTYGS

### 56.5 Festenings

Guy wires shall be protected by the use of guy thimbles or their equivalent where attached to anchor rods or through bolts.

Cedar and other soft wood poles, around which any guy having an ultimate strength of 5,000 pounds or more is wrapped, shall be protected by suitable guy shims. Hooks, lag screws or other equivalent means shall be used where necessary to prevent the guy from slipping along the pole.

# PROPOSED RDLE CHANGE <br> （STRIKE OUT AND UNDERLINED） <br> ROLE 56.5 <br> GOY FABTENINGS 

### 56.5 Fastenings

Guy wires shall be protected by the use of guy thimbles of their equivalent where attached to anchor rods or through bolts．
eeder－and－other－seft－wood－połes－around－whieh－any－guy－having an－attimate－strength－of－5－$\theta \theta \theta$－pounds－or－more－is－wrapped；－sheiま be－protected－by－3甘itab亡e－gay－shims r－Hooks－zag－serews－or－other equivatemt－means－shaiz－be－used－where－neeessary－to－prevent－the gry－from－sixipping－atong－the－połer

## PROPOSED RULE CHANGE <br> (TIKDIL) * <br> ROLE 56.5 <br> GUY TASTENINGS

### 56.5 Fastenings

Guy wires shall be protected by the use of guy thimbles or their equivalent where attached to anchor rods or through bolts.

ITMM 10

- Rulio 56.6-A
- Rulle 56.6-D

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RATIONALE FOR PROPOSED RULE CEANGE RULEB 56.6-A RND 56.6-D REQUIREMENTS FOR SECTIONAIIZING WITE INSULATORS
56.6-R - GUXB IN PROXIMTTY 56.6-D - OUY8 EXPOSED
```

This proposed fule change simplifies the rules format. Also. it is proposed to add related figures from Appendix $G$ to the text opposite the rale numers and change to current numbering sequence (Fig. 56-3 and Fig. 56-4).

At this time it will also be necessary to leave the current App. G, Fig. 45 and Fig. 52 in the appendix because other mules in the order refer to these figures.
A. GUYS IN PROXIMITY TO SUPPIY CONDUCTORS OF LESS THAN 35,500 VoIIS (see Rule 21.3-D for definition of proximity and App. G. Fig - 45)

All portions of guys within both a vertical distance of 8 feet from the level of supply conductors of less than 35,500 volts and a radial distance of 6 feet from the surface of wood poles or structures shall not be grounded, through anchors or otherwise. Where necessary to avoid the grounding ot such portions, guys shall be sectionalized by means of insulators installed at locations as specified in Rule 56.7. NOTE: Revised March 29, 1966 by Decision No. 70489 : August 9. 1966 by Decision No. 71094 and November 20, 2979 by Decision No. 91030.
D. GUYS EXPOSED TO 22,500 VOITS OR MORE

Guys exposed to conductors of 22,500 volts or more shall not be sectionalized and shall be securely grounded (by means of ground wires, anchor guys, or attachments to securely grounded metal poles of structuxes). Excepted from the above reguirements are:

Guys, all or any portions thereof, which are required to be sectionalized in accordance with Ruie 5.6.6-A because of proximity of wood poles and supply conductors of less than 22,500 volts or in accordance with Rule 56.6-B; and

Guys which are sectionalized by wood strain insulators equipped with arcing horns and designed to provide impulse insulation for lightning conditions or, glass fiber noninterlocking strain insulators which are designei to provide impulse insulation for ijghtning conditions. NOTE: Revised June 8, 2959 by Resolution No. E-1030; March 29, 2966 by Decision No. 70489; August 9, 1966 by Decision No. 71094 and January 6, 1968 by Decision No. 73455.

PROPOSED ROLE CHANGE (STRIEE ODT NND UNDERIENED)

RULES 56.6-A NND 56.6-D
REQUIREMENIS FOR EECTIONAIIZING WITY INSUINTORS
A. GUYS IN PROXIMITY TO SUPPIY CONDUCTORS OF LESS THAN 35,500 VOITS (see Rule 21.3-D for definition of "proximity" and Aрр:- 6 -

A11 portions of guys within both a vertical distance of $g$ feet from the level of supply conductors of less than 35,500 volts and a Fadial distance of 6 feet $f$ rom the surface of wood poles or structures shall not be grounded, through anchors or otherwise. Where necessary to avoid the grounding of such poxtions, guys shall be sectionalized by means of insulators installed at locations as specified in Rule 56.7. NOTE: Revised March 29, 1966 by Deefsion No. 70489 ; August 9. 1966 by Decision No. 71094 and Noverber 20. 1979 by Decision No. 91030.
D. GUYS EXPOSED TO 22,500 VOLIS OR MORE Lsee Bule 21,3-C EOE detinition of "exposed" and Eig. 56-4i

Guys exposed to conductors of 22,500 volts or more shall not be sectionalized and shall be securely grounded (by means of ground wires, anchor guys, or attachments to securely grounded metal poles or structures).
Exeepted EXCEPTED Irom the above reqnixements are:
(1) Guys, all or any portions thereot, which are required
to be sectionalized in accordance with Rule 56.6-A because of proximity of wood poles and supply conductors of less. than 22,500 volts or in accordance with Rule 56.6-B: and (2) Guys which are sectionalized by wood strain insulators equipped with arcing horns and designed to provide impulse insulation for ilghtning conditions or, glass fiber noninterlocking strain insulators which are designed to provide impulse insulation for lightning conditions.

NOIE: Revised June 8, 1959 by Resolution No. E-1030: March 29, 2966 by Decision No. 70489 ; August 9, 1966 by Decision No. 71094 and January 6, 1968 by Decision No. 73455.


Rules 21.3-D, 56.6-ג and 6.6
719. 56-3


## GUYS EXPOBED TO EOPPLY CONDUCTORS OT XORE THWN 22,500 VOLTE OR IM PROIIMCITY OF BUPPLY CONDDCTORS MORE THEN 35,000 VOLSE

moles 21.3-C, 56.5-D and e6.6-C
rig. 56-4

```
PROPOSED ROLE CEANGE
(FINA工) *
ROTF. 56.6-A 2ND 56.6-D
REQOIREMENTS YOR EECTIONRLI2ING WITH INSUIXTORS
```

A. GEYS IN PROXIMITY TO SUPPLY CONDUCTORS OF LESS THAN 35.500 VOITS (see Rule 21.3-D for definition of "proximity" and Fig. 56-3)

All portions of guys within both a vertical distance of 8 feet Irom the level of supply conductors of less than 35,500 volts and a radial distance of 6 feet from the surface of wood poles or structures shall not be grounded, through anchors or otherwise. Where necessary to avoid the grounding of such portions, guys shall be sectionalized by means of insulators installed at locations as specified in Rule 56.7.

NOTE: Revised March 29. 1966 by Decision No. 70489 : August 9, 1966 by Decision No. 71094 and November 20. 1979 by Decision No. 91030.
D. GUYS EXPOSED TO 22,500 VOLTS OR MORE (see Rule 21.3-C for definition of "exposed" and Fig. 56-4)

Guys exposed to conductors of 22,500 volts or more shall not be sectionalized and shall be securely grounded (by means of ground wizes, anchor guys, or attachments to securely grounded metal poles or structures).
EXCEPTED Irom the above requirements are:
(1) Guys, all or any portions thereof, which are required to be sectionalized in accordance with Rule $56.6-\mathrm{A}$ because of proximity of wood poles and supply conductors of less than 22.500 volts or in accordance with Rule 56.6-B; and
(2) Guys which are sectionalized by wood strain insulators equipped with arcing horns and designed to provide impulse insulation for lightning conditions or, glass fiber noninterlocking strain insulators which are designed to provide impulse insulation for lightning conditions.

NOTE: Revised Jume 8, 1959 by Resolution No. E-1030: March 29, 1966 by Decision No. 70489: August 9, 1966 by Decision No. 71094 and Januajy 6, 2968 by Decision No. 73455.


RuIes.21.3-D, 56.6-2 and 86.6
Fig. 56-3


## GUYB EXPOSED TO EUPPLY CONDOCTORS OF YORE TEAN 22,500 VOLTE OR TM PROXIMTYY OF EOPPRY COMDECIORS MORE TERN 35,000 VOLIS

xaies 21.3-C, 56.5-D and 86.6-C
7ig. 36m

ITEM 11

- Rule 56.7-A
- Role 56.7-B
- Rule 56.7-C

6UY8
LOCATION OF BECTIONAII2ING INSTLATORS
OVEREPND GUYB

The proposed rule change is to simplify and clarify the present language. Also, relocate related Iigures Irom Appendix $G$ to the text opposite the rule number and change to current numbering sequence (Fig. 56-5, Fig. 56-6 and Fig. 56-7).

## 入. OVERHEAD GUY8

Insulators installed in overhead guys to sectionalize such guys as required by any portion of kule 56.6 shall be located at a distance of not less than 6 feet and not more than 9 feet, measured along the guys, from the points of attachment of the guys to poles, crossarms or structures (see App. G, Fig. 46). In such overhead guys which are less than 27 feet in length with no seetion grounded, insulation at one location, approximately equidistant from each support will be sufficient.
overhead guys attached to wood poles, crossarms or structures and to grounded anchor guys or metal poles shall be sectionalized at not less than one location, 6 to 9 feet (measured along the guys) from the attachment at the wood pole, crossarm or structure (see App. G. Fig. 46).

Branched guys sometimes referred to as bridle guys which are attached at two or more positions to the same crossam or pole line structure, and which are recuired under the provisions of Rule 56.6 to be sectionalized, shall be sectionalized by means of insulators in the main guy and all branches except one, so that no two branches of such a guy constitute a continuous metallic path between separate points of attachment to crossarms or structures (see App. G, Fig. 50). In conforming with these requirements, insulators in branches of guys should be placed as far as practicable from attachments at pole or crossarm but not more than 9 feet there-from.

AII insulators in overhead guys shall be not less than 8 feet vertically above the ground.

# PROPOBED ROLE CHANGE <br> (BTRIRE OUT NND DNDEREINED) <br> ROLE 56.7-入 <br> LOCATION OF BECTIONALIEING INSULATORS 

## A. OVERHEAD GUY8

Insulators installed in overhead guys to sectionalize such guys as required by any portion of Rule 56.6 shall be located at distance of not less than 6 feet and not more than 9 feet, measured along the giys, from the points of attachment of the guys to poles, crossarms or structures (see Appr-6f-Fige-46 Eia 56-5 and Fige 56-6).

In such overhead guys which are less than 17 leet in length with no section grounded, insulation at one location, approximately equidistant from each support will be sufficient.
overhead grys attached to wood poles, crossarms or structures and to grounded anchor guys or metal poles shall be sectionalized at not less than one location, 6 to 9 leet (measured along the guys) from the attachment at the wood pole, crossarm or structure (see Appr-67-Figt--46 Eig. 56-5 and_Eic. 56-6).

Branched guys sometimes-referred-to-as fbridie guysl which are attached at two or more positions to the same crossarm or pole line structure, and which are required under the provisions of Rule 56.6 to be sectionalized, shall be sectionalized by means of insulators in the main guy and ali branches except one, so that no two branches of such a guy constitute a continuous metalilic path between separate points of attachment to crossarms or structures (see Appr-6f-Figr-5 Eig. 56-7). In conforming with these requirements, insulators in branches of guys should be placed as far as practicable from attachments at pole or crossarm but not more than 9 feet there-from.

All insulators in overhead guys shall be net-zess-then 8 feet or more verticaliy above the ground.


SEETIONALIZATION OF OVENHENO GUYS
On SUPPLY LINES
MULE \$8.7-A
F18. 56-5


SECTIOMALItATIOK OF OYthKLAD BUY
ON JOINTLT USEP POLE

Fig. 56-6


SECTIONALIZATION OF
ARL GUYS AND BRANCHED GUYS
RULE SE.7-A
Fig. 56-7

# PROPOBED RULE CHANGE <br> (FIMEI) * <br> RULE 56.7-2 <br> LOCRTION OF BECFIONRLIEING INBUEATORB 

## ג. OVERHEAD GUYs

Insulators installed in overhead gays to sectionalize such guys as required by any portion of rule 56.6 shall be located at a distance of not less than 6 feet and not more than 9 feet, measured along the guys, from the points of attachment of the guys to poles, crossaims or etructures (see Fig. 56-5 and fig. 56-6).

In such overhead guys which are less than 17 feet in length with no section grounded, insulation at one location, approximately equidistant from each support will be sufficient.

Overhead guys attached to wood poles, crossarms or structures and to grounded anchor guys or metal poles shall be sectionalized at not less than one location, 6 to 9 feet (measured along the guys) from the attachment at the wood pole, crossarm or structure (see Fig. 56-5 and Fig. 56-6).

Branched guys (bridle guys) which are attached at two or more positions to the same crossarm or pole line structure, and which are required under the provisions of Rule 56.6 to be sectionalized, shall be sectionalized by means of insulators in the main guy and all branches except one, so that no two branches of such a guy constitute a continuous metaliic path between separate foints of attachment to crossarms or structures (see Fig. 56-7). In conforming with these requirements, insulators in branches of grys should be placed as far as practicable from attachments at pole or crossarm but not more than 9 feet there-from.

All insulators in overhead guys shall be 8 feet or more verticalily above the ground.


# SECTIOMALIZATION OF OVERHEAD EUYS <br> ON SUPPLY LINES <br> muLE s4.7-A 

F1g. 56-5

sectionalization of oviantad euts On solktly usto poles
muses Ex.7-A amb 0..7.a
Fig. 56-6


# RATIONALE FOR PROPOEED RULE CHANGE RULE 56.7-B <br> GOY8 <br> LOCATION OF SECTIONALIEING INEOLATORS RNCHOR GOY8 

This proposed rale change simplifies and clarifies the present language. Changes include re-structuring, re-formatting and minor changes in syntax. Also, it is proposed to add related figures from Appendix $G$ to the text opposite the rule number and change to current numbering sequence (Fig. 56-8 and Fig. 56-9). At this time it will also be necessary to leave the current App. G, Fig. 49 and Fig. 51 in the appendix because other rules in the order refer to these figures.

EIISTING RULE
ROLE 56.7-B
LOCATION OF BECTIONALIZING INEDTATORS

## B. NNCHOR GUYB

An insulator shall be installed in each anchor guy which is required to be sectionalized by Rule 56.6-A or 56.6-B. so that such insulator is located not less than 8 feet above the ground and ejther 8 feet below the level of the lowest supply conductor of not less than 6 feet from surface of pole and not less than one foot below the level of the lowest supply conductor (see App. G, Fig. 49). These sectionalizing regnirements for anchor guys ean normally be met by insulation at one location: however, short guys or other conditions may require insulation at two locations, one location being not Iess than 8 feet above the ground and the other location either not less than 8 feet below the lowest supply conductor or not less than 6 feet horizontally from pole and not less than one Ioot below the level of the lowest supply conductor. In order to prevent trees, buildings, messengers, metal-sheathed cables or other similar objects ifom grounding portions of guys above guy insulators, it'is suggested that anchor guys be sectionalized, where practicable, near the highest level permitted by this rule.

Ungrounded portions of anchor guys which pass through a level of communcation conductors at positions other than between pole pin positions or outside of the outer pin position shall be sectionalized by insulators placed reither less than 6 inches nor more than 18 inches above the level of the communication conduetors (see App. G, Fig. 49b).

Any anchor guy which enters the ground less than 8 feet below the lowest level of supply conductors on the pole or structure shall be treated as an overhead guy which is grounded by means of a grounded anchor guy or metal polo.

A grounded horizontal brace of a "sidewalk" guy shal2 in no case be less than 8 feet below the level of the lowest unprotected supply conductoz on the same pole (see App. G, Fig. 51b) .

## PROPOSED RDLE CBNNGE (8TRIKE OUT AND UNDERIINED) ROLE 56.7-B LOCAIION OF SECTIONRIIEING INSULATORS

## B. ANCROR GJYS

An insulator shall be installed in each anchor guy which is required to be sectionalized by Rule 56.6-A or 56.6-B, so that such insulator is located not-̇ess-tham-8-feet-above-the-ground
 conductor-or-not-łess--than-6-feet-fyom-surface-of-poze-and-not まess-than-one-foot-bełow-ehe-łevet-of-the-łowest-suppły cenductor-tsee-Appr-67-Figr-49t :

```
(1) 8 reet or more above the aroundi and
(2) 8 feet of more below the level of the lowest supply
    cenductor: or 6 ceet or more from surface-of pole and
    ene foot or more below the level of the lowest supgly
    fonductor,
(see Eic, 56-8).
```

These sectionalizing requirements for anchor guys can nomally be met by insulation at one location; however, short guys or other conditions may require insulation at two locations-:
(a) One location being not-łess-thar 8 feet or more above the groundi and
(b) The other location either not-łess-thar $\&$ feet or more below the lowest supply conductory or not-iess thar 6 feet or more horizontally from surface of pole and not-fess-than one foot or more below the level of the lowest supply conductor.

In order to prevent trees, buildings, messengers, metal-sheathed cables or other similar objects from grounding portions of guys above guy insulators, it is suggested that anchor ghys be sectionalized, where practicable, near the highest level permitted by this rule.

Ungrounded portions of anchor guys which pass through a level of communication conductors at positions other than between the pole and pole pin positions or outside of the outer pin position shall be sectionalized by insulators placed neither tess-ehan-6-inches-nor-more-than ketween 6 and 18 inches above the level of the commaication conductors (see Appr--6f-Figr 49 b Eig. 56-9).

Any anchor guy which enters the ground less than 8 feet below the lowest level of aupply conductors on the pole or structure shall be treated as an overhead guy which is grounded by means of a grounded anchor gry or metal pole.

A grounded horizontal brace of a "sidewalk" guy shall in no case be less than 8 feet below the level of the lowest unprotected supply conductor on the same pole (see Appr-6;-Fige 5ib Eig_56-9).


SECTIONALIZATION OF AMOHOR CUTS
Rule 56.7-B
Fig. 56-8


# PROPOSED ROLE CHANGE <br> (FINAL) * <br> ROLE 56.7-B <br> LOCRTION OP GECTIONAEIZINO INSOLNTORB 

## B. ANCHOR GUYS

An insulator shall be installed in each anchor guy which is required to be sectionalized by Rule 56.6-A or 56.6-B, so that such insulator is located:
(1) 8 feet or more above the ground; and
(2) 8 feet or more below the level of the lowest supply conductor: or feet or more from surface of pole and one foot or more below the level of the lowest supply conductor.
(see Fig. 56-8)
These sectionalizing requirements for anchor guys can normally be met by insulation at one location; however, short guys or other conditions may require insulation at two locations:
(a) One location being 8 Ieet or more above the ground: and
(b) The other location either 8 feet or more below the lowest supply conductor; or 6 feet or more horizontally from surface of pole and one foot or more below the level of the lowest supply conductor.
In order to prevent trees, buildings, messengers, metal-sheathed cables or other similar objects from grounding portions of guys above guy insulators, it is suggested that anchor guys be sectionalized, where practicable, near the highest level pezmitted by this zule.

Ungrounded portions of anchor guys which pass through a level of commanication conductors at positions other than between the pole and pole pin positions or outside of the outer pin position shall be sectionalized by insulators placed between 6 and 18 inches above the level of the commanication conductors (see Fig. 56-9).

Any anchor guy which enters the ground less than 8 Ieet below the lowest level of supply conductors on the pole or structure shall be treated as an overhead guy which is grounded by means of a grounded anchor guy or metal pole.

A grounded horizontal brace of a "sidewalk" gay shall in no case be less than 8 feet below the level of the lowest unprotected supply conductor on the same pole (see Fig 56-9).


SECTIOKALIZATION OF ANOHOR GUTS
Ruje 56.7-B
Fig. 56-8


Rule 56.7-B


RATIONAEE TOR PROPOEED ROLE CRNNGE ROLE 56.7-C

COY8
LOEATION OF 8ECTIONLIZINO INBULKTORS
TRU8S GUY8

The proposed rale change is to simplify and clarify the present language with minor changes in syntax. Niso, relocate related Iigure 105 Appendix $G$ to the text opposite the rale number and change to owrent numbering sequence (Fig. 56-10).

## 2IIBTING ROIE

JOCATION OF BECTIOXDIIZING INBUINTORS

## C. TRDES GUY8

An insulator shall be installed in each truss guy which is required to be sectionalized by Rule $56.6-\mathrm{A}$, so that such insulator is located not less than 8 feet above the ground and not less than 8 feet below the level of the lowest supply conductor passing within 8 feet of the guy (see App. G, Fig. 51). These requirements can nomally be met by insulation at one position: however, in certain unusual conditions the two 8 -foot distances may overlap, in which case insulation will be necessary at two positions.

```
            PROPOSED RULE CHONGE
    (8IRIME OUT NND UNDERIINED)
                                    RULE 56.7-C
LOGNTION OF BECTIONRIIZING INSULNTORS
```


## C. TRDSS GOYS

An insulator shall be installed in each truss guy which is required to be sectionalized by Rule $56.6-\mathrm{A}$, so that such insulator is located not-Iess-than- $\theta-f e e t-a b o v e-t h e-g r o a n d-a n d ~$ not-iess-than- $\theta$-feet-betow 8 feet or more_above the ground and 8 feet or more below the level of the lowest supply conductor passing within 8 feet of the guy (see Appr-67-Figr--5i gig. 56-10). These requirements can normally be met by insulation at one position; howaver, in certain unusual conditions the two 8-foot distances may overlap, in which case insulation will be necessary at two positions.


BEcryomertarion or EIDINRTK GUYS ND greose cuxs
sules 56.7-2 and 56.7-C
7Ig. 56-10
(FINRI)
RULE 56.7-C
LOCATION OF BECTIONAITEING INBOLRTORS
C. TROS8 GUY8

An insulator shall be installed in each truss guy which is reģized to be sectionalized by Rule 56.6-A, so that such insulator is located 8 feet or more above the ground and 8 feet or more below the level of the lowest supply conductor passing within 8 feet of the guy (see Fig. 56-20). These requirements can normally be met by insulation at one position: however, in certain unusual conditions the two 8-foot distances may overiap, in which case insulation will be necessary at two positions.


BECTIOMETENTION OF BIDIWRT GOY: 2N0 2ROES GUY:

Jules 56.7-2 and 56.7-C
719. 56-10

ITEM 12

- Ralo 56.8-A
- Rulle 56.8-C


## RAFIONREE FOR PROPOSED RUIE CEANGE RUTE 56.8-2 GUYB MATERIAI

The proposed File change will update authorized guy insulator material to inciude fibersiass (guy strain polymer insulators).

```
EXISTING ROLE
    ROTE 56.8-\lambda
        GOYS
```

ג. yargerai
Insulators used in ghys on supply Iines shall be porcelain, giass or other suitable material.

PROPOSED RUZE CEANGE<br>(BTRITE OTT AND ONOERIINED) ROLE 56.8-A<br>GUY8

A. MATERIAI

Insulators used in gays on supply lines shali be porcelain, glass, fibercless or other suitable material.

```
PROPOSED RUIE CHANGE
                                    (FINAL) *
    ROLE 56.8-A.
        GJX8
```


## A. MATERTAT

Insulators used in guys on stpply lines shall be porcelain, slass, fiberglass or other suitabie material.

```
RATIONALE FOR PROPOSED RDLE CEANGE
                    RUTE 56.8-C
    GUY INSOJATORS
    FOLTAGE REQUIREMENGE
```

This proposed rule change will bring references to testing standards up to date by referring to the current American National Standard Test Methods for Electrical Power Insulators (ANSI C29.1).

## EXISTING ROTE

RULE 56.8-C
GUY INSOLATORS

## C. FOLTAGE REQUIREMENTS

Insulators used in guys on supply lines shall be so designed that their dry Ilashover voltage is not more than $75 \%$ of the puncture voltage at operating Irequencies.

Insulators used in guys on supply lines shall have a dry flashover voltage not less than as specified in Table 13 when tested in accordance with the Standards (No. 41 , March 1930) of the American Institute of Electrical Engineers under the maximum mechanical loadings specified by this order for the guy construction involved.

## c. VOLTAGE REQUTREMENTS

Insulators used in guys on suppiy lines shall be so. desigred that their dry flashover voltage is not more than $75 \%$ of the puncture voleage at operating frequencies.

Insulators used in guys on supply lines shall have a dry flashover voltage not less than as specified in Table 13 when tested in accordance

 the maximum mechanical loadings specified by this order for the guy construceion involved.
(FINAL) *
RUTE 56.8-C
GUY INSULATORS

## c. Voltage requirements

Insulators used in guys on supply lines shall be so designed that theit diy flashover voleage is not more than $75 \%$ of the puncture voltage at operaeing frequencles.

Insulacors used in guys on supply lines shall have a dry flashover voltage not less than as specified in Table 13 when tested in accordance with the American National Standard (ANSI C.29.1-1982) under the maximum mechanical loadings specified by chis Order for the guy construction involved.

## CORRESPONDING RULE TO CHANGE GUY8 <br> PROPOEED ROLE CHANGE

## RUIE 38

TNBLE 2 (Page 52 - 55)
Case No. 18, Colum C - Delete (bb)
Case No. 19, Colum C - Add (bb)
(Page 55)
References to Rules Modifylng Kinimum Clearancen in Table 2
Existing Referance (bb):
(bb) May be reduced for guys and communication conductors supported on the same pole:

2. Commnication................................................................. 240

Proposed Change to Reference (bb):
(bb) May be zeduced for guys and commancation conductors suppozted on the same pole:

1. Supply...............................................56.4-C4 155


## RATIONALE EOR CHRNGE

## ROLE 38

There are no exceptions to Table 2, Case 18, column $C$ in Rule 56.4-C Page 254, as referenced in (bb).

There are exceptions to Table 2, Case 19 , Column $C$ in Rule 56.4-c4 Page 155 as referenced in (bb).

ITEM 13

- Rule 57.4-A
- R77e 57.4-B2
- RuIe 57.4-F
- Rale 57.4-


# RATIONATE FOR RROPOSED RTLE CHANGE ROLE 57.4-ג <br> YESEENGERS XND INSTIATED CNBLES CIENRNNCES - RBOVE GROOND 

The proposed zule change provides specific related rules to reference for applicable clearance reguirements and clarifies the intent of the existing rule.

Ruie 57; MESSENGERS AND INSULATED CABLES
Rule 57.4, Clearances

Ru10 57.4-入
A. ABOVE GROUND (see Rule 54.4-A)

> PROPOSED ROLE CHANGE
> (ETRIKE ODT NND UNDERIINED)

Ruie 57.4-A
A. ABOVE GROUND tsee-Reae-54r4-At
(2) Yessencers and Insulatied cablen: The pasifeciearances specified in Rule 37 Telele 10 erendueters, as modilied by provisions of Rule 54,4-A are applicable to messengers and insuletert cables (see Bule 57.8)
(2) Grounded and Bonded Kessercers and rnsulated caphes: the kasie elearances specified in Bule 37 , Table i, colunn D are_applicable to greunder_eables having metallic sheaths. and to effectively crounded messengers (see_Rule 57, 8).

## PROPOSED ROLE CENNGE (rIMaL)

Rule 57.4-ג
A. ABOVE GROUND
(1) Messengers and Insulated Cables: The basic clearances specified in Rule 37, Table 1 Ior conductors, as modified by provisions of Rule 54.4-A, are applicable to messengers and insulated cables (see Rule 57.8).
(2) Grounded and Bonded jessengers and Insulated cables: The basic clearances specified in Rule 37, Table 1 , Column D, are applicable to grounded cables having metallic sheaths. and to effectively grounded messengers (see Rule 57.8).

```
RATIONRIE FOR PROPOBED ROLE CERNGE
ROLE 57.4-B2
YESSENGERS RND INSULMTED CABIES CIEARANCES - スROVE RAI工WAYS AND TROILEY IINES
```

The proposed rule change is to simplify and clarify the present language. The addition of a statement that will permit the use of modern suitable material in place of wood. The suitable material must meet the same electrical and mechanical requirements of the existing zule.

## EIISTING ROLE

Ruie 57.4-B Clearances, ABOVE RAIIKAYS AND TROLIEY LINES

Rule 57-4-82
(2) Operated by overbead Trolley: The clearances specified in Table 2 , Case 2 , Colums $A$ and $D$ are based upon a maximum trolley pole throw of 26 feet.

Messengers, and cables, which are bonded and grounded as specilied in Rule 57.8, may have clearances above the rails or runaing surfaces used by troliey cars or coaches less than the distance specilied in Table 2, Case 2, Colums A and D for trolley-thyow ciearance, provided the messengers and cables are not less than 4 feet above the trolley contact conductor and are encased in wood boxing or moulding $7 / 8$ inch or more in thickness for distances of at least 2 feet horizontally from the vertical plane through each trolley contact conductor.

## PROPOSED RULE CHANGE (STRIKE OOT AND UNDERIINED)

Rule 57.4-82
(2) Operated by overbeac Trolley: The clearances specified in Table 1 , Case 2 , Colums $A$ and $D$ 26 feet and 27 feet respectiveiy are based upon a maximum troliey pole threw of 26 feet the usual maximum height of a free trolley poie sbove the top of rails or surface of streets used oy trediey esiss or sesches.

EXCERTION: Messengers, and cables, which are bonded and grounded as specified in Rule 57.8, may have clearances above the rails or rumaing surfaces af streets used by trolley cars or coaches less than the distance specified in Table 1 , case 2. Colums $A$ and $D$ for trolley-throw clearance, provided the messengers and cables are not less than 4 leet above the trolley contact conductor and are encased in wood boxing or moulding with a minimum thickness of $7 / 8$ inch or-more-in thiekness for other suitablematerial having the same minimum electrical insulating gualities and mechenical strengthl for distances of at least 2 feet horizontally from the vertical plane through each trolley contact conductor.

## PROPOSED RULE CHONGE (YINAI)

RuIe 57.4-82
(2) Operated by overbead Trollay: The clearances specilied in Table 1, Case 2, Colums $A$ and D, 26 feet and 27 feet respectively, are based upon a maximum trolley pole throw of 26 feet, the usual maximum height of a free trolley pole above the top of rails or surface of streets used by trolley cars or coaches.

EXCEPTION: Messengers, and cables, which are bonded and grounded as specified in Rule 57.8 , may have clearances above the rails or surface of streets used by trolley cars or eoaches less than the distance specified in Table 1, Case 2, Columns A and D for trolley-throw clearance, provided the messengers and cables are not less than 4 feet above the trolley contact conductor and are encased in wood boxing or moulding with a minimum thickness of $7 / 8$ inch (or other suitable material having the same minimum electrical insulating qualities and mechanical strength for distances of at least 2 feet horizontally from the vertical plane through each trolley contact conductor.

# RATIONALE FOR PROPOSED RULE CHANGE <br> ROLE 57.4-F <br> MESSENGERS AND INSTLATED CXBLES CIEARANCES - FROM POLES, CROSSARMS AND OTKER CONDUCTORS 

The proposed ruie change is to simplify and clarify the present language. Changes include re-structuring, re-fomatting and minor changes in syntax. Also, appropriate Figures from Appendix "G" will be brought forward and inserted into the text of the rule.

## EXIETING RULE

Rule 57.4 Clearances

Rule 57.4-F
F. FROM POIES, CROSSARMS AND OTHER CONDUCTORS

Kessengers, and metal sheathed cables, which are bonded and grounded as specified in Rule 57.8 shall have elearances not jess than the minimum clearances required for conductors of 0-750 volts with all of the following provisions being appicicable:

Such grounded messengers and cables may be attached to the surfaces of poles or wood crossamm at less than the clearance specified in Table 1, Column D, Cases 8 and 9. When attached to pole or wood crossarm at less than 15 inches from center line of pole such grounded messenger or cable shall be not less than 4 feet vertically above or 6 feet vertically below any unprotected supply conductor except that where a guard arm (or arms) is placed above messenger and cable as specified in Rule 57.7, the clearance of 6 feet may be reduced to not less than 4 leet below unprotected conductors of 0-750 volts (see App. G, Fig. 53):

Such grounded messenser and cable when supported on the same crossama with unprotected conductors in excess of 750 volts shall be placed on the side of pole opposite the unprotected conductors (see App. G, Fig. 54):

Such grounded messenger and cable when supported on the same arm with unprotected conductors of 0-750 volts, shall be placed at not less than pin spacing (Table 2, Case 15, Column D) beyond the outermost unprotected conductor on the same side of pole (see App. G, Fig. 54):

The ciearances required in this Rule 57.4-F between a cable and unprotected conductors shall not be held to apply between a grounded cable (and its messenger) and unprotected conductors of the same circuit on poles where unprotected conductors enter (or leave) a cable. On such poles no grounded section of messenger or cable shall be less than 15 inches from surface of pole: and

Where two or more cables are attached to the surface of the same wood pole in accordance with the provisions of this Rule 57.4-F, they shall be placed on the same side of pole when their vertical separation is less than 8 feet but in no case shall the vertical separation be less than 1 foot.

## PROPOSED ROLE CHANGE (STRRIKE OUT AND UNDERIINED)

RuIe 57.4-F
F. FROM POLES, CROSSARMS AND OTHER CONDUCTORS

Messengers, and metal sheathed cables, which are bonded and grounded as specified in Rule 57.8 shall have clearances not less than the minimull clearances required for conductors of 0-750 volts with all of the following provisions being applicable:
(1) Attached to Surfaces of poles and crosgㅛㅇㅕㅐㅇㅗ: Such grounded messengers and cables may be attached to the surfaces of poles or wood crossamis at less than the clearance specilied in Table 1 , Column D, Cases 8 and 9. when attached to pole or vood crossarm at less than 25 inches from center line of pole such grounded messenger or cable shall -be-not- not be less than 4 feet verticalily above or 6 feet vertically below any unprotected supply conductor except that where a guard arm (or arms) is placed above messenger and cable as specified in Rule 57.7, the clearance of 6 feet may be reduced to not less than 4 feet below unprotected conductors of 0-750 volts tsee-Appr-Gf-Figr-53tt Ssee_Eig. 57-2_A)
(2) Supported_en Same_crossana Above 750 Volts: Such grounded messenger and cable when supported on the same erossurn with unprotected conductors in excess of 750 volts shall be placed on the side of pole opposite the unprotected conductors tsee-Appr-67-Figr-54tt (see Fig. 57-2 B).
(3) Supported on Exame Crossanm 0-750 Volts: Such grounded messenger and cable when supported on the same arm gressanm with unprotected conductors of 0-750 volts, shall be placed at not less than pin spacing (Table 2, Case 25, Column D) beyond the outermost unprotected conductor on the same side of pole tsee-Appr-67-Fig:-54tt (see_Eig. 57-1_ C)
(4) Between caple and पnprotested conductors; The clearances required-in-this-Rate-57-4-F between a cable and unprotected conductors shall not be held to apply between a grounded cable (and its messenger) and unprotected conductors of the same circuit on poles where unprotected conductors enter (or leave) a cable. On such poles no grounded section of messenger or cable shall be less than 15 inches from surface of pole
(5) Two or More cables Attached to the Gurface of pole: Where two or more cables are attached to the suriace of the same wood pole in-aecordance-with-the-provisions-of-this-Ruze 57.4-F7 they shall be placed on the same side of pole when their vertieal separation is less than 8 feet but in no case shall the vertical separation be less than 1 foot.


Rule 57.4-F
Fig. 57-1
F. FROM POIES, CROSSARMS AND OTHER CONDUCTORS

Messengers, and metal sheathed cables, which are bonded and grounded as specified in Rule 57.8 shall have clearances not less than the minimum clearances required for conductors of $0-750$ volts with all of the following provisions being appдicable:
(1) Attached to Surfaces of Poles and Crossarms: Such grounded messengers and cables may be attached to the surfaces of poles or crossams at less than the clearance specified in Table 1, Column $D$, Cases 8 and 9 . When attached to pole or crossarm at less than 15 inches $f$ from center line of pole such grounded messenger or cable shail not be less than 4 feet vertically above or 6 feet vertically below any unprotected supply conductor except that where a guard arm (or arms) is placed above messenger and cable as specified in Rule 57.7, the clearance of 6 teet may be reduced to not less than 4 leet below umprotected conductors of 0-750 volts (see Fig. 57-1 A).
(2) Eupported on same Crossaril גbove 750 Volts: Such grounded messenger and cable when supported on the same crossarm with unprotected conductors in excess of 750 volts shall be placed on the side of pole opposite the unprotected conductors (see Fig. 57-1 B).
(3) Supported on same Crossarm 0-750 Volts: Such grounded messenger and cable when supported on the same crossarm with unprotected conductors of 0-750 volts, shald be placed at not less than pin spacing (Table 2, Case 25, Column D) beyond the outemost unprotected conductor on the same side of pole (see Fig. 57-1 C).
(4) Between Cable and Onprotected Conductors: The clearances between a cable and unprotected conductors shall not be held to apply between a grounded cable (and its messenger) and unprotected conductors of the same circuit on poles where unprotected conductors enter (or leave) a cable. On such poles no grounded section of messenger or cable shall be less than 15 inches from surface of pole.
(5) Two or Yore Cables Xttachad to the surface of poie: Where two or more cables are attached to the surface of:the same wood pole they shall be placed on the same side of pole when their vertical separation is less than 8 feet but in no case shall the vertical separation be less than 1 foot.


Rule 5.7.4-F
Fig:.57-1

RATIONN工E FOR PROPOSED RULE CEANGE ROLE 57.4-G
MESSENGERS NND INSUTATED CABLES CIEARANCEE - YROM BUILDINGS NND OTHER STRDCTURES

The proposed fule change is to simplify and clarify the present language.

RuIe 57.4 Claarances
RUIe 57.4-G, FROM BOIIDINGS גND OTHER 8TRUCTURES
G. FROM BUIIDINGS AND OTHER STRUCTURES

Messengers, and metal sheathed cables, which are bonded and grounded as specified in Rule 57.8 are not required to clear buildings and other structures any specified horizontal distance and the clearance specilied in Table 2, Case 7, Column D does not apply in such instances. Such cables, and messengers, shall be installed so that they do not interfere with the free use of lire escapes, exits, etc., and shall be so arranged as to hamper and endanger workmen and firemen as little as possible in the performance of their duties.

PROPOSED RULE CHANGE
(STRIXE ODT AND TNDERIINED)

Rule 57.4 Clearances
RuIe 57.4-G, FROM BDIIDINGS AND OTHER STROCTDRES
G. FROM BUIIDINGS AND OTHER STRUCTURES

Messengers, and metal sheathed cables, which are bonded and grounded as specified in Rule 57.8 are not required to elear buildings and other structures any spesified horizontal distance and the clearance specified in Table 1 , Case 7, column D does not apply in such instances. Such cables, and messengers, shall be installed so that they do not interfere with the free use of fire escapes, exits, etc., and shetz-be-so arranged-as-to-hamper-and-endanger-workmen-and-firemen-as まitete-as-possibie-in-the-performance-of-their-dutiest shound be arranaed so as not to hamper or endangex workers and firefighters while perforning their duties.

## PROPOSED ROLE CHANGE (PINAI) *

Rule 57.4 Clearamees
Rule 57.4-G, PROM BUIIDINGS AND OTHER BTRDCTORES
G. FROM BUIEDINGS AND OTHER STRUCTURES

Kessengers, and metal sheathed cables, which are bonded and grounded as specified in Rule 57.8 are not required to clear buildings and other structures any specified horizontal distance and the clearance specified in Table 2 , Case 7, Column D does not apply in such instances. Such cables, and messengers, shall be installed so that they do not interfere with the free use of fire escapes, exits, etc., and should be arranged so as not to hamper or endanger workers and firefighters while performing their duties.

ITEM 14

- Rone 57.5
- Rale 57.7


## RATIONAIE FOR PROPOSED RULE CEANGE <br> RULE 57.5 <br> MESSENGERS AND INSTLATED CABLES <br> FASTENINES

Delete the last paragraph. Wrapped guys are no longer used by the industry thus making this portion of the rule obsolete and unnecessary.

## Rule 57．5 Fastenings

Harcware used in connection with messengers shall meet the strength requirements of Rule 49．7－C．Dead－end attachments used on messengers or reinforced cables shall have a strength not less than that of the messenger or reinforced cable．

Cedar and other soft－wood poles around which any messenger having an ultimate strensth of 5，000 pounds or more is wrapped shall be protected by suitable shims．Hooks，lag screws，or other equivalent means to prevent the messenger from siipping along the pole shall be provided where necessary．

## PROPOSED RULE CHANGE （STRIKE ODT AND UNDEREINED）

RuIe 57．5 Fastemings
Hardware used in connection with messengers shall meet the strength Ieçirements of Rule 49．7－C．Dead－end attachments used on messengers or feinforced cables shall have a strength not less than that of the messengez or reinforced cable．

Eedex－and－other－soft－wood－pozes－azound－which－any－messengez heving－an－甘もtimate－serengeh－ot－5－$\theta \theta \theta$－poandiv－oy－more－is－wreppes
 other－eçiveえent－means－te－prevent－ehe－messenger－\＆rom－síipping a主omg－the－poze－shał̇－be－provided－where－neeessary

## PROPOSED RDIE CEANGE <br> （FINAL）＊

Rule 57.5 Fastenings
Hardware used in connection with messengers shall meet the strength requirements of Rule 49．7－C．Dead－end attachments used on messengers or reinforced cables shall have a strength not less than that of the messenger or reinforced cable．

## RATIONALE FOR PROPOSED ROLE CEANGE <br> ROLE 57.7 <br> MESSENGERS AND INSULATED CABLES JSE OF GסARD גRMS גND COVERINGS

Delete the the reference to "of wood" under the requirements for suitabie protective covering. Insert a reference to Rule 22.2 which contains the definition and requirements for suitable protective covering.

RuIe 57.7 Tse of Guard Nrms und Coverings
Any guard arm which is reguired to be installed by the provisions of Rule 57.4-F shall be at least 4 feet in length (Rule 20.9-D) and parallel to and not more than 4 inches above the top of the cable or messenger. In lieu of the guasd arm, suitable protective covering of wood at least 4 feet in length may be placed around the cable and messengex.

Doubie guard arms shall be used where such a messenger or cable is deadended on or wrapped around a wood pole, at a vertical separation of less than 6 feet below unprotected supply conductors of other circuits of 750 volts or less. portions of cables which take the form of a riser or a grounded lateral or vertical run shall be covered as specified in Rule 54.6-E for risers.

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PROPOEED RDLE CEINGE (SIRIXE OTI RND ONDERIINED)
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RuIe 57.7 Use of Guard $\lambda$ fims and coverings
Any guard arim which is required to be instalaed by the provisions of Rule 57.4-F shall be at least 4 feet in length (Rule 20.9-D) and parallel to and not more than 4 inches above the top of the cable or messenger. In 2 iev of the guard arm, suitable protective covering of-wood (Bule 22,2) at least 4 feet in length may be placed around the cable and messenger.

Double guard arms shall be used where such a messenger or cable is deadended on or wrapped around a wood pole, at a vertical separation of less than 6 feet below unprotected supply conductors of other circuits of 750 volts or less. Portions of cables which take the form of a riser or a grounded lateral or vertical run shali be covered as specified in Rule $54.6-E$ for risers.

## PROPOSED RULE CHRNGE <br> (PINAI)

## fule 57.7 Use of Guard $\lambda$ gms and Coverings

Any quard arm which is required to be installed by the provisions of Rule 57.4-F shall be at least 4 feet in length (Rule 20.9-D) and parallel to and not more than 4 inches above the top of the cable or messenger. In lieu of the guard arm, suitable protective covering (Rule 22.2) at least 4 feet in lensth may be placed around the cable and messenger.

Double guard arms shall be used where such a messenger or cable is deadended on or wrapped around a wood pole, at a vertical separation of less than 6 feet below unprotected supply conductors of other circuits of 750 volts or less. portions of cables which take the form of a riser or a grounded lateral or vertical ran shall be covered as specified in Rule $54.6-E$ for risers.

ITEM 15

- Rule 59.3-A
- Rule 59.3-F

RATIONALE TOR PROPOSED RULE CHANGE
ROLE 59.3-A
COMYON RRIMARY NND EECONDARY GROUNDED NEUTRAL EYSTEMS
CONDOCTORS - MRTERIAI

The proposed rule change deletes the requirement that "Related phase and neutrai iine conductors shall be of the same materiai, except that the neutral conductor may be of copper". This zequifement mandates expensive and unneeessary conductor changes and modifications during re-construction projects (such as a major cut-over from 12kv to 21kv with a common neutral). Accepted and sound engineering practices throughout the industry dictate the most efficient and economical use of specific conductor types. This proposed rule change will not diminish safety to the workmen and general publie, or service reliability, but will significantly reduce unnecessary eosts to the rate payez.

## EXISTING ROLE

RuIe 59, Common Primary and Secondary Grounded Neutral Systems
Rule 59.3 Conductors
59.3 Conductors
A. MATERIAL

Conductors of common neutral systems shall be of copper, copper-covered steel, bronze, stranded composites of any of the foregoing, aluminum, aluminum cable steel reinforced, of of other corfosion-resisting metal, but shali not be of galvanized ixor or steel.

Related phase and neutral line conductors shall be of the same material, except that the neutral conductor may be of copper.

PROPOSED RULE CERNGE
(STRIKE OTT RND UNDERIINED)

### 59.3 Comductoss

A. MATERIAI

Concuetors of common neutral systems shall be of copper, copper-covered steel, bronze, stranded composites of any of the foregoing, aluminum, aluminum cable steel reinforced, or of other corrosion-resisting metal, but shall not be of galvanized jron or steel.

Retated-phese-and-neutrez-i̇ne-conduceors-shetz-be-o£-ehe same-meterízー-exeept-that-the-neutrez-conduetor-may-be-of eopper:

## PROPOSED RULE CBNNGE <br> (FINRI) *

### 59.3 Conductors

A. MATERIAL

Conductors of comon neutral systems shall be of copper, copper-covered steel, bronze, stranded composites of any of the foregoing, aluminum, aluminum cable steel reinforced, or of other corrosion-resisting metal, but shall not be of galvanized iron or steel.

## RATIONAIE

RULE 59.3-P - DESIGNATION OF COMYON NETTRAL
The present ruie requires the placement of a metal tag on any common neutral conductor that is located in the primary pin position as the only means of marking said conductor.

The proposed rule change will allow marking of the comon neutral with any weather- and corrosion-resisting material if specific conditions are met. Also, optional marking locations on the crossazm or surface of pole are proposed.

ROLE 59.3-F
F. DEEIGNATION OP COMPON NEDTRAI

In comon neutral systems, where the common neutral line conductor is installed in a primary pin position, it shall be designated by an approved noncorrosive metal tag having a minimum diameter of not less than 1 inch upon which shall be permanentiy imprinted the letters "CN" not less than $5 / 16$ inch in height. Said tag shall be attached securely to and maintained on the comon neutral conductor at each pin position of line arm and buek azm at a distance not more than 12 inches from the face of the crossarm on the climbing side of each pole and so installed as to be clearly visible at all times.

PROPOSED RUTE CHANGE (STRIKE OUT AND UNDERIINED)

RUIE 59.3-F
F. DESIGNATION OF COMMON NEUTRAI

In comon neutral systems, where the comon neutral line conduetor is installed in a primary pin position, it shall be designated by-an-approved-noneorrosive at each_pin_pesition with the letters "ON", A weather- and corrosion-resistion materigl shaid be uset and the letters shall be clearly legible.

Optionad_marising methods are:
2. A metel tag having a minimum diameter of not less than 1 inch upon which shall be pemanently imprinted the letters "CN" not less than 5/16 inch in height. Said tas shall be attached securely to and maintained on the common neutral conductor at each-pin-positeion-of-íine-arm and-buek-arm-at a distance not more than 12 inches from the fece-of-the-crossam-on-the-eitmbing-side-of-eech poie-and-so-instał̇ed-as-to-be-ełearły-visibまe-et-à̇ times: surfice of the
2. Solid letters not less than 3 inches in beight or sign spewing the letters "GN" oet less than 3 inches in peight solid er with letters eut out thereirom. said detters or sicns shall be placed on the face of a crossafm suitable ior attaching the letters or signs, directly begeath the eqmmen neutral suppert or sajid Letters or signs shall be placed on the surface of the pele beneath the eommen neutral support.

## PROPOSED RUTE CHANGE

(FINAI) *

RUTE 59.3-7
7. DESIGNATION OF COMMON NEUTRAE

In common neutral systems, where the common neutral line conduetor is installed in a primary pin position, it shall be designated at each pin position with the letters "cN". A weather- and corrosion-resitting material shall be used and the letters shall be clearly legible.

Optional marking methods are:

1. A tag having a minimum diameter of not less than 1 inch upon which shald be permanently imprinted the letters "CN" not less than 5/26 inch in height. Said tas shall be attached securely to and maintained on the common neutral conductor at a distance not more than 12 inches from the surface of the conductor support.
2. Solid letters not less than 3 inches in height or a sign showing the letters "CN" not less than 3 inches in height, solid or with letters cut out therefrom. said letters of signs shall be placed on the face of a crossarm, suitable for attaching the letters or signs, directly beneath the common neutral support, of said letters or signs shall be placed on the surface of the pole beneath the comon neutral support.

ITEM 16

- Rule 74.4-E
- Rule 77.4-B

RAIIONALE FOR PROPOSED RUNE CAANGE ROLE 74.4-E
REROUTREAENTS POR TROITEY ITNES CONDOCTOR - CWEARANCES - ONDER BRIDGES, EIC.

This proposed rule change adds language to include overhead clearance reduction for light rail systems operating within exclusive and semi-exclusive rights-of-way as defined by General Order 143-A, Safety Rules and Requlations Governing Light-Rail Transit_

## EXISIING ROLE

RULE 74.4-E
E. UNDER BRIDGES, ETC.

A reduction of the clearances given in table 2 to a minimum of 14 feet for trolley contact conductors is permitted for subways, tunnels ox bridges, provided the railway does not operate freight cars where the vertical distance from the top of car or load to trolley contact conductor is less than 6 feet, except that for light rail transit systems, the minimum height shall be that set forth in General Order No. 243, "Rules fox the Design, Construction and operation of Light Rail muansit Systems Including Streetcar operations." This will require the grading of the trolley contact conductor from the prescribed construction down to the reduced elevation (see App. G, Fig. 64).

No clearance is specified between the trolley contact conductor and the structure. Where the structure is of material which will ground the trolley current in the event the collector leaves the contact conductor, a properly insulated trolley trough or equivalent protection shall be installed to prevent contact between the collector and the structure. Where pantograph collectors are used, this protection is not required. See Rule 54.4-I for provisions applicable to conductors other than trolley contact conductors.

Note: Modified June 27, 1978 by Decision No. 89022.

PROPOSED RUTE CAANGE (STRTKE ODT AND ONDERIINED)

RULE 74.4-E
E. UNDER BRIDGES, ETC.

A reduction of the clearances given in Table 1 to a minimum of 14 feet for trolley contact conductors is permitted for subways, tunnels or bridges, and for $0-750$ volt conductors within exclusive and semi-exclusive rigbts-of-way as dedined by Alignment classifications 2.04-a. and 9. $04-\mathrm{b}$. (1) centained in General order No, 143-A, "Safety Rules and Requlations Governina Light-Raid reansit", provided the railway does not operate freight cars where the vertical distance from the top of car or load to trolley contact conductor is less than 6. feet. $T$ ewept that for ligitt rail tromoit syotems, the mimimum height sheit be-that-set forth int Generat onder Nor 14\}, "futes for the besigr, Conotruption and operation of bight Rail Mransit Syotems Inetuing-Streetcar Operations." This will require the grading of the trolley contact conductor from the prescribed construction down to the reduced elevation (see Appo 6, fige 64 Eig. 74-1).

No clearance is specified between the trolley contact conductor and the structure. Where the structure is of material which will ground the trolley current in the event the collector leaves the contact conductor, a properiy insulated trolley trough or equivalent protection shall be installed to prevent contact between the collector and the structure. Where pantosraph collectors are used, this protection is not required. See Rule 54.4-I for provisions applicable to conductors other than trolley contact conductors.

Note: Modified June 27, 1978 by Decision No. 89022.


RUTE 74.4-E
FIG. 74-1

## PINAI ROLE CEANGE *

RUSE 74.4-E
E. UNDER BRIDGES, ETC.

A reduction of the clearances given in Table 1 to a minimum of 14 feet for trolley contact conductors is permitted for subways, tunnels or bridges, and for $0-750$ volt conductors within exclusive and semi-exclusive rights-of-way as defined by Aligmment Classifications 9.04-a. and 9.04-b.(1) contained in General order No. 143-A, "Safety Rules and Regulations Governing Light-Rail Transit", provided the railway does not operate freight cars where the vertical distance from the top of car or load to trolley contact conductor is less than 6 feet. This will require the grading of the trolley contact conductor ixom the prescribed construction down to the reduced elevation (see Fig. 74-1).

No clearance is specified between the trolley contact conductor and the structure. Where the structure is of material which will ground the trolley current in the event the collector leaves the contact conductor, a properly insulated trolley trough or equivalent protection shall be instalied to prevent contact between the collector and the structure. Where pantograph collectors are used, this protection is not required. See Rule 54.4-I for provisions applicable to conductors other than trolley contact conductors.

Note: Modified June 27, 1978 by Decision No. 89022.


RULE 74.4-E
FIG. 74-1

## REIATED ROLE CEANGE

TABLE 1 - CASE 2 - COIUN C - REFERENCE 5 EXIETING ROLE
(i) May be reduced for trolley contact and span wizes in subways, tunnels and under bridges.

PROPOSED RULE CHANGE
CBTRIE OUT RND UNDERUINED
(i) May be reduced for trolley contact and span wires in subways, tunnels, and under bridgest and inefenced areas.

## PROPOSED RUZE CHANGE

 (FINAI)(i) May be reduced for trolley contact and span wires in subways, tunnels, under bridges and in fenced areas.

RATIONAIE FOR PROPOSED RUTE CGANGE ROLE 77.4-B REQUTREMIENTS FOR TROLITEX ITNES
SPAN WIREES, BACKBONRS, MESSENGERS, EIC. - CLEARANCES UNDER BRIDGES, EEIC.

This proposed rule change adds language to include overhead clearance reduction for light rail systems operating within exclusive and semi-exclusive rights-ot-way as delined by General order 143-A, Satety Rules and Begulations Geverning Light-Rail Transit.

## EXISIING RULE

RULE 77.4-B
B. UNDER BRIDGES, ENC.

A reduction of the clearances given in Table $i$ to a clearance of not less than 14 feet above the rails is permitted for trolley span wires under bridges, in tunnels, or in subways, provided the railway does not transpory freight cars where the vertical distance from the top of car or load to trolley contact conductor is less than 6 feet. The grading of the level of trolley span wires from the basic clearance to this reduced clearance is permitted at approaches to bridges, trmels, or subways.

PROPOSED ROLE CEANGE
(SIRIKE OUT RND ONDERINNED)

RULE 77.4-B
B. UNDER BRIDGES, ETC.

A reduction of the clearances given in Table 1 to a clearance of not less than 14 Leet above the rails is permitted for trolley span wires under bridges, in tunnels, or in subways, ant io 0-750 volt conductors within exelusive ane semi-exelusive zights-of-wav os defjned ky Aligment classifications 9.04-2. and 2.04-6. (1) contained in General order NO. $243-1$ " "safety Rules and Reculations Governing xightaRail reansit", provided the railway does not transport freight cars whexe the vertical distance from the top of car or load to troliey contact conductor is less than 6 teet. The grading of the level of trolley span wires from the basic clearance to this reduced ciearance is peruitted at approaches to bridges, tunnels, or subways.

## RULE 77.4-B

B. UNDER BRIDGES, ETC.

A reduction of the clearances given in Table 1 to a clearance of not less than 14 feet above the rails is permitted for trolley span wires under bridges, in tunnels, or in subways, and for $0-750$ volt conductors within exclusive and semi-exclusive rights-of-way as defined by Alignment Classifications 9.04-a. and 9.04-b. (1), contained in General Order No. 143-A, "Safety Rules and Regulations Governing Light-Rail Iransit", provided the railway does not transport freight cars where the vertical distance from the top of car or load to trolley contact conductor is less than 6 feet. The grading of the level of trolley span wires from the basic clearance to this reduced clearance is permitted at approaches to bridges, tunnels, or subways.

ITEM 17

- Rule 84.8-A
- Rillo 84.8-B1
- Rule 84.8-B2
- RuIO 84っ8-C
- Rule 84,8-C1
- Pulie 84.8-C2
- Rulo 84.8-C3
- Rulio 84,8-D1

Modern technology continues to make obsolete materisis used in todsys telecommundeations industry. This rule change is proposed to allow fiexibility within the industry to utilize the newer technologies while maintaining the standards as set forth in Section IV.

EXISTING RULE
ROLE 84.8-A
SERVICE DRORS
ROLE 84.8-A (Page 233)

1. A. MATERIAL AND SIZE
2. Communication service drops shall be of material and size as
3. specified in Table 8 and Rule 49.4-C7b with a covering at least
4. equivalent to standard double-braid weatherproofing.

PROPOSED ROLE CHANGE<br>(STRIIE OUT AND ONDERLINED)<br>ROLE 84.8-A<br>SERVICE DROPS

RULE 84.8-A (Page 233)

1. A. MATERIAL AND SIEE




PROPOSED RULE CEANGE
(FINAI)
RULE 84.8-A SKRVICE DREPS:

ROLE 84.8-A (Page 233)

1. A. MATERTAL AND SITR (See Table 8 Rule 49.4-C7b)

## RATIONALE FOR PROPOSED ROLE CEANGE RULE 84.8-B1 SERVICE DRORS

This proposed rule change alters grammetical style to reflect modern usage.

EXISTING ROLE
ROLE 84.8-B1
SERVICE DROPS
ROLE 84.8-B1
B. ATTACED TO SURFACE OF POLE

1. (1) Service Drops From Open Wire Lines: Where open wire
2. commanication line conductors are supported on crossarms. service
3. drop attachments (by means of hooks, knobs, or brackets) on the
4. surface of pole shall be not less than 6 feet below or 4 feet above
5. the level of the nearest unprotected supply conductor supported on
6. the same pole.

> PROPOSED ROLE CEANGE
> (STRIKG OUT AND ONDERLINED)
> ROLE 84.8-BI
> SKRVICE DROPS

ROLE 84.8-B1
B. ATTACEED TO SURFACE OF POLR

1. (1) Service Drops From Open Wire Lines/_Supported_on Crossaxms:


2. brackets) on the suxface of pole shall pot be not lees than 6 feet
3. below or 4 feet above the level of the mearest unprotected supply
4. conductor supported on the same pole.

ROLE 84.8-81

1. (1) Service Drops From Open Wiro Lines Supported on Crossaxms:
2. Attachments, (by means of hooks, knobs, or brackets) on the surface 3. of pole shall not be less than 6 feet below or 4 feet above the level
3. of the nearest unprotected supply conductor supported on the same
4. pole.

RATIONALE FOR PROPOSED RULE CEANGE
RULE 84.8-82
SERTICE DROPS

This proposed rule change has been reformatted for the convenience of the reader to establish subparagraph structure, thus allowing for elimination of text redundancy, obsolete drop hardware and accompanying text instruetions and figures. In addition, gramatical style has been altered to refiect contemporary usage.

> EXISTING ROLE
> RULE 84.8-B2
> SERVICE DROPS

RULE 84.8-82

1. (2) Service Drops From Cabled Lines:
2. (a) Cable Supported on Crossarm: Service drops attached to
3. erossarms supporting cables shall be not less than 15 inches
4. from center line of poie as required by Table 1 , Case 8 ,
5. Coiuma B.
6. (b) Cable Without Guard Arm, Supported on Surface of Pole:
7. Where the cable is supported on the surface of pole with
8. mescenger and cable 6 feet or more below the level of the
9. nearest unprotected supply conductor, service drops may be
10. attached to opposite sides of poles but not more than two sides
11. (there being four sides). Such service drop attachments shall be 12. not less than 6 feet below the level of any supply conductor of
12. more than 750 volts and shall be not less than 5 feet vertically
13. below the level of any unprotected supply conductor of 0-750
14. volts. Wheze drive hooks are used, they shall occupy pole
15. surface areas not more than 8 inches in vertical extent and 1
16. anch in width, and not more than four hooks shall be placed in
17. each of these areas. See Appendix G. Figure 39.
18. (c) Cable With Guard Arn, Supported on Surface of Pole: Where
19. the cable is supported on the surface of pole at a minimum of 4 22. feet below the nearest unprotected supply conductor supported on
20. the same pole, and is below a gaard arm, service drop
21. attachments may be attached to the face, back and bottom of the
22. guard arm, provided such attachments are not less than 15 inches
23. Erom center line or pole, the drop wires are below the top
24. surface of the guard arm and the latersl mu of the drop wires
25. it installed in accordance with the provisions of Eule 84.6-C.

# PROPOSED ROLE CEANGE (STRIKE ODT AND UNDERUINED) <br> ROLE 84.8-B2 <br> SERTICE DROPS 

RULE 84.8-82

1. (2) Service Drops From Cabled Lines:
2. (a) Cable Supported on Crossarm: Service drops attached to
3. erossarms supporting cables shall pe not be less than 15 inches
4. from the certer line of pole as required by Table 1 . Case 8,
5. Column B.
6. (b) Cable Without Guard Anm, Supported on Surface of Pole:





7. than 6 feet below the level of any supply conductor of more than 13. 750 volts and shall be not be less than 5 feet vertically below
8. the level of any unprotected supply conductor of 0-750 volts.


9. and 1 inch in width, and not more than four hooks shall be placed
10. in each of these areas. See Kppendix//a/ Figure 79\% 84-1
11. (Rule 84, 8-B26)
12. (3) Service_dreps shald_net be_attached to_mere_than_threesides
13. (there being font sides) while maintaining cilimbing space.
14. (c) Cable With Guard Arm, Supported on Surface of Pole: Whettithe

-.
(STRIKE OOT AND ONDERLINED - ROLE 84.8-B2 Cont.)




15. than 15 inches from the center line of pole. previded the drop wines
are
16. below the top surface of the gaard sym and the lateral run of the
 31. 84.5-C.

> FROPOSED RULE CEANGK
> (FINAL)
> ROLE 84.8-B2
> SERVICE DROPS

ROLE 84.8-B2
2. (2) Sexvice Drops From Cabled Lines:
2. (a) Cable Supported on Crossarms: Service drops. attached to
3. eroseayms supporting cables shall not be lese than 15 inehes from
4. The center line of pole as required by Table 1 , Case 8, Column B.
5. (b) Cable Without Guard Arm, Supported on Surface of Pole:
6. (1) Attachments shall not be less than 6 feet below the level of
7.
8.
9.
20.
11.
12. shall be placed in each of theze axeas.
13.
14.
15. (there being four sides) while maintaining climbing space.
16. (c) Cable With Guard Arms, Supported on Surface of Pole:
17. Attschments may be placed on the face, back and bottom of the guard
98. arm not less than 15 inches from the eenter line of pole, provided
19. the drop wires are below the top suxface of the giard arm and the
20. Iateral run of the drop wires is installed with the provisions of
21. RuIe 84.6-C.

RATIONALE FOR PROPOSED ROLE CEANGE RULE 84.8-C SKRVICE DROPS

This proposed rule change alters gramatical style to reflect modern usage.

> EXISTING ROLE
> RULE 84.8-C
> SERVICE DROPS

RULE 84.8-C
C. CLEARANGES ABONE GROUND AND BOILDINGS

1. The vertieal clearances of commaication service drops shall be not
2. Less than the minimum clearances specified in Eule 37, Toble 1 .
3. Columa $B$, with the following modifications.

PROPOSED ROLE CEANGE (STRIKF OUT AND UNDERLINED) RULE 84.8-C SERVICE DROPS

ROLE 84.8-C
C. CLIEARANCES ABOFE GROUND AND BOILDINGS
 2. not be less than the minimum clearances specified in Rule 37, Table
3. 1, Column B, with the following modificationsi

## PROPOSED RULE CEANGE <br> (FINAL) * <br> ROLE 84.8-C SERVICE DROPS

RULE 84.8-C
C. CLFARANCES ABOVE GBOUND AND BUILDINGS

1. The vertical clearances shail not be less than the minimum clearances
2. specified in Ruie 37, Table 1. Column B, with the following
3. modifications:

## RATIONALE FOR PROPOSED ROLE CHANGE ROLE 84.8-C1 SERVICE DROPS

This rule change is proposed for clarity and simplification of the rule's language. Additionally the rule structure, as currently written, is slightly reformatted to help focus the readexs attention on the rule's exception.

ROLE 84.8-C1
2. (1) Above Public Thoroughfares: Service drop conductors shali have
2. a vertical ciearance of not less than 18 feet above public
3. thoroughfares, except that this clearance may grade from 28 feet. at. a
4. position not more than 12 feet horizontally from the surb line to $a$
5. clearance of not less than 16 leet at the curb line, provided the
6. Clearance at the center line of any public thoroughfare shali in no
7. case be less than 18 feet. Where there are no curbs the foregoing
8. provistons shall apply using the outer limits of possible vehicular
9. movement in lieu of a curb line.

PROPOSED RULE CBANGE
(STRIKE OUT AND ONDERLINED)
ROLS 84.8-C1
SERTICS DROPS
ROLE 84.8-C1



4. EXCEETION: TSX
5. Not more than 12 feet horizontally from the surb lined



9. gradualiy recuecd to net less than 16 feet at the curb ingen in
10. no ease shail the elearance at the center line be less than 18 feet.
11. Where there are no curbs, the foregoing provisions shall apply using
12. the outer limits of polswixf nomal longitudinal vehicular movement
13. in lieu of a eurb line.

PROPOSED ROLE CEANGF
(FINAL) *
ROLE 84.8-C1
SERVICE DROPS
RULE 84.8-C1

1. (1) Above Public Thoroughfarcs: Vertical elearance shali not be
2. Less than 18 feet.
3. EXCEPTION: Not more than 12 feet horizontalily from the curb line,
4. the 18 foot clearance may be gradually reduced to not less than 16
5. feet at the curb inne. In no case shall the clearance at the ecoter
6. Line be less than 28 feet. Where there are no curbs, the foregoing
7. provisions shall apply using the outer limits of normal lomgitudinal
8. vehicular movement in lieu of a curb line.

This rule change is proposed for clarity and simplification of the rul language and reduce the repetitious use of certain words. Additionally the rule structure, as currently written, is slightly reformatted to help focus the readers attention on the rule's exception.

ROLE 84.8-C2

1. (2) Above Private Thoroughfares or Private Property:
2. (a) Industrial and Comexcial Premises: Over private driveways or 3. lanes, or over private property accessible to vehicles, service drops 4. shall have a vertical clearance of not less than 16 feet.
3. (b) Residential Premises: Over residential driveways or lanes, or 6. over residential property accessible to vehicles, service drofs shall 7. have a vertical clearance of not less than 12 feet. If the building 8. served does not permit an attachment which will provide this 12 foot 9. clearance without the installation of a structure on the builaing the 10. clearance shall be as great as possible but in no case less than 10 11. feet.

## PROPOSED ROLS CEANGE (STRIKE OOT AND ONDERUINED) ROLE 84.8-C2 SERTICE DROPS

ROLE 84.8-C2

1. (2) Above Private Thoroughiaxes or Private Property:
2. (a)Industrial and Comercial Premises: Over private driveways ${ }_{\perp}$


3. 16 feet.
4. (b)Residential Premises: Over residential driveways, $\phi x$ lanesh


5. EXCEPPION: If the building eerved does not permit an atrachment
6. which will provide this 12 foot clearance without the installation of
7. a structure on the building, the clearance shall be as great as
8. poseiblea but in no case less than 10 feet.
9. NOTE: in_exceptional_eixcumstances, see_fule 14

## PROPOSED RULE CEANGE (FINAL)

RULE 84. 0 -C2
SERTICE DROPS
RULE 84.8-C2

1. (2) Above Private Thoroughfares or Private Property:
2. (a) Industrial and Commercial Premises: Over private driveways,
3. lanes or property accessible to vehicles, service drops shall not be
4. Less than 16 feet.
5. (b) Residential Premises: Over residential dxivewaye, lanes or
6. property accessible to vehicles, service drops shall not be less
7. 12 feet.
8. EXCESPTION: If the building served does not permit an attachment
9. which will provide this 12 foot clearance without the imstallation of
10. a structure on the building, the clearance shall be as great as
11. possible, but in no case less than 10 feet.
12. NOTE: In exceptional circumstances see Rule 14

RATIONALE FOR PROPOSED ROLE CHANGE
RULF 84.8-C3
SERVICE DROPS
This rule change is proposed for clawity and simplification of the zule's lamguage. Adcitionally the rule =tructure, as currently written, is slightiy reformatted to help focus the readers attention on the rule's exception and realien the words "Table. Case and Column" thereby maintaining coatiauity of format throughout the General Order.

## EXISTING ROLS

RULE 84.8-C3
SERVICE DROPS
ROLE 84.8-C3

1. (3) Above Ground in Areas Accessible to Pedestrians Only:
2. (a) Industrial and Comercial Premises: Over areas accessible to 3. pedestrians only, service drops shall have a vertical clearance of
3. not less than 12 feet.
4. (b) Residential Premises: Over areas accessible to pedestrians 6. only, service drops shall be maintained at a vertical clearance oi 7. not less than 10 feet. If the building served does not permit an 8. attachment which will provide this 10 -foot clearance without the 9. installation of a structure on the building, the ciearance shali be 10. as great as possible but in no case. less than 8 feet 6 inches.
5. ( ( ) Abovo Ground on Fenced Railway Rights-of-Way: Service drops to 12. railway signal devices shall be maintained at clearances as speciñ 13. in Rule 84.4-A4. Service drops which are entirely on fenced rainul 14. zights-of-way in sreas accessible to pedestrians only may have 25. Clearances above ground less than as specifined in Table 1, Column B, 26. Case 5 ( 10 feet), but not less than 7 feet.

PROPOSED ROLE CEANGE (STRIKK OUT AND ONDERUINED) ROLE 84.8-C3 SERVICE DROPS

RULE 84.8-C3

1. Above Ground in Areas Accessible to Pedestrians Only:
2. (a) Industrial and Comercial Premises: Over areas nceessible to 3. pedestrians only, texfi申k/dxøps the vertical_clearance shall kaye

3. (b) Residential Premises: Over areas accessible to pedestrians
4. only, $\$ \notin y^{\prime} \dot{\text { q }}$

5. EXCAPTION: If the building served does not permit an attachment
6. which will provide this 10 -foot elearance without the instaliation of
7. a structure on the building, the clearance shall be as great as
i1. possible but in no case less than 8 feet 6 inches.
8. (c) Above Ground on Fenced Railway Rights-of Way: SSeemale
9. 84,4-A4)





10. 2Max/7/スéx/

# PROPOSED RULE CEANGE <br> (FINAL) 

ROLE 84.8-C3
SERVICE DROPS

## ROLE 84.8-C3

1. Above Ground in Areas Accessible to Pedestrians Only:
2. (a) Industrial and Commercial Premises: Over areas accessible to 3. pedestrians only, the vextical clearance shall not be less than 12 4. feet.
3. (b) Residential Premises: Over areas accessible to pedestrians 6. coly, the vertical clearance shall not be less than 10 feet.
4. EXCEPTION: If the building served does not permit an attachment
5. which will provide this $10-f 00 t$ clearance without the installation of 9 a structure on the building, the clearance shall be as great as 10. possible, but in no case less than 8 feet 6 inches.
6. (c) Above Ground on Fenced Railway Rights-of-Way: (See Ruje
7. 84.4-A4)

ROLE 84.8-D1 (Page 236)

1. (1) Above or Below Supply Line Conductors (see Rule 32.2 F ):
2. (a) Crossings in Spans: Service drops which eross below supply line 3. conductors of 0-750 volts, or above supply line cables where troated 4. as in Rule 57.8 , may have a vertical clearance less than as specified
3. in Table 2, Case 4, Columa C ( 48 izches), from zuch supply
4. conductors, but not less than 24 inches; provided the crossing is 6
5. feet or more from any pole which supports any conductor involved in
6. the crossing but which does not support both conductors involved in
7. the crossing.
8. (b) Supported on the Same Pole: Service drops which are supporited 11. on a pole which also support supply conductors and which are not on a 12. poletop clearance attachment may have a vertical elearance lesz than 13. as specified in Table 2, Case 9, Column C ( 48 inches), above or below 14. supply line conductors provided not less than the clearance shown in 15. Table 15 are maintained.

> PROPOSED RDLE CEANGE (STRIKR OUT AND ONDERLINED)
> RULE 84-8-DI
> SERVICE DROPS

RULE 84.8-D1 (Page 236)

1. (1) Above or Below Supply Line Conductors (See Rule 32.2-F):
2. (a) Crossiags in Spans: ITable_2_Case_4_Celama_C C48inchesi:








3. Vertical_elearances_may beredueed_to not less than_24_inches
4. providec:
5. In Cressiogs aremblow line cenductors of $0-750$ volts or soove
6. Line_cables_as_in_Rule 57,8, and

16







(STRIKE OOT AND ONDERLINED - ROLE 84.8-DI COnt.)

7. in Table 15, provided_pole-top clearance_attachments are net
8. invelved.

> PROPOSED RULE CGANGE
> (EINAL)*
> RULE 84-8-D1 SERVIGE DROPS

ROLS 84.8-D1 (Page 236)

1. (1) Above or Below Supply Line Conductors (See Rule 32.2-F):
2. (a) Crossings in spans: (Table 2, Case 4, Column C [48 inches]):
3. Vertical clearances may be reduced to not less than 24 inches
4. provided:
5. 6. Crossings are below line conductors of 0-750 volts, or above -
1. Line cables as in Rule 57.8, and
2. 2. Crossing is 6 feet or more from any pole supporting one, but 8. not both, involved conductors.
1. (b) Supported on the Same Pole (Table 2, Case 9, Colum C
2. [48 inches]): Vertical clearances may be reduced to not less than
3. The values show in Table 15, provided pole-top ciearance attachments 12. are not involved.

ITKM 18

- Fule 92.1-F4

BETWEEN CONDOCTORS, CABLES, YESSENGERS RND KISC. EQUIPNENT TRANSFORUERS OR REGUTATORS

Provide a new Figure to clarify the language of Rule 92.1-F4.

Rule 92.1-F4
(4) Transformers or Regulators: Transformers or regulators of supply systems shall nomally be located above comunication equipment. Where it is necessary to locate transformers or regulators below comunication equipment they shall be placed at least 6 feet vertically below and all energized parts shall be protected and guarded so as to afford the least possibility of contact.

Where transformers or regulators are instalied on platforms having continuous flooring which extends not less than 1 foot horizontaliy outside of the vertical plane of all transformers or regulator lead and bus wires on the same pole or structure, cables or other conductors may be installed at a minimum vertical distance of 12 inches below the transformer or regulator cases provided such cables or conductors do not extend lateraliy beyond the platform.

PROPOSED RUTE CHANGE (STRIKE OTT AND UNDERIINED)

ROLE 92.1-F4
TRANSFORMERS OR REGDIATORS

Rule 92.2-F4
(4) Transformers or Regulators: Transformers or regulators of supply systems shall normally be located above comunication equipment. Where it is necessary to locate transformers or regulators below comunication equipment they shall be placed at least 6 feet verticaliy below and all energized parts shail be protected and guarded so as to afford the least possibility of contact.

Where transformers or regulators are installed on platforms having continuous flooring which extends not less than 1 foot horizontalily outside of the vertical plane of all transformers or regulator lead and bus wires on the same pole or structure, cables or other conductors may be installed at a minimum vertical distance of 12 inches below the transformer or regulator cases provided such cables or conductors do not extend laterally beyond the plationm (seefie. 22-12.


Transformers or Regulators (Rule 92.1-F4)
Figure 92-1
(4) Transformers or Regulators: Transformers or zegulators of supply systems shall normally be located above commanication equipment. Where it is necessary to locate transformers or regulators below comunication equipment they shall be placed at least 6 feet vertically below and all energized parts shall be protected and guarded so as to afford the least possibility of contact.
where transformers or regulators are instalied on platforms having continuous flooring which extends not less than 1 foot horizontaliy outside of the vertical plane of all transformers or regulator lead and bus wires on the same pole or structure, cables or other conductors may be instadied at a minimum vertical distance of 12 inches below the transformer or regilator cases provided such cables or conductors do not extend lateraliy beyond the platform (see fig. 92-1).


Transformers or Regulators (Rule 92.1-F4) Figure 92-1


[^0]:    
    (b) Hay bu retuced tor timasformor regulator or capachtor duands.

    1. Tranuformant juada

    38,3-1
    
    (1i) Miay ler reduced acruss andd or mounlalnous artas.

    1. Simply conductors of moro than 22,500 volls
    2. Cumminscoltum conductors
