UNITED STATES

DEPARTMENT OF AGRICULTURE

# RURAL UTILITIES SERVICE

## SUMMARY OF

## ITEMS OF ENGINEERING INTEREST

## AUGUST 2003

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## NRECA T&D ENGINEERING COMMITTEE



## ADMINISTRATIVE and OTHER

# ABBREVIATIONS

| | |
|---|---|
| ANOPR | Advanced Notice of Proposed Rulemaking |
| ANSI | American National Standards Institute |
| APP | Avian Protection Plan |
| ASCE | American Society of Civil Engineers |
| AWG | American Wire Gage |
| CFR | Code of Federal Regulations |
| CRN | Cooperative Research Network |
| CT | Current Transformer |
| CWP | Construction Work Plan |
| DG | Distributed Generation |
| DMA | Designated Market Areas |
| DOE | Department of Energy |
| DTV | Digital Television |
| EA | Environmental Assessment |
| EDB | Environmental Data Base |
| EES | Engineering and Environmental Staff |
| ESD | Electric Staff Division |
| EIS | Environmental Impact Statement |
| EODP | Emergency Operation Disaster Plan |
| EPA | Environmental Protection Agency |
| ER | Environmental Report |
| EVAL | Environmental Analysis |
| FCC | Federal Communications Commission |
| FONSI | Finding of No Significant Impact |
| G&T | Generation and Transmission |
| GATT | General Agreements on Tariff and Trade |
| GFR | General Field Representative |
| GIS | Geographic Information System |
| HDTV | High Definition Television |
| IAIP | Information Analysis and Infrastructure Protection |
| IEEE | Institute of Electrical and Electronics Engineers |
| kV | Kilovolt |
| LRP | Long Range Plan |
| mA | Milliampere |
| MBTA | Migratory Bird Treaty Act |
| MW | Megawatts (1,000,000 watts) |
| MOU | Memorandum of Understanding |
| NAFTA | North American Free Trade Agreement |
| NESC | National Electrical Safety Code |
| NOAA | National Oceanic and Atmospheric Administration |
| NOPR | Notice of Proposed Rulemaking |
| NRECA | National Rural Electric Cooperative Association |

# ABBREVIATIONS *(continued)*

| | |
|---|---|
| O&M | Operation and Maintenance |
| PDTAB | Power Delivery and Transmission Assessment Branch |
| PE | Professional Engineer |
| PT | Potential Transformers |
| RCRA | Resource Conservation and Recovery Act |
| REA | Rural Electrification Administration |
| REPC | Rural Electric Power Conference |
| rms | Root-Mean-Squared |
| RUS | Rural Utilities Service |
| RUS List of Materials | RUS Informational Publication 202-1, "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers" |
| SEI | Structural Engineering Institute |
| SPCC | Spill Prevention, Control, and Countermeasure |
| T&D | Transmission & Distribution |
| T&DEC | Transmission & Distribution Engineering Committee |
| TSC "A" | Technical Standards Committee "A" (Electric) |
| UA | Urban Area |
| UC | Urban Cluster |
| UHF | Ultra-High-Frequency |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| USTR | United States Trade Representative |
| VA | Volt-Amperes |
| VT | Voltage Transformers |
| WPC | Wholesale Power Contract |
| XLP | Cross-Linked Polyethylene |
| XLP-TR | Cross-Linked Polyethylene with Tree-Retardant |

# DESIGN

## Future New 15 KV Construction Standards

The Rural Utilities Service (RUS) is in the process of updating and revising Bulletin 50-3, "Specifications and Drawings for 12.5/7.2 kV Line Construction." As currently proposed, the bulletin will have the same title but will be issued as RUS Bulletin 1724F-804.

Notice of availability of proposed revision of the bulletin will be made by publishing a proposed rule in the *Federal Register*. When the proposed Rule is issued, RUS borrowers should obtain a copy of the bulletin, scrutinize its drawings and specifications, and send RUS their comments.

The proposed bulletin revision will contain the following significant changes:

- Several new assemblies and a complete series of narrow profile assemblies will be added.
- New assembly categories (Sections) will be added and the bulletin will be reorganized.
- New assembly numbers that conform to RUS' updated standard assembly numbering format will be added. Borrowers may continue to use the existing numbers of those assemblies carried over from Bulletin 50-3 as carried over assemblies in the revised bulletin will have dual drawing numbers (old and new numbering system).
- The proposed bulletin specifies the installation of a 2 ¼-inch square washer under the shoulder of all 7.2 kV crossarm pins and the installation of a 3-inch square, curved washer abutting the pole on all primary, neutral and guy deadends. RUS recommends that borrowers make these changes now to allow larger line angles and greater longitudinal loading for conductors and guys.
- When applicable, the proposed new drawings reference tables in the bulletin appendix that show the assembly's permitted loading and maximum permitted line angle. The use of these tables will minimize engineering calculations, and assure greater accuracy and conformance to the NESC.
- The proposed new construction standards will allow the use of stirrups without further approval from RUS provided the stirrups are used in the specific conditions specified in the bulletin.

Some borrowers may need to modify their engineering and accounting computer programs and databases to accommodate the proposed new and revised assemblies. These modifications may cause problems to those borrowers who do not have the flexibility in their software to make the necessary changes. **RUS recommends that borrowers examine all existing and potential new engineering and accounting software to ascertain that it will allow easy addition and change to the RUS standard construction assembly numbers and materials.**

If you would like more information or have any questions, please contact James Bohlk, Electrical Engineer, Distribution Branch, at 720-1967 or at Jim.Bohlk@usda.gov.

## Narrow Profile Construction Assemblies

New Proposed Narrow Profile Assemblies Developed: RUS has developed a complete set of narrow profile construction assemblies for use by borrowers. The set of 89 proposed new assemblies (depicted on 59 drawings) incorporates three different "styles" of pole-top assembly configurations. Sample drawings for the three styles are shown on Exhibits 1, 2 and 3 on the following pages. If a RUS borrower has a need for narrow profile construction, RUS recommends that one of new proposed styles developed by RUS be used for the following reasons:

- The proposed vertical and horizontal conductor spacing allows relatively long spans, comparable to crossarm construction, and thus is economically favorable;
- The proposed 2-foot vertical spacing of conductors of the first two styles minimizes the need for taller poles for narrow profile construction and thus is also economically favorable;
- The first style can be used to convert existing RUS standard single-phase lines to three-phase narrow profile without changing out existing poles and materials;
- All three proposed styles are relatively raptor friendly;
- Each proposed new assembly complies with the requirements of the National Electrical Safety Code (NESC);
- Each proposed new assembly can be constructed with materials presently listed in RUS Informational Publication 202-1, "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers;" and,
- The assemblies coincide with RUS' proposed new standard design narrow profile assemblies.

Narrow Profile is Non-Standard Construction: Presently, narrow profile distribution construction is considered by RUS to be non-standard construction because the assemblies needed for construction are not published in RUS' distribution construction specifications and drawings. RUS may approve narrow profile construction (similar to other non-standard

construction), on a case-by-case, site specific basis, if a borrower fulfills the following requirements:

(1) The borrower's General Field Representative (GFR) has reviewed the need or other sufficient reasons for narrow profile construction and approved its use, and,

(2) The Regional Engineering Office in Washington has reviewed the non-standard assemblies (and non-listed material, if applicable) and provided written approval.

Future Publication of Narrow Profile Assemblies: RUS is planning to incorporate new narrow profile assemblies in the proposed new updated and revised Bulletin 50-3, "Specifications and Drawings for 12.5/7.2 kV Line Construction." RUS also proposes to renumber the standard as Bulletin 1728F-804. This proposed updated bulletin is presently in the review and approval process prior to its publication in the *Federal Register* as a proposed rule for comments. If still included in the document after publication in the *Federal Register* as a final rule (and there is no reason to expect it will not be included), the proposed new narrow profile assemblies will become standard construction assemblies and can be routinely used by borrowers without the need to fulfilling the requirements of (1) and (2) above.

Borrowers May Request Preliminary Use of New Narrow Profile Assemblies: RUS recognizes borrowers' immediate needs and desires to use narrow profile construction. The following steps will allow borrowers to use the proposed new RUS narrow profile assemblies with a minimum (but required) effort prior to the standardization of the proposed new narrow profile assemblies:

(1) As presently established, each GFR may approve the use, if justified, of narrow profile construction on a case-by-case, site-specific basis,

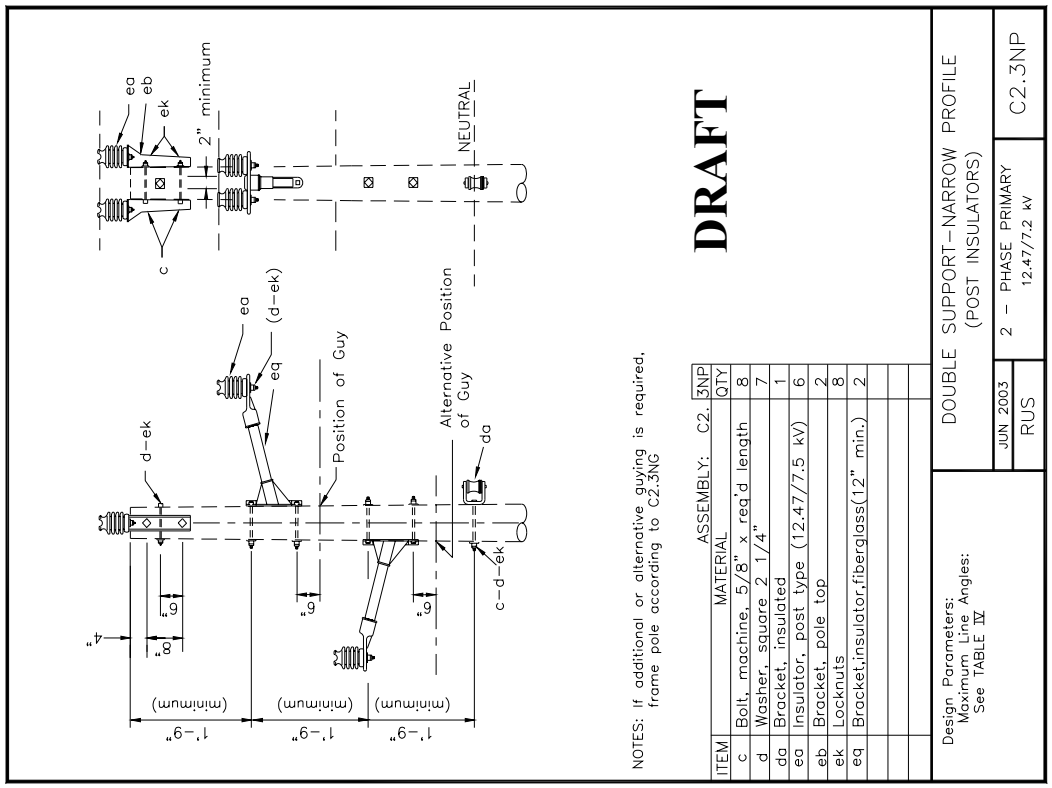
(2) Upon request, the GFR will furnish the borrower with draft copies of the proposed new RUS narrow profile assembly drawings and proposed specifications for use on approved projects,

(3) The use of the proposed new RUS narrow profile assemblies and resulting construction are considered by RUS to be "experimental to gain experience." As such, RUS requests that borrowers provide comments on observed errors and suggested improvements regarding the proposed assemblies and designs, and,

(4) The GFR will inform the appropriate Regional Engineering Office in Washington in writing (to be placed in the borrower's file) information regarding each approved narrow profile construction project.

If you would like more information or have any questions concerning this program, please contact John Pavek, Chief, Distribution Branch, at 202-720-5082 or at John.Pavek@usda.gov, or James Bohlk, Electrical Engineer, Distribution Branch, at 202-690-1967 or at Jim.Bohlk@usda.gov.

# Exhibit 1 - Typical Narrow Profile Pole-Top Assemblies: First Style



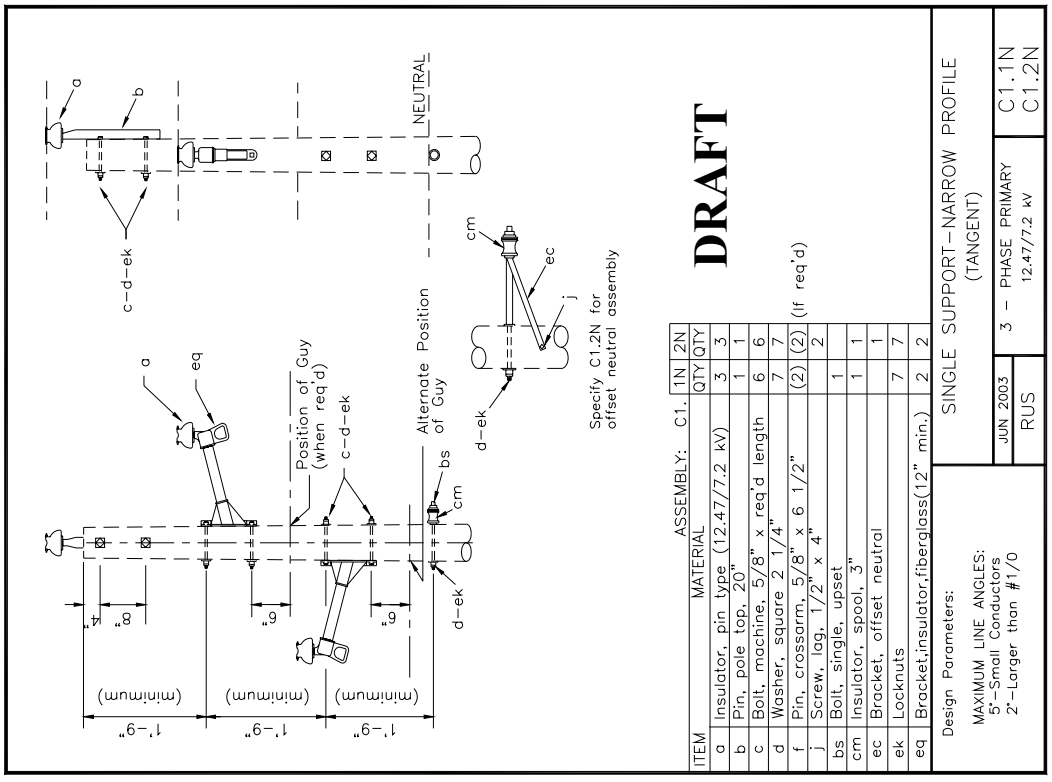
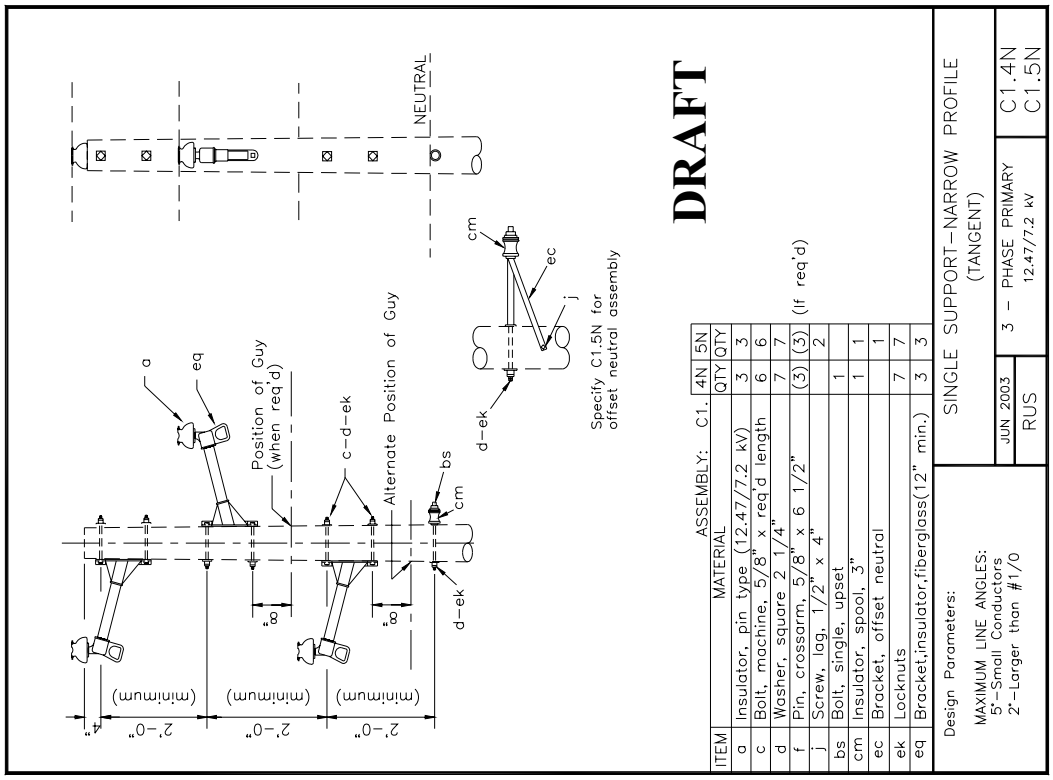
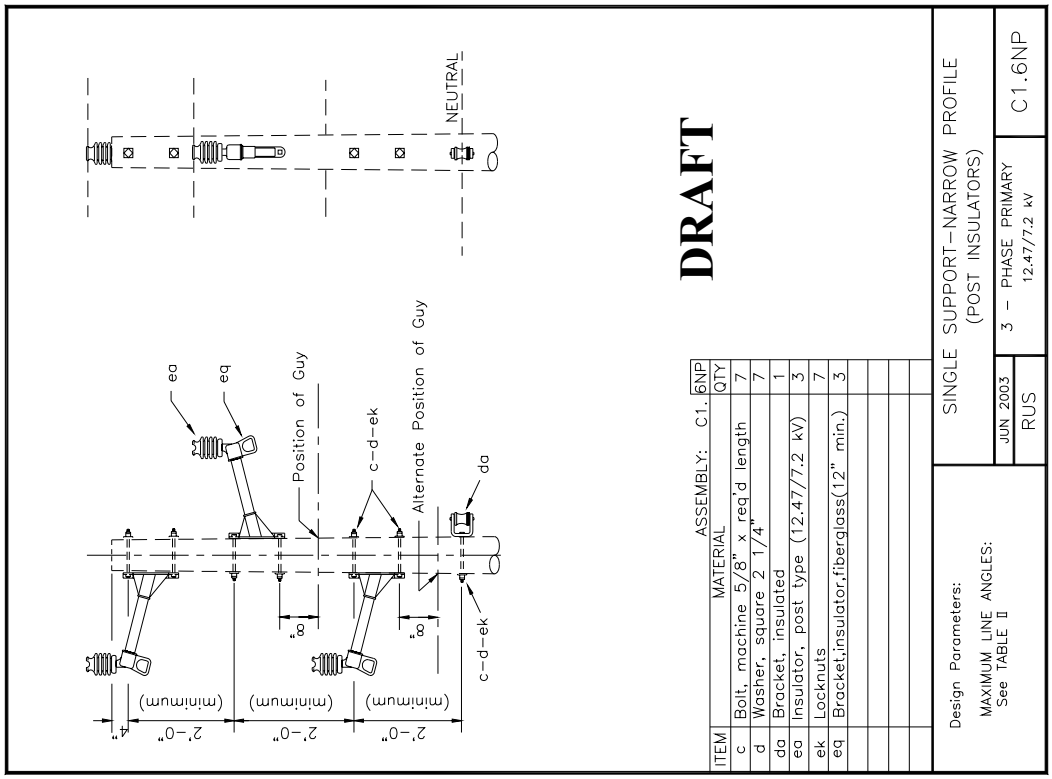
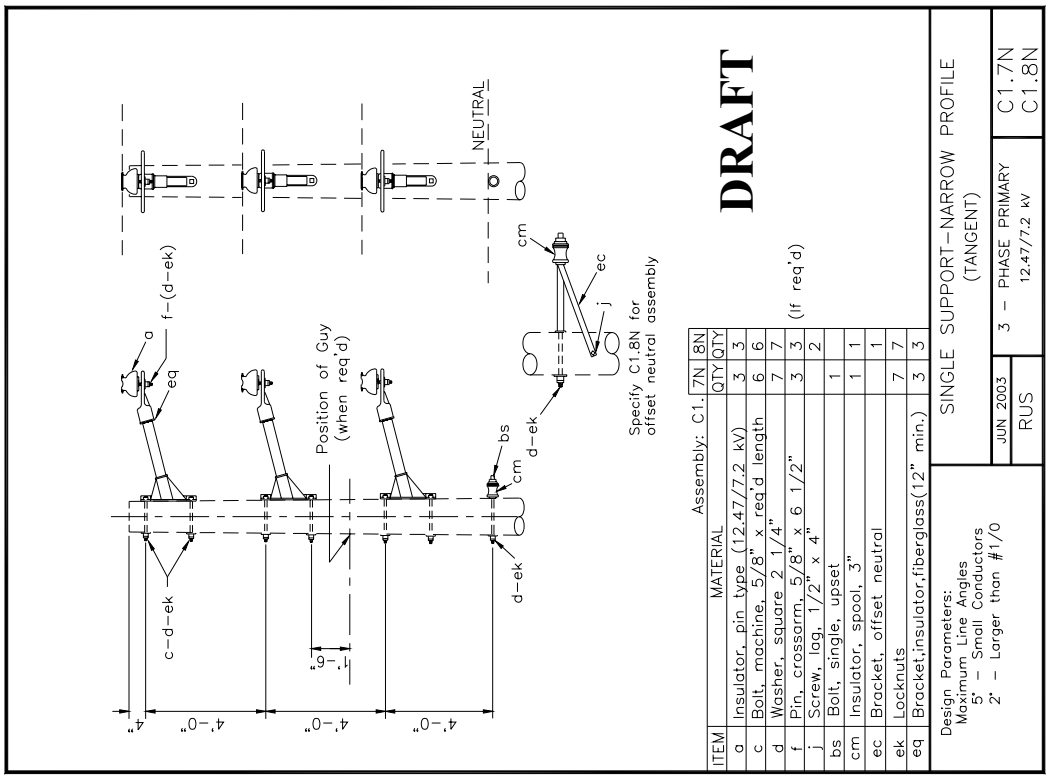



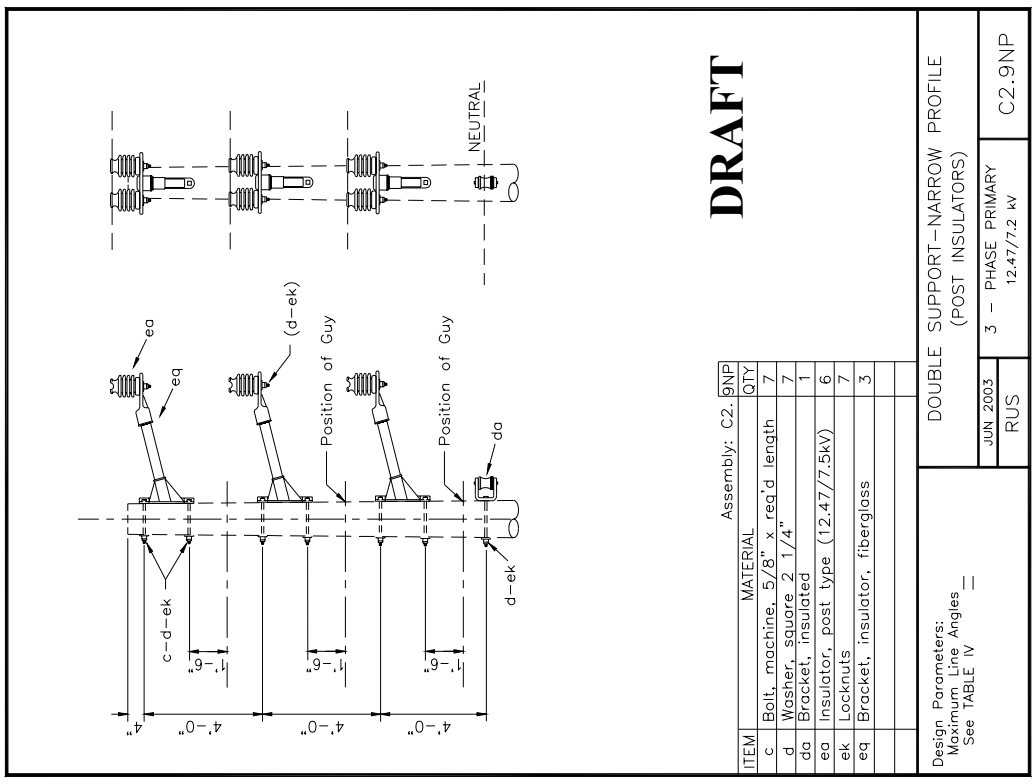
Exhibit 2 - Typical Narrow Profile Pole-Top Assemblies: Second Style



# Exhibit 3 - Typical Narrow Profile Pole-Top Assemblies: Third Style



## Safety Sign Update

The two safety signs that are commonly found on RUS borrowers' electrical systems are "Warning" and "Danger" signs.

A "Warning" sign indicates the nearby existence of a potentially hazardous situation which, if not avoided, **could** result in death or serious injury. A "Danger" sign indicates the existence an imminently hazardous situation which, if not avoided, **will** result in death or serious injury. Use of "Danger" signs should be limited to the most extreme situations.

For dead-front pad-mounted electrical equipment, RUS recommends that a "Warning" sign be placed on the exterior and a "Danger" sign be placed inside the enclosure.

For substations, RUS recommends that a "Warning" sign be placed on all faces of the surrounding fence and a "Danger" sign be installed inside the substation on all faces of structures that support live parts.

If you would like more information or have any questions, please contact Trung Hiu, Electrical Engineer, Distribution Branch, at 202-720-1877 or at Trung.Hiu@usda.gov.

## Design Manual for High Voltage Transmission Lines

RUS Bulletin 1724E-200, Design Manual for High Voltage Transmission Lines, is currently under revision. This bulletin is being revised by the Transmission Subcommittee of the NRECA T&D Engineering Committee. The expected completion date for this revision and update is March, 2004. This bulletin will be based on the 2002 Edition of the National Electrical Safety Code. In accordance with 7 CFR Part 1724, RUS transmission lines are to be a minimum of Grade B construction as defined in the NESC. However, since the NESC is a safety code and not a design guide, additional information and design criteria are provided in this bulletin as guidance to the engineer.

This guide publication is a reference of fundamental engineering guidelines and basic recommendations. The subject area includes structural and electrical aspects of transmission line design as well as explanations and illustrations. Numerous cross-references and examples should be of great benefit to engineers performing design work for RUS borrower transmission lines 230 kV and below.

This design bulletin has been expanded to include references and some design information for steel and concrete poles. Additional design information for steel and concrete poles may be found in the appendices and commentary of other bulletins concerning steel and concrete poles. Many of the clearance tables in the proposed revision of the Design Manual for High Voltage Transmission Lines will reference the appropriate sections of the NESC from which the clearance tables are based, as well as give an example of the clearance calculation. In addition, each table will include information as to how much the 'RUS recommended clearance' is above the minimum NESC. An example of a typical clearance table is given below.

## DRAFT OF TABLE 4-1

(continued on next page)

## RUS RECOMMENDED DESIGN VERTICAL CLEARANCES OF CONDUCTORS ABOVE GROUND, ROADWAYS, RAILS, OR WATER SURFACE (in feet) (Notes A, F & G) (NESC Rules 232A, 232B, and Table 232-1)

**Line Conditions Under which the NESC States Vertical Clearances Shall be Met (Calculations are Based on Maximum Operating Voltage):**

- 32°F, no wind, with radial thickness of ice, if any, specified in Rule 250B of the NESC for the loading district concerned.
- Maximum conductor temperature for which the line is designed to operate, with no horizontal displacement

| **Nominal Voltage, Phase to Phase ($kV_{LL}$)** | | **34.5 & 46** | **69** | **115** | **138** | **161** | **230** |
|---|---|---|---|---|---|---|---|
| Max. Operating Voltage, Phase to Phase | ($kV_{LL}$) | ---- | 72.5 | 120.8 | 144.9 | 169.1 | 241.5 |
| Max. Operating Voltage, Phase to Ground | ($kV_{LG}$) | ---- | 41.8 | 69.7 | 83.7 | 97.6 | 139.4 |
| | **NESC Basic Clear.** (Note F) | | | | | | |
| 1.0 Track Rails | 26.5 | 29.2 | 29.7 | 30.6 | 31.1 | 31.5 | 32.9 |
| 2.0 Roads, Streets, etc., subject to truck traffic | 18.5 | 21.2 | 21.7 | 22.6 | 23.1 | 23.5 | 24.9 |
| 3.0 Driveways, Parking Lots, and Alleys | 18.5 | 21.2 | 21.7 | 22.6 | 23.1 | 23.5 | 24.9 |
| 4.0 Other Lands Cultivated etc., traversed by vehicles (Note B) | 18.5 | 21.2 | 21.7 | 22.6 | 23.1 | 23.5 | 24.9 |
| 5.0 Spaces and ways accessible to pedestrians only (Note C) | 14.5 | 17.2 | 17.7 | 18.6 | 19.1 | 19.5 | 20.9 |
| 6.0 Water Areas – No sail boating | 17.0 | 19.7 | 20.2 | 21.1 | 21.6 | 22.0 | 23.4 |
| 7.0 Water Areas – Sail boating suitable (Notes D & E) | | | | | | | |
| Less than 20 acres | 20.5 | 23.2 | 23.7 | 24.6 | 25.1 | 25.5 | 26.9 |
| 20 to 200 acres | 28.5 | 31.2 | 31.7 | 32.6 | 33.1 | 33.5 | 34.9 |
| 200 to 2000 acres | 34.5 | 37.2 | 37.7 | 38.6 | 39.1 | 39.5 | 40.9 |
| Over 2000 acres | 40.5 | 43.2 | 43.7 | 44.6 | 45.1 | 45.5 | 46.9 |
| 8.0 Public or Private Land and Water Areas Posted for Rigging or Launching Sailboats (Note E) | | | | | | | |
| Less than 20 acres | 25.5 | 28.2 | 28.7 | 29.6 | 30.1 | 30.5 | 31.9 |
| 20 to 200 acres | 33.5 | 36.2 | 36.7 | 37.6 | 38.1 | 38.5 | 39.9 |
| 200 to 2000 acres | 39.5 | 42.2 | 42.7 | 43.6 | 44.1 | 44.5 | 45.9 |
| Over 2000 acres | 45.5 | 48.2 | 48.7 | 49.6 | 50.1 | 50.5 | 51.9 |
| ***ALTITUDE CORRECTION TO BE ADDED TO VALUES ABOVE***: | | | | | | | |
| Additional feet of clearance per 1000 feet of altitude above 3300 feet | | .00 | .02 | .05 | .07 | .08 | .12 |

## DRAFT OF TABLE 4-1

(continued from previous page)

## RUS RECOMMENDED DESIGN VERTICAL CLEARANCES OF CONDUCTORS ABOVE GROUND, ROADWAYS, RAILS, OR WATER SURFACE (in feet) (Notes A, F & G) (NESC Rules 232A, 232B, and Table 232-1)

Notes

(A) For voltages exceeding 98 kV alternating current to ground, or 139 kV direct current to ground, the NESC states that either the clearance shall be increased or the electric field, or the effects thereof, shall be reduced by other means, as required, to limit the current due to electrostatic effects to 5.0 milliamperes (mA), rms, if the largest anticipated truck, vehicle or equipment under the line were short circuited to ground. The size of the anticipated truck, vehicle, or equipment used to determine these clearances may be less than but need not be greater than that limited by Federal, State, or local regulations governing the area under the line. For this determination, the conductors shall be at final unloaded sag at 120° F.

Fences and large permanent metallic structures in the vicinity of the line will be grounded in accordance with the owner's grounding units for the structure concerned to meet the 5.0 milliampere requirement. There should be adequate ground clearance at crossings and along the right-of-way to meet the minimum requirement of 5 mA due to the electrostatic field effects on the anticipated vehicles under the transmission line.

Consideration should be given to using the 5 mA rule to the conductor under maximum sag condition of the conductor.

(B) These clearances are for land traversed by vehicles and equipment whose overall operating height is less than 14 feet.

(C) Areas accessible to pedestrians only are areas where riders on horses or other large animals, vehicles or other mobile units exceeding 8 feet in height are prohibited by regulation or permanent terrain configurations or are not normally encountered nor reasonably anticipated. Land subject to highway right-of-way maintenance equipment is not to be considered as being accessible to pedestrians only.

(D) The NESC states that "for uncontrolled water flow areas, the surface area shall be that enclosed by its annual high-water mark. Clearances shall be based on the normal flood level; if available, the 10 year flood level may be assumed as the normal flood level. The clearance over rivers, streams, and canals shall be based upon the largest surface area of any one mile-long segment which includes the crossing. The clearance over a canal, river, or stream normally used to provide access for sailboats to a larger body of water shall be the same as that required for the larger body of water."

(E) Where the U.S. Army Corps of Engineers or the state, has issued a crossing permit, the clearances of that permit shall govern.

(F) The NESC basic clearance is defined as the reference height plus the electrical component for open supply conductors up to 22 $kV_{L-G}$.

(G) An additional 2.5 feet of clearance is added to the NESC clearance to obtain the recommended design clearances. Greater values should be used where survey methods to develop the ground profile are subject to greater unknowns. See Chapter 10, paragraph 10.3 of this bulletin.

An example of a clearance calculation found in the draft design manual follows:

*The following examples demonstrate the derivation of the vertical clearance of sample categories in Tables 4-1.*

*To determine the vertical clearance of a 161 kV line crossing a road (category 2.0 of Table 4-1), the clearance is based on NESC Table 232-1 and NESC Rule 232.*

$$\text{NESC Vertical Clearance} = \text{NESC Basic Clearance(Table 232-1)} + .4(kV_{L\text{-}G} - 22)/12$$

$$= 18.5 \text{ feet} + .4(97.6\text{-}22)/12 \text{ feet}$$

$$= 18.5 \text{ feet} + 2.52 \text{ feet}$$

$$\text{NESC Vertical Clearance} = 21.02 \text{ feet}$$

$$\text{RUS Recommended Clearance} = \text{NESC Vertical Clearance} + \text{RUS Adder}$$

$$= 21.02 \text{ feet} + 2.5 \text{ feet}$$

$$= 23.52 \text{ feet (23.5 feet in RUS Table 4-1)}$$

If you would like more information or have any questions, please contact Donald Heald, Structural Engineer, Transmission Branch, at 202-720-9102 or at Don.Heald@usda.gov.

## Long Range Planning–Evaluating System Alternatives

The Electric Staff Division and the System Planning Subcommittee of NRECA's Transmission and Distribution Engineering Committee are updating RUS Bulletin 1724D-101A, "Electric System Long-range Planning Guide." As this project began, concern arose about the economic comparisons of Long Range Plan (LRP) alternatives having significant differences in capacity and reliability.

Electric system capacity involves both thermal loading capability of the system and the capability of the system to maintain acceptable primary voltage levels. For large areas of most rural electric distribution systems voltage drop along lines is the principal capacity limiting factor, not the capability for the lines to carry load current.

There are usually alternative solutions to resolve anticipated capacity and voltage problems. Examples include such measures as installing larger conductors, extending 3-phase lines, installing line regulators, voltage conversions, and expanding existing or constructing new substations. Today, many are looking at the strategic placement of distributed generation as another possible cost-effective alternative available. The alternatives mentioned here are only some of the solutions available to the planning engineer. With the wide range of alternatives available, the planning engineer should consider and include reasonable alternative solutions in the LRP.

Reasonable LRP alternatives are improvements to the current system that provide solutions meeting established reliability and safety criteria with capacities and voltage levels that are adequate for the load projected at the end of the long range planning period. Ideally, in developing alternatives in this manner, the alternatives developed will provide solutions to the system that are approximately equivalent in capacity at the end of the planning period. Thus, reasonable economic and engineering comparisons can be made among the alternative plans identified. Reasonable alternatives also could include improvements to the system that affect beneficial cost-saving reductions in system losses.

Alternatives considered need to be effectively analyzed. As an example, LRP's often include alternatives for upgrading 15 kV distribution lines to 25 kV. Typically such upgrades will result in very low primary voltage drops. Voltage conversions usually do not require the use of line voltage regulators. Existing conductors are generally adequate for long-range use and require replacement only where conductors are in poor condition. However, while providing easy long-term solutions to voltage drop concerns, upgrading the system voltage may provide far more thermal capacity and/or voltage improvement than is necessary or economically prudent for the load at the end of the planning period. The planning engineer needs to assess whether the cost of upgrading and its plusses and minuses are beneficial and economically sound for the system for the short-term and the long-term. Are there other alternatives available that will satisfy the anticipated loading without excess capacity and without greater voltage drop improvement than needed? For specific situations there may be good reasons for voltage conversions that result in excess capacity. These reasons (justification) should be included in the LRP documentation and presentation. In most cases, however, good justification for upgrading to 25 kV for (parts of) the system is a presentation that shows that continuation of the upgraded 15 kV system would not economically resolve anticipated electrical problems.

In summary, like the voltage conversion example, all alternatives should be assessed to determine what offers the system the best and most economic way of providing adequate voltage and capacity for the planning period. If the alternative results in greater capacity than needed but offers significant benefit to the system, then this alternative should be explained and justified thoroughly, especially if it is the preferred alternative. All alternatives should be assessed in this manner.

Once the cost-effective, preferred plan is determined, (usually 2) interim load level plans can subsequently be developed. Modifications to the system can thereby be made according to "as needed" load levels, transitioning gradually from the current conditions to the long range load forecasted.

The bottom line is that planning engineers should develop reasonable and approximately equivalent long range alternatives in order to determine the most economical and practical preferred plan for the system. Then the alternative plans, including the engineer's recommended plan, can be presented to the system's owners (Board of Directors) for evaluation and selection of the best plan to satisfy the long-range needs of the electric system.

This article is a collaborated contribution of the NRECA's Transmission and Distribution Engineering Committee's System Planning Subcommittee and RUS staff. If you would like more information or have any questions, please contact Chris Tuttle, Economist, Energy

Forecasting Branch and the RUS liaison member on the System Planning Subcommittee, at 202-205-3655 or at Chris.Tuttle@usda.gov.

## Developments in Wind Energy

A number of RUS borrowers have recently decided to include wind power in their resource mix. Generation and Transmission (G&T) coops' power purchase agreements for renewable energy now total 191 MW, with 185 MW from wind power resources. Recent power purchase agreements include those of Basin Electric Cooperative (Basin) of Bismarck, ND, and its purchase of the output of two 40 MW wind farms, one in each of the Dakota's, under development by FPL Energy. Western Farmers Electric Cooperative of Anadarko, OK, has agreed to purchase 74 MW of wind power from the Blue Canyon project located just north of Lawton, OK. Blue Canyon will be co-owned by Zilkha Renewable Energy of Houston, TX, and Kirmart Corporation of Wichita Falls, TX. Sunflower Electric Power Corporation of Hays, KS, has also agreed to purchase the first 30 MW of an approximate 100 MW wind farm in Leoti, KS, being developed by Renewable Energy Systems of St. Albans, England. All of these purchase agreements will be effective on or before year end 2003.

Ownership of wind power resources, while expanding, has thus far been pursued less aggressively by RUS borrowers. This is in large part due to the inability of cooperative power suppliers to fully utilize Federal production tax credits currently offered for wind and other renewable energy production. In spite of this drawback, there have been small direct investments in utility scale wind power. Minnkota Power Cooperative of Grand Forks, ND, owns and operates two 900 kW NEG Micon wind turbines. Additionally, Basin has developed two small wind projects in Chamberlain, SD, and Minot, ND, totaling 5.2 MW. Each of Basin's projects consists of two 1300 kW Nordex wind turbines.

To date, RUS has approved two loans for wind projects. The first RUS approved wind loan was for the Basin/East River Electric Power Cooperative (of Madison, SD,) project at Chamberlain, SD. The second wind energy loan approved by RUS went to a new borrower, the Rosebud Sioux Tribe of Rosebud, SD. The Rosebud project consists of a single NEG Micon 750 kW turbine. The US Department of Energy (DOE) was also a partner in this project through a grant for approximately 50% of project cost.

RUS staff is working in several areas to help borrowers become more familiar with issues in wind energy. We are participating in DOE/NRECA sponsored regional workshops on wind energy, the most recent of which was hosted by Tri-State G&T in Denver, CO, on April 14-15, 2003.

The next DOE/NRECA Wind Energy Workshop will be held October 14-15 in Huron, SD, at the Crossroads Hotel. On the afternoon of October 15, workshop participants will have the opportunity to tour the 40-MW Basin/FPL wind facility, which is about 50 miles away. Topics to be covered at this workshop will include:

- Real wind energy economics
- Real wind energy hurdles

- How to conduct a wind energy feasibility study
- Building a business case for wind financing (RUS)
- Understanding coop member demand for wind power
- How to market green power to coop members
- Impacts of distributed wind applications on the utility grid
- Small and large wind technology trends, operation, and maintenance
- State and Federal Incentives available to coops for wind development
- Description of NRECA's wind research program initiatives

This one and a half day workshop will provide the practical information coops need to identify and understand regional market opportunities in the near term, and to realistically assess wind energy's potential contribution in the future. Watch the NRECA/CRN calendar of events for more information on this workshop. Further, please see the item in this publication regarding the upcoming RUS Engineering Seminar, which will include a half day session on renewables including wind energy.

RUS is also working with NRECA, the DOE Wind Powering America Program, and AWS Scientific to develop a Wind Project Business Plan Model to be used to support wind project financing. A draft outline of the Wind Project Business Plan is provided below.

<u>Wind Project Business Plan</u>

- Project Overview
  - Project Participants
  - Site Location
  - Unit Size and Total Capacity
  - Development Timeline
- Technical Issues / Construction Work Plan
  - Wind Resource Assessment
  - Engineering
  - Project Design / Siting
  - Manufacturer Selection / Construction Contract
  - Interconnection / Transmission Availability
  - O&M
  - Maintenance Schedule
  - Major Component Replacement

- Legal/Environmental Issues
  - Property Entitlements/Access Restrictions
  - Wholesale Power Contract (WPC)
  - Warranty / Turbine Performance
  - Permitting Issues
  - Environmental Requirements (ER, EA, EIS)
- Financial Support
  - Load Forecast / Market Survey
  - Power Purchase Agreement / WPC
  - Federal / State Incentives
  - Green Tags
  - Project Pro Forma / System Financial Forecast
  - Loan Term

If you would like more information or have any questions, please contact Chris Tuttle, Economist, Energy Forecasting Distribution Branch, at 202-205-3655 or at Chris.Tuttle@usda.gov.

# NATIONAL ELECTRICAL SAFETY CODE

## Help Develop the 2007 Edition of the National Electrical Safety Code

NESC Importance - The National Electrical Safety Code (NESC) is an extremely important document for all utility companies, including electric utilities. The NESC is an American National Standards Institute (ANSI) standard that covers the basic provisions for safeguarding the public and utility personnel from hazards arising from the installation, operation and maintenance of: (1) conductors and equipment in electric supply stations, and (2) overhead and underground electric supply and communications lines. The document includes work rules for the construction, maintenance and operation of electric supply and communications lines and equipment. This is one of the key documents always referred to in court cases involving accidents related to electric or communications utility facilities. It is also important to Rural Utilities Service (RUS) borrowers because RUS, as do most State authorities, requires borrowers to design, install, operate, and maintain electric facilities in conformance with the NESC. The NESC is such a crucially important safety document to RUS borrowers that RUS staff members participate on the bodies that maintains the document.

C2 Secretariat - The Institute of Electrical and Electronics Engineers, Inc., (IEEE) through its C2 Committee is the ANSI Secretariat responsible for maintaining the NESC. The

C2 Committee performs its duties via seven subcommittees consisting of balanced numbers of volunteer engineers and individuals from other technical and non-technical fields all representing utilities, manufacturers, government agencies, professional societies and associations, and unions. RUS maintains membership on the Main Committee and four of the seven subcommittees: Grounding Methods, Overhead Lines-Clearances, Overhead Lines-Strength and Loading, and Underground Lines. In this capacity, RUS is able to follow the direction that NESC changes take and can better help to assure that the rural utility concerns are appropriately considered in final, approved, revised editions.

Proposed NESC Change Submittal Phase – The C2 Committee is now in the process of developing the 2007 Edition of the NESC and those involved in the design, construction, operation, and maintenance of rural electric facilities can take part in the development of the 2007 edition. Up until July 17, 2003, the C2 Secretariat accepted proposals from the public to change the current edition of the NESC (the 2002 Edition). People that work in the rural electric utility industry use this opportunity to assist themselves and their organizations by writing and submitting change proposals to help correct omissions, errors, or other problems that they have encountered in using the 2002 Edition of the NESC. Although this portion of the revision process is completed, there is still opportunity to help and that is reviewing and providing comments on the subcommittees' proposals described further on here.

Change Proposals –The C2 Secretariat requires NESC change proposals to be submitted to it on a standardized form that it has developed. The form helps to make the committee and subcommittee review manageable and timely. The form can be found on Page 281 of the 2002 NESC. Copies of the NESC can be obtained from the IEEE at 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331 or by telephone at 1-800-678-IEEE. Ask for C2-2002, "National Electrical Safety Code (2002)." Although the deadline for submitting change proposals has passed, we are providing details on how change proposals have to be submitted for future reference when work begins on the 2012 edition of the NESC.

The following time schedule has been established to complete the 2007 revision:

| | |
|---|---|
| September & October, 2003 | NESC Subcommittees meet to consider all the change proposals submitted by the public |
| September 1, 2004 | The Secretariat publishes the "Preprint 2007 Proposals." This publication includes the Subcommittees' resolutions of the public comments and the amendments that Subcommittees produce as a result of the comments; these are the amendments the subcommittees propose for incorporation into the 2007 NESC. This is the time period when rural electric engineers and others involved with all aspects of the utility business covered in the NESC can provide immeasurable assistance in the process. You can review the Preprint 2007 Proposals and the subcommittees' resolutions of the public comments and where there are egregious provisions being proposed, you can provide comments of warning, offer remedy suggestions, etc., and otherwise help to improve the provisions for everyone's benefit. |
| May 1, 2005 | Deadline for the public and interested parties to submit comments concerning the subcommittees' proposed amendments published in the September 1, 2004, Preprint |
| October 2 through 20, 2005 | NESC Subcommittees meet to consider the public comments regarding the subcommittees' proposals published in the September 1, 2004, Preprint. |
| January 15, 2006 | The Proposed revision of the NESC that is prepared after considering the public comments is submitted to the NESC Main Committee for Ballot and to ANSI for concurrent public review. |
| May 15, 2006 | The NESC Main Committee approved revision of the NESC is sent to the American National Standards Institute (ANSI) for consideration as an ANSI standard. |
| August 1, 2006 | 2007 Edition of the NESC is published. |

For further information on the NESC please contact the following:

Main Committee: George Bagnall.....202-720-1900
Subcommittee 2, Grounding Methods: Harvey Bowles .....202-720-0980
Subcommittee 4, Overhead Lines-Clearances: Jim Bohlk .....202-720-1967
Subcommittee 5, Overhead Lines-Strength and Loading: Don Heald .....202-720-9102
Subcommittee 7, Underground Lines: Trung Hiu .....202-720-1877

## NESC Rule 239E2a1: Clearance of Open Vertical Conductors and Pole Surface

Rule 239E2a1 has been changed from previous editions of the National Electrical Safety Code (NESC). This rule specifies the clearance of open vertical supply conductors to the surface of

the pole. Previous editions of the NESC specified vertical conductor distances to the center of the pole, which were generally 4 inches greater than the new clearances. The requirements of this rule need to be applied for the following two conditions:

- Workers ascend the structure (pole) in the "zone" where lateral or vertical supply conductors are installed while the conductors are energized (NESC Rule 239E2). The structure "zone" is defined in NESC Table 239-2 as a distance 6 feet above and below where the vertical or lateral conductors are installed, and,

- Open line conductors are within 4 feet of the (surface of) pole (NESC Rule 239E2a).

If either of the above conditions is true, then vertical conductors are required to have the following clearances to the face of the pole as per NESC Table 239-2:

| | |
|---|---|
| 0 to 22 kV (phase to ground): | 19 inches |
| 22 to 30 kV (phase to ground): | 22 inches |
| 30 to 50 kV (phase to ground): | 30 inches |

In the previous edition of the NESC the required distance to the center of the pole for voltages less than 8.7 kV was 15 inches and the "zone" was 4 feet above and below the conductors. Also, the required distance to the center of the pole for voltages between 8.7 kV and 16 kV was 20 inches.

If you would like more information or have any questions, please contact James Bohlk, Electrical Engineer, Distribution Branch, at 720-1967 or at Jim.Bohlk@usda.gov.

## NESC Interpretations Involving Section 26

**IR 520** - Interpretation Request 520 in July 2000, involved longitudinal strength requirement for crossarms required to meet National Electrical Safety Code (NESC) Grade B strength requirements. NESC requires single crossarms to sustain a longitudinal tension of 700 lbs. applied at the outer attachment point regardless of the actual tension of the line. The question regarding this strength requirement involved a three phase line in which each line conductor exceeded 2000 lbs. The question follows:

*Is it the intention of the NESC that the Grade B crossarm (if doubles are used, each crossarm) have a strength proportional to the tension increase over 2000 lbs. (i.e., for a 3000 lb. line the required longitudinal strength required be 700 x 3000/2000 = 1050 lbs. at the outer attachment point?*

The response from the NESC interpretations committee follows:

*Wooden crossarms must meet both a) actual loadings as stated in Rule 261D2a(1), and b) a minimum of 700 lbs applied at the outer attachment point as stated in Rule 261D4a(1)(a). In other words, wooden crossarms must meet the greater of Rule 261D2a(1) or Rule 261D4a(1)(a) loadings. Both rules apply to both Grade B and Grade C construction.*

*It is not intended that Rule 261D4a(1) strength requirements be increased on a proportional basis where conductor tensions exceed 2000 lbs. For conductor tensions above 2000 lbs., no particular construction is specified as being considered to meet the requirements of the rules; it is the designer's responsibility to ensure compliance with the fiber stress limit. See IR376, November 6 1985.*

**IR 530** - Interpretation Request 530 in September 2002, involved NESC Rule 261D2a(2). This rule states that the permitted stress level of solid sawn wood crossarms shall be determined by multiplying their ultimate stress by the strength factors in Table 261-1A or Table 261-1B. The question follows:

*For Grade C wood crossarm construction using Table 261-1A, does one use the strength factor for "Wood and Reinforced-Concrete Structures" or does one use the strength factor for "Support Hardware"?*

The response from the NESC interpretations committee follows:

*Row 2 of Table 261-1A (2002 Edition), 'Wood and Reinforced Structures,' should be used to determine strength for solid sawn wood crossarms.*

NESC interpretations can be found on the NESC web site at:

**http://standards.ieee.org/nesc/interpretations.html.**

If you would like more information or have any questions, please contact Donald Heald, Structural Engineer, Transmission Branch, at 202-720-9102 or at Don.Heald@usda.gov.

## An Update to Possible Changes to Sections 26 and 27 of the 2002 NESC

The deadline for submitting proposed changes to the 2002 NESC from the public was July 17, 2003. Various working groups within NESC Subcommittee 5, Strengths and Loadings, are continuing their efforts in developing changes to the 2002 edition of the code for 2007.

A Complete Rewrite of Sections 25-27

A complete rewrite of the strength and loading sections (Sections 25–27) will be proposed. The change proposal will attempt to introduce this rewrite as (1) a replacement to the respective sections in the 2002 edition, or (2) an alternate method in the 2007 edition.

Incorporation of a New 50 Year Combined Ice/Wind Map

Several change proposals will probably include the 50 year combined ice and wind map. This map is currently in the SEI/ASCE 7-02 standard, "Minimum Design Loads for Buildings and Other Structures" (Revision of ASCE 7-98). The radial ice indicated on this map may be greater than that presently specified by the Loading Districts currently in the NESC. In some areas of the country the radial ice may be less.

While considering this map to be included in the NESC, Subcommittee 5 has to consider other impacts. Changes to Section 23 may be necessary, depending on whether or not the Light, Medium, and Heavy District loads remain in Section 26. Rule 277, Mechanical Strength of Insulators, may have to be altered to consider the strength of insulators with respect to the 50 year combined ice/wind map.

Subcommittee 4 (Overhead lines–Clearances) established Working Group (WG) 4.10 to investigate the corresponding impact on sag and clearance issues, and to develop appropriate change proposals compatible with the possible introduction of the new combined ice/wind map and the new method as developed in the complete rewrite of Sections 25-27 of the NESC. Incorporation of the new ASCE 7 ice/wind map would have a major impact on sag and clearance issues for both distribution and transmission facilities, depending upon the geographic area, span length, and conductor. Several possible options were discussed for addressing this critical issue within WG 4.10 and Subcommittee 4.

ANSI O5.1, Wood Poles – Specification and Dimensions:

The 2002 Edition of the NESC references ANSI O5.1-1992, "American National Standard for Wood Products-Specifications and Dimensions," as the standard to use to obtain the designated fiber stress of a wood pole. In the 1992 Edition of ANSI O5.1, an equation for decreasing fiber stress with height is included in the appendix and as such, is not a (required) part of the standard. The 2002 Edition of ANSI O5.1 includes the equation in the body of the standard and is now a requirement of the standard. The NESC will be considering updating the reference to this standard from the 1992 edition to the 2002 edition. If the NESC changes the date of the referred standard in Rule 261A.2.b to reference the 2002 ANSI O5.1 standard, all wood pole designs will have to consider decreasing fiber stress with height. This change may be significant if the NESC removes 'EXCEPTION 1' to Rule 261A.2.a. This rule states "When installed, naturally grown wood poles acting as single-based structures or unbraced multiple-pole structures, shall meet the requirements of Rule 261A2a without exceeding the permitted stress level at the ground line for unguyed poles or at the points of attachment for guyed poles."

60-Foot Exclusion

Subcommittee 5, Strengths and Loadings, established a working group to revisit the 60-foot height limit for extreme winds in the 2002 NESC. Rule 250C, Extreme Wind Loading, states:

"If no portion of a structure or its supported facilities exceeds 60 ft above ground or water level, the provisions of this rule (Extreme Wind Loading) are not required, except as specified in Rule 261A1c or Rule 261A2f."

The original change proposal to the 1997 edition of the NESC was to remove the 60 foot exclusion from Rule 250C. Comments from the public and from members of the committee seem to indicate that removal of the 60 foot exemption would not necessarily increase safety and reliability. During extreme wind events, debris is blown into overhead line facilities (especially those under 60 feet), which has a more dramatic affect on the line than does extreme wind. Removal of this exemption ignores this problem while imposing a possible costly solution. However, the subcommittee recognizes that wind blows below 60 feet and has asked this

working group to develop a position that would accommodate both opinions for the 2007 Edition of the NESC. The working group is considering the following:

- Alter Table 253-1. For Rule 250C Loads show overload factors of 1.00 for Grade B construction and 0.87 for Grade C construction. This change proposal is to distinguish Grade B and Grade C construction for the extreme wind loads.

- Remove the 60 foot exclusion from Grade B construction.

- Remove the 60 foot exclusion from Grade C construction and show a maximum extreme wind load of 15 psf for Grade C construction under 60 feet. A second option was to establish the maximum wind load of 15 psf for wind loads greater than 90 mph and 10 psf for wind loads 90 mph or less.

For other information, the NESC web site is:

**http://standards.ieee.org/nesc/index.html**

If you would like more information or have any questions, please contact Donald Heald, Structural Engineer, Transmission Branch, at 202-720-9102 or at Don.Heald@usda.gov.

# MATERIALS and EQUIPMENT

## U-1 Specification Revision

RUS is in the process of revising RUS Bulletin 50-70 (U-1), "RUS Specification for 15 kV and 25 kV Primary Underground Power Cable." The revised bulletin will be renumbered RUS Bulletin 1728F-U-1 and be renamed, "RUS Specifications for 15 kV, 25 kV, and 35 kV Primary Underground Power Cable." The bulletin is being revised to keep abreast of current primary insulated cable technology. The U-1 Bulletin will provide RUS specifications on 15 kV, 25 kV and 35 kV primary underground cables. We expect to issue a proposed rule in the *Federal Register* later this year.

Highlights of the changes that will be proposed include:

- A water blocking sealant would be required in all stranded conductor cables.

- Plain cross-linked polyethylene (XLP) would be removed and be replaced by cross-linked polyethylene with tree-retardant (XLP-TR) as an acceptable insulation material.

- Nominal insulation thickness on 25 kV cable would be reduced from 345 mils to 260 mils.

- A 35 kV rated cable would be included as an RUS acceptable operating voltage for underground residential distribution cable and the specifications for this voltage rating would be included in the revised bulletin.

- A semi conducting jacket will be specified in the proposed bulletin and it is intended to be used on cables to be installed in areas with soil resistivities greater than 2500 ohm-centimeters in lieu of insulating jacket.

If you would like more information or have any questions, please contact Trung Hiu, Electrical Engineer, Distribution Branch, at 202-720-1877 or at Trung.Hiu@usda.gov.

## Marking & Identification of Equipment & Materials

The Electric Staff Division continues to receive questions related to the lack of markings for identification of equipment and materials used on RUS construction projects.

Domestically manufactured equipment and materials included in RUS Informational Publication 202-1 "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers" are required to have an identifying mark located on the product in order to be qualified for acceptance and listing. The markings are required to be a catalog number, part number or a manufacturer's logo. Non-domestically manufactured equipment and materials that are granted RUS technical acceptance (1 year and the manufacturer has to resubmit for continued Technical acceptance annually or the technical acceptance expires) must be properly marked just like domestically manufactured RUS accepted products in the list of materials.

The markings of materials must be in the form of a permanent type, such as cast, indented or embossed in the item. Marking products with permanent pens is not an acceptable method of product identification. The embossed method, which is applied during the manufacturing process, is one of the more preferred identifying methods used by manufacturers.

The ability to identify equipment and materials that fail is a vital to maintaining the reliability of the distribution system. The manufacturer of an item that fails to provide adequate service life is more easily identified when the user has product identification numbers or other permanent markings to assist them. Products that fail and don't have manufacturing markings are usually products that were purchased from sources that have not gone through the RUS evaluation process and thus never had RUS acceptance. Generally, failed products with no identifying marks are usually questionable and, in many cases, sub-standard.

An item with no identification marking should raise the question as to whether it is an RUS accepted item and be subject to further investigation. Items such as smaller size washers are not required to have identification or manufacturing markings but all other material and equipment included in the list of materials are required to have an identifying mark. Bolts that have not received RUS Acceptance which have failed in service are an example of an item that has been proven to be of inferior design and strength characteristics. Bolts that RUS has received from borrowers that had no markings on them in many cases did not meet the strength requirements or rated torque values when tested.

If you would like more information or have any questions, please contact George Keel, Equipment Specialist, Distribution Branch, at 202-690-0551 or at George.Keel@usda.gov.

## Proposed Bulletin 1724E-220, Procurement and Application Guide for Non-Ceramic Insulators, Voltage Class 34.5 kV and Above

While most, if not all, utilities are experts on the use of ceramic insulators, utilities are in a learning mode when it comes to use of non-ceramic insulators. Over the years, non-ceramic insulator use has steadily increased. In the same time frame, changes made in the manufacturing processes to produce non-ceramic insulators have been continual. There have been vast improvements from the first generation non-ceramic insulators to those on the market today.

RUS, with the help of the NRECA Transmission Line Subcommittee, is working on a guide to aid in the process of specifying and procuring non-ceramic insulators with development of RUS Bulletin 1724E-220, "Procurement and Application Guide for Non-Ceramic Insulators, Voltage Class 34.5 kV and Above." This guide is being proposed to simplify the procedure in selecting and procuring non-ceramic insulators. Some of the topics that currently are proposed to be addressed in the guide include:

- Advantages and disadvantages of non-ceramic insulators,
- Materials,
- Electrical and mechanical considerations,
- Interchangeability with ceramic insulators and replacement,
- Environmental and quality assurance,
- Testing, and
- Handling

The majority of the information in the guide will be directed towards transmission suspension insulators but post and station post insulators will also be discussed. Also, included in the proposed guide will be a Sample Specification for non-ceramic insulators.

This guide is the result of considerable effort of the Transmission Subcommittee of the NRECA T&D Engineering Committee. Subcommittee members who worked on this bulletin include:

Dominic Ballard, East Kentucky Power Coop., Winchester, KY

John Burch, Florida Keys Electric Coop., Tavernier, FL

Donald Heald, USDA, Rural Utilities Service, Washington, D.C.

Bill Hetherington, Lee County Electric Coop., North Fort Myers, FL

Robert Johnson, Arkansas Electric Coop., Little Rock, AR

Charles Lukkarila, Great River Energy, Elk River, MN

Charles McCall, Georgia Transmission Company, Tucker, GA

Robert Oldham, Southern Maryland Electric Coop., Hughesville, MD

Art Smith, Patterson & Dewar Engineers, Decatur, GA

David Turner, Lower Colorado River Authority, Austin, TX

John Twitty, Alabama Electric Coop., Andalusia, AL

If you would like more information or have any questions, please contact Don Heald, Structural Engineer, Transmission Branch at 202-720-9102 or at Don.Heald@usda.gov, or Norris Nicholson, Electrical Engineer, Transmission Branch at 202-720-1924 or at Norris.Nicholson@usda.gov.

## Selecting the Best Current and Voltage Transformers

Selecting current transformers (CT's) and voltage transformers (VT's) for your metering applications should not be based solely on the lowest price or on their good output capability and accuracy. You should also double check your purchase specifications for CT's and VT's operational performances and your installation practices for these devices. It does not matter how good the output capability and accuracy of a CT or VT is when it comes off the production line as operational performance can be ruined by inappropriate application and poor installation practices.

In selecting your CT and VT, the lowest price may not be the best value. Selecting the next higher burden (load) capability than is required may result in higher cost, but the improved accuracy will most likely result in additional metering revenue and will pay back the additional cost within a short time.

IEEE/ANSI Standard C57.13, Table 9, "Standard Burdens for Current Transformers with 5 A Secondary," lists CT burdens in units of ohms but the table also lists CT burdens in units of equivalent volt-amperes (VA) and power factor. Where use of a VT will be such that the burden margin is low; it is best to calculate the VT's secondary burden using both VA and power factor. Keep in mind that the connecting leads are often the major burdens (load) for the CT secondary. As a rule of thumb, think of an ohm as equal to 1000 feet of No.10 AWG copper wire. For example: a total of 1800-feet of No. 10 AWG wire leads attached to a CT secondary would fully

load a 1.8 ohm rated CT. 100-foot long connecting leads on each terminal would cause a CT rated at a 0.2 ohms burden to be at its maximum.

Users are encouraged to know the standards and how to select CT's and VT's for both standard and non-standard applications.

If you would like more information or have any questions, please contact Theodore V. Pejman, Electrical Engineer, Transmission Branch, at 202-720-0999 or at Ted.Pejman@usda.gov.

## Improve Revenue Streams by Offering Prepay Metering to Your Customers

Utilities may improve their revenue collections by using a prepayment metering system. By customizing a prepayment metering system, utilities can find new sources of revenue streams, reduce operating cost, and allocate costs more effectively. Prepayment metering systems will allow utilities to receive their money up front, and improve profitability by reducing costs related to invoicing, reminders, meter tampering and eventually eliminating bad debt collections. The prepayment system is very effective when customers are remotely located and disconnecting/ reconnecting services for none payment becomes unfeasible.

Customers using prepayment metering systems will benefit from controlling their power usage according to their budget. They are not required to put down deposits, they will not receive a surprise bill at month's end, and they can save 5-20% by using energy wisely within the utility's customized non-peak rate discount provisions that are part of most prepayment systems. Additionally, they don't have to pay for disconnection/reconnection fees. Customers using a prepayment metering system have rated it very high on a satisfactory survey.

Advances in microchip and data communications technologies have made the prepayment metering systems more readily available and friendlier to use. Customers interested in a prepayment metering system have to sign up and meet minimum qualifications. After being approved to receive a prepayment system, the utility provides the customer with an account number, a prepaid Utility Card (UC), and a customer interface unit installed in their home. The UC is similar to an ATM card and when inserted into the interface unit it will automatically debit the customer's bank account for a dollar amount specified by the customer.

The prepayment system is convenient, simple and saves money for utilities and their customers.

If you would like more information or have any questions, please contact Theodore V. Pejman, Electrical Engineer, Transmission Branch, at 202-720-0999 or at Ted.Pejman@usda.gov.

## A Zero Tolerance Policy on Ground Rods

In the past few years, we have had several discussions with ground rod manufacturers. As a result, we have learned that some ground rods are smaller than advertised and consequently do not meet the RUS Electric Program requirements that ground rods be in compliance with National Electrical Safety Code (NESC).

The RUS Electric Program requires that ground rods have a minimum cross-sectional dimension of 5/8" with a maximum negative tolerance of 1/32". Several manufacturers are producing ground rods that are a 5/8" "trade size." These ground rods have a cross-sectional dimension less than the RUS and NESC minimum.

The Distribution Branch is in the process of verifying the continued compliance of ground rods appearing on the List of Materials (pages ai-1 through ai-3). We are requesting that manufacturers verify the accuracy of their listings on the List of Materials and submit foot long sections of their accepted ground rods.

If you would like more information or have any questions, please contact Timothy Roscoe, Electrical Engineer, Distribution Branch, at 202-720-1972 or at Timothy.Roscoe@usda.gov.

## Kilowatt-Hour Meter Testing

Within the past year, RUS has received a number of requests asking for the recommended frequency of testing residential kilowatt-hour meters. The Electric Staff Division (ESD) recommends that residential kilowatt-hour meters be tested in accordance with state or local jurisdiction requirements. If there are no such requirements in place, ESD recommends that testing (and any needed calibration) be accomplished every 3 to 5 years as experience dictates.

Concerns about meters and their maintenance are contained in RUS Bulletin 1730-1, "Electric System Operation and Maintenance (O&M)." On Page 11 of Bulletin 1730-1 Exhibit A suggests that to deserve an Operations and Maintenance rating of "3," that all meters should be tested in accordance with state regulations (where applicable) or in accordance with American National Standards Institute (ANSI) Standard 12.1, "Electric Meters Code for Electricity Metering." This RUS bulletin also states that Potential Transformers (PT's), Current Transformers (CT's), and demand meters are generally tested on at least a 3 year cycle. A copy of RUS Bulletin 1730-1 can be down loaded off the RUS website at:

**http://www.usda.gov/rus/regs/bulls/1730-1.pdf**

If you would like more information or have any questions, please contact Timothy Roscoe, Electrical Engineer, Distribution Branch, at 202-720-1972 or at Timothy.Roscoe@usda.gov.

# ENVIRONMENTAL

## 7 CFR Part 1794 - Amendment to Environmental Policies and Procedures

RUS is pleased to announce the publication of its final rule amending its existing "Environmental Policies and Procedures," 7 CFR Part 1794. The rule was published in the *Federal Register* on August 1, 2003, which is also the effective date of the final rule. Until the new Code of Federal Regulations is published in January 2004, this final rule should be used in conjunction with the version of 7 CFR Part 1794 that was published in the *Federal Register* on

December 11, 1998. Two versions of this final rule are available on the RUS web site under "Electric Program Regulations" at:

**www.usda.gov/rus/electric/regs/index.htm**

The *Federal Register* version of the amended final rule (7 CFR Part 1794) can also be downloaded from the same RUS web site.

The amended final rule contains a variety of changes from the provisions of the current rule. Most of these revisions are minor or merely intended to clarify existing RUS policy and procedure and to ensure that procedures are consistent among the three RUS programs. Other revisions expand upon the existing types of actions that are subject to environmental review or reclassify actions within categories. The more significant changes are discussed by section as follows:

§1794.6 Definitions:

A new definition has been added for the term "distributed generation", the term "Environmental Analysis" has been deleted, and the term "Environmental Report" has been expanded to include proposals listed under §1794.24.

Distributed Generation. The generation of electricity by a sufficiently small electric generating system as to allow interconnection of the system near the point of service at distribution voltages or customer voltages. A distributed generating system may be fueled by any source, including but not limited to renewable energy sources.

§1794.7 Guidance:

A new guidance bulletin, RUS Bulletin 1794A-603, "Scoping Guide for RUS Funded Projects Requiring Environmental Assessments with Scoping and Environmental Impact Statements," was issued in February, 2002. This bulletin provides guidance in preparing for and carrying out scoping for electric generation and transmission projects that require either an environmental assessment with scoping or an environmental impact statement.

§ 1794.15 Limitations on actions during the NEPA process:

The following language was added to this section in order to identify which RUS actions signal the completion of the RUS environmental review process:

(1) A categorical exclusion determination has been made for proposals listed under §§1794.21 and 1794.22.

(2) Applicant notices announcing the RUS FONSI determination have been published for proposals listed under §§1794.23 and 1794.24.

(3) Applicant notices announcing the RUS Record of Decision have been published for proposals listed under §1794.25.

§1794.21 Categorically excluded proposals without an Environmental Report:

(b) Electric and Telecommunications Programs.

RUS added separate categories for generating facilities of less than 100 kilowatts (Item 25) and the co-firing of bio-fuels and refuse derived fuels at existing fossil-fueled generating stations (Item 26).

(25) Electric generating facilities of less than 100 kilowatts at any one site for the purpose of providing service to customers or facilities such as stock tanks, oil wells, and irrigation pumps.

(26) New bulk commodity storage and associated handling facilities within existing fossil-fueled generating station boundaries for the purpose of co-firing biofuels and refuse derived fuel. A description of the facilities to be constructed shall be provided to RUS.

§1794.22 Categorically excluded proposals requiring an Environmental Report:

(a) Electric and Telecommunications Programs.

RUS modified the capacity thresholds for distributed generation facilities at existing sites (Item 8) and added a new category involving adding combined cycle facilities at existing combustion turbine sites (Item 12).

(8) Construction of distributed generation totaling 10 MW or less at an existing utility, industrial, commercial or educational facility site. There is no capacity limit for a electric generating facility located at or adjacent to an existing landfill site that is powered by refuse derived fuel. All new associated facilities and related electric power lines shall be covered in the ER.

(12) Installing a heat recovery steam generator and steam turbine with a rating of 200 MW or less on an existing combustion turbine site for the purpose of combined cycle operation. All new associated facilities and related electric power lines shall be covered in the ER.

§1794.23 Proposals normally requiring an Environmental Assessment

(b) Electric and Telecommunications Programs.

In addition to including fuel cell and combined cycle generation in the same listings as combustion turbines, RUS added two new categories of proposals within §1794.23. Item 12 involves a higher capacity threshold for adding combined cycle facilities at existing combustion turbine sites. Item 13 covers the construction of a natural gas pipeline to serve an existing gas-fueled generating facility. Other capacity threshold changes within §1794.23 reflect changes that were made in §1794.22(a).

(12) Installing a heat recovery steam generator and steam turbine with a rating of more than 200 MW on an existing combustion turbine site for the purpose of combined cycle operation. All new associated facilities and related electric power lines shall be covered in the EA.

(13) Construction of a natural gas pipeline to serve an existing gas-fueled generating facility.

Within §§1794.24 and 1794.25 the only change adds fuel cell and combined cycle generation in the same listing as combustion turbines.

In §§1794.43 and 1794.44, RUS has eliminated the requirement to publish in the *Federal Register*, a notice of Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) availability for electric and telecommunications proposed actions described in §1794.23. RUS determined that no appreciable benefit has resulted from publishing a separate *Federal Register* notice for proposals in that category. By this change, the notice requirements for all three RUS programs are now consistent for EA proposals described in §1794.23. Electric proposals described in §1794.24 would still be subject to the FONSI notice requirement in the *Federal Register*.

RUS has modified its policy regarding the use of a contractor prepared Environmental Impact Statement (EIS). As currently stated in §1794.61(b), the EIS would either be developed by RUS from an applicant prepared Environmental Analysis (EVAL) or prepared with the assistance of a consultant selected by RUS. Based on its experience in recent years, RUS expects to utilize the services of a consultant selected by and working for RUS for all actions requiring the preparation of an EIS. RUS does not contemplate preparing a draft or final EIS relying on an applicant prepared EVAL and has deleted §1794.61(b) in this final rule. Also, the applicant submitted document for all proposals will be titled an Environmental Report (ER). Previously, the applicant supplied document for a §1794.24 proposal was an EVAL. These changes affect §§1794.50, 1794.52 through 1794.54, and 1794.61.

If you would like more information or have any questions, please contact Larry Wolfe, Senior Environmental Protection Specialist, Engineering and Environmental Staff, at 202-720-5093 or at Larry.Wolfe@usda.gov.

## Oil Spill Prevention, Control, and Countermeasure Plan

On July 17, 2002, the Environmental Protection Agency (EPA) published its new Oil Pollution Prevention Rule, replacing one that had been in effect since January 10, 1974. It was published under the authority of Section 311(j)(1)(C) of the Federal Water Pollution Control Act (Clean Water Act). The regulation may be found at Title 40, Code of Federal Regulations, Part 112 (40 CFR 112).

The new rule raises the facility volumetric regulatory threshold to 1320 gallons of above-ground oil storage capacity, dropping the old 660 gallon threshold for a single unit. (See

§112.1(d)(2)(ii).) In addition, EPA has adopted exemptions from the Spill Prevention, Control, and Countermeasure (SPCC) rules for several classes of units:

- Containers of oil below 55 gallons;
- Permanently closed containers;
- Underground storage tanks regulated under the Resource Conservation and Recovery Act (RCRA) Subtitle I and the Part 280 and 281 rules; and,
- Facilities used exclusively for wastewater treatment.

These units are not included in calculating the storage capacity of a facility in determining whether an SPCC plan is required. §112.1(d)(2) & (4).

Facilities subject to the rule must prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States or ad-joining shorelines. The plan is called a Spill Prevention, Control, and Countermeasure (SPCC) Plan.

Electrical Equipment

There is no doubt that the number one issue in this rulemaking for the electric utility industry is the regulatory status of oil-filled electrical equipment. As EPA tends to do in cases involving the scope of the Agency's regulatory jurisdiction, it takes an expansive position on the jurisdictional question and then adopts specific regulatory provisions to provide the regulated community with greater flexibility and, in some cases, options for exemptions or waivers from specific requirements. That is what EPA did here:

- Oil filled electrical equipment is subject to the Agency's SPCC jurisdiction. EPA amended the section that describes the activities that trigger SPCC regulation by inserting the word "using" before the phrase "oil and oil products." (See §112.1(b).) Equipment that would be regulated includes, for example, transformers, capacitors, and underground cable systems.

- Operational use of oil is distinguished from bulk storage of oil. Electrical equipment is expressly excluded from the definition of "bulk storage container." (See §112.2.) The effect of this exclusion is that electrical equipment is not subject to, among other things, secondary containment for bulk storage containers and periodic integrity testing and inspection requirements. (See §112.8(c).)

  Nevertheless, electrical equipment remains subject to the general requirement for appropriate containment and/or diversionary structures or equipment to prevent a discharge. That includes dikes, berms, retaining walls, curbing, booms, drainage systems, spill diversion ponds, and sorbent materials. (See §112.7(c).) As under the current rule, manmade structures that provide containment may not be considered in determining whether the facility is subject to the SPCC rule. (See §112.1(d)(1)(i).) If the certifying professional engineer determines that installation of such structures is not "practicable", that conclusion must be explained in the plan and the facility

owner/operator may rely instead on a contingency plan and provide a written commitment of manpower, equipment and materials to expeditiously address any harmful discharge of oil. (See §112.7(d).) Although economic "impracticability" cannot be used to justify departure from the general containment and/or diversionary structures or equipment requirement, physical or safety constraints (such as fire hazards) may provide a justification for reliance on contingency plan alternative.

- EPA continues to evaluate whether the above general containment requirements should be modified for small electrical equipment and commits to publish an advance notice of proposed rulemaking soliciting public comment whether such requirements should be modified and what should constitute "small" electrical equipment. (See 67 Fed. Reg. at 47055 and 67 Fed. Reg. at 47060, 47074.)

Definition of Facility

One area of possible flexibility, particularly for off-site electrical equipment, may arise from the new definition of "facility." After stating that equipment can be a facility, the new rule states that the "boundaries of a facility depend on several site-specific factors, including, but not limited to, the ownership or operation of buildings, structures, and equipment on the same site and the types of activity at the site." (See §112.2.) The professional engineer will have an opportunity to determine whether multiple pieces of equipment at the same location, with each piece of equipment containing less than 1320 gallons of oil storage capacity, are sufficiently separate that they can be fairly described as separate facilities, none of which have oil storage capacity above the regulatory threshold of 1320 gallons.

Who Prepares the SPCC Plan?

Preparation of the SPCC Plan is the responsibility of the facility owner or operator, but it must be certified by a licensed Professional Engineer (PE). By certifying the SPCC Plan, the Professional Engineer, having examined the facility, attests that:

1) The engineer is familiar with the requirements of part 112;

2) The engineer or its agent has visited and examined the facility;

3) The Plan has been prepared in accordance with good engineering practices, including consideration of applicable industry standards, and with the requirements of part 112;

4) Procedures for required inspections and testing have been established; and,

5) The Plan is adequate for the facility.

How do I Determine if My Facility Could Reasonably Discharge Oil Into or Upon Navigable Waters or Adjoining Shorelines?

This determination is based solely upon a consideration of the geographical and locational aspects of the facility. The location of the facility must be considered in relation to streams,

ponds and ditches (perennial or intermittent), storm or sanitary sewers, wetlands, mudflats, sand flats, or other navigable waters. The distance to navigable waters, volume of material stored, worst case weather conditions, drainage patterns, land contours, soil conditions, etc., must also be taken into account.

In addition, according to the rule, this determination may NOT include consideration of man-made features such as dikes, equipment or other structures which may serve to restrain, hinder, contain or prevent an oil discharge.

What do I Have to do Now?

A facility which meets the four criteria described above must comply with the SPCC rule. The SPCC rule requires the owner or operator of a facility existing before August 16, 2002, to amend, if necessary, the SPCC Plan on or before February 17, 2003, and to implement the amended Plan by August 18, 2003. On April 10, 2003, EPA Administrator Whitman signed a final rule extending the compliance dates in §112.3(a) and (b) by 18 months. Thus, the deadline for amending existing SPCC plans is now August 17, 2004, and the date for implementing those plans is now February 18, 2005. Most if not all existing plans will at least have to be re-certified (signed) by a PE, because the certification statement was changed in the July 2002 regulations.

The owner or operator of a facility that becomes operational after August 16, 2002, through August 18, 2003, must prepare and implement a Plan on or before August 18, 2003. The owner or operator of a facility which becomes operational after August 18, 2003, must prepare and implement a Plan before beginning operations. This Plan must be prepared in accordance with good engineering practices.

No matter who prepares your SPCC Plan, remember that ultimately it is the owner or operator who is responsible for complying with the rule. A copy of the rule is available on EPA website at http://www.epa.gov/oilspill/. You may also call or write to the nearest EPA office listed on the following page.

Although each SPCC Plan is unique to the facility, there are certain elements that must be included in order for the SPCC Plan to comply with the provisions of 40 CFR 112. Three areas which should be addressed in the Plan are:

1) Operating procedures the facility implements to pre-vent oil spills;

2) Control measures installed to prevent oil from entering navigable waters or adjoining shorelines; and,

3) Countermeasures to contain, cleanup, and mitigate the effects of an oil spill that has an impact on navigable waters or adjoining shorelines. Some other important elements of an SPCC Plan include, but are not limited to, the following:

    - Professional Engineer certification
    - Plan must follow the sequence of 40 CFR 112.7 or provide cross-references to the requirements in 40 CFR 112.7

- Facility diagram
- Oil spill predictions
- Facility drainage
- Facility inspections
- Site security
- Five-year plan review
- Management approval
- Appropriate secondary containment or diversionary structures
- Loading/unloading requirements and procedures for tank car and tank trucks
- Personnel training and oil discharge prevention briefings
- Brittle fracture evaluations
- Bulk storage container compliance
- Transfer procedures and equipment (including piping)

If you would like more information or have any questions about this article, please call Jim Stine, Sr., NRECA, Environmental Manager (Water & Solid Waste Issues) at 703-907-5739 or at james.stine@nreca.org, or Mike Eskandary, Electrical Engineer, Transmission Branch, at 202-720-9098 or at Mike.Eskandary@usda.gov.

Whom Should I Contact if I Want More Information?

If you have questions regarding the U.S. EPA, SPCC Program, please call or write:

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|---|---|---|
| U.S. EPA Headquarters<br>Director, Oil Program (5203G)<br>Ariel Rios Building<br>1200 Pennsylvania Avenue<br>Washington, DC 20460<br>703-603-8760 | SPCC/FRP Coordinator<br>U.S. EPA Region IV<br>61 Forsyth Street<br>Atlanta, GA 30365-3415<br>404-562-8768<br>AL, FL, GA, KY, MS, NC, SC, and TN | Oil Program Coordinator<br>U.S. EPA Region VIII<br>(8EPR-SA)<br>999 18th Street, Suite 500<br>Denver, CO 80202-2466<br>303-312-6839<br>CO, MT, ND, SD, UT, and WY |
| SPCC/FRP Coordinator<br>U.S. EPA Region I (HBR)<br>One Congress Street, Suite 1100<br>Boston, MA 02114-2023<br>617-918-1265<br>CT, ME, MA, NH, RI, and VT | Oil Program Section Chief<br>U.S. EPA Region V (SE5J)<br>77 West Jackson Boulevard<br>Chicago, IL 60604-3590<br>312-353-8200<br>IL, IN, MI, MN, OH, and WI | Oil Team/SPCC Coordinator<br>U.S. EPA Region IX (SFD1-4)<br>75 Hawthorne Street<br>San Francisco, CA 94105<br>415-972-3075<br>AZ, CA, HI, NV, AS, and GU |
| SPCC Coordinator<br>U.S. EPA Region II (MS211)<br>2890 Woodbridge Avenue<br>Building 209<br>Edison, NJ 08837-3679<br>732-321-6654<br>NJ, NY, PR, and USVI | SPCC/FRP Coordinator<br>U.S. EPA Region VI (6SF-RO)<br>1445 Ross Avenue<br>Dallas, TX 75202-2733<br>214-665-6489<br>AR, LA, NM, OK, and TX | SPCC/FRP Coordinator<br>U.S. EPA Region X (ECL-116)<br>1200 6th Avenue<br>Seattle, WA 98101<br>206-553-1671<br>AK, ID, OR, and WA |
| SPCC Coordinator<br>U.S. EPA Region III (3HS32)<br>1650 Arch Street<br>Philadelphia, PA 19103-2029<br>215-814-3292<br>DE, DC, MD, PA, VA, and WV | Oil/SPCC Coordinator<br>U.S. EPA Region VII<br>(SUPRER+R)<br>901 North 5th Street<br>Kansas City, KS 66101<br>913-551-7050<br>IA, KS, MO, and NE | Alaska SPCC/FRP Coordinator<br>U.S. EPA Alaska Operations<br>Office<br>222 West 7th Avenue, #19<br>Anchorage, AK 99513-7588<br>907-271-5083 |

## U.S. Fish and Wildlife Service National Wind Turbine Guidance

On July 2, 2003, the Department of the Interior cleared the U.S. Fish and Wildlife Service's (USFWS) voluntary national guidance for use on land-based wind turbines and wind farms for public release. The divisions of Federal Program Activities and Migratory Bird Management and the Wind Turbine Working Group announced the availability of interim voluntary wind turbine guidelines. The document is available at:

**http://www.fws.gov/r9dhcbfa/windenergy.htm**

From this site, click on the "Service Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines" (in adobe format). A Notice of Availability and Request for

Comments was published in the *Federal Register* on July 10, 2003. Public comments on the guidelines will be solicited from the public over the next two years. The guidance provides a detailed process for evaluating and ranking potential wind turbine sites, provides recommendations for pre- and post-construction monitoring, contains suggestions for construction and operation, addresses future research needs, and contains a detailed bibliography. The USFWS is encouraging industry to use these guidelines. Based partly on feedback from industry, consultants, and researchers, the guidance in major part is due to the efforts of the Service's Wind Turbine Siting Working Group that produced an initial draft in July 2002.

If you would like more information or have any questions, please contact Dennis Rankin, Environmental Protection Specialist, Engineering and Environmental Staff, at 202-720-1953 or at Dennis.Rankin@usda.gov.

## Generic Environmental Reports

A typical Four-Year Construction Work Plan (CWP) contains a mixture of projects falling within one of the following categories:

- Facilities where locations or routes can be specified.

- Facilities where locations or routes cannot be identified because construction will begin well after the beginning of the period covered by the CWP and precise location (i.e., substations and transmission lines) or need cannot yet be determined.

A generic presentation **should be used for only a compelling reason**. In a sense, generic treatment is a last resort where the alternative of a more detailed presentation is administratively or environmentally impractical. For example, while the precise route of a line to be built two years after the grant of RUS assistance may not be ascertainable at the outset, it may be possible to narrow the potential corridor or area sufficiently to permit environmental clearance. It is the intent of RUS that the maximum practicable amount of site-specific environmental review be accomplished prior to the grant of financial assistance.

The generic presentation should include the following:

- Project description
- Purpose
- Approximate location (state, county)
- Type of construction (overhead/underground)
- Right-of-way description (new/existing)
- Commitments:
    * As soon as the final location/route has been determined, a site-specific environmental report will be prepared.

* No site clearing/construction will start until the site-specific environmental report has been reviewed and approved by RUS.

**RUS cannot emphasize too strongly that applicant site clearing and construction cannot begin until a site-specific environmental report has been reviewed and approved by RUS.** Failure to observe this limitation likely would violate the Council on Environmental Quality Regulations (*i.e.,* 40 CFR §1506.1) and other statutory requirements and would jeopardize the ability of RUS to grant financial assistance for the project. Of course, it should be understood that when other prerequisite RUS approvals are required (*e.g.,* design, plans and specifications) no construction should begin until those approvals also have been made.

If you would like more information or have any questions, please contact Dennis Rankin, Environmental Protection Specialist, Engineering and Environmental Staff, at 202-720-1953 or at Dennis.Rankin@usda.gov.

## Environmental Data Base

In 1985, the Rural Electrification Administration (REA), the predecessor of the Rural Utilities Service (RUS), recommended that rural electric cooperatives establish an environmental data base with accompanying maps. The purpose of the data base was to expedite environmental approval of construction work plans and amendments, minor projects included in Inventory of Work Orders, environmental reports and other REA-funding requests by using a REA pre-approved data base. Several cooperatives established databases that were used for that purpose. Some data bases were put together by hand which was a labor intense, time-consuming process, while other cooperatives used a Geographic Information System (GIS) type mapping and management system. In addition GIS is also used for system/facilities mapping and as a planning and facilities maintenance tool. Many agencies also use a GIS based system to catalog and manage their environmental data and make data available to the public. Previously, the services of a consultant were required to implement a GIS based system and in some cases the cost was high. However, the cost of using a GIS based system has become more affordable and the access is more user friendly. The preparation of an Environmental Data Base (EDB) may help to expedite project review and approval, provide valuable information in siting facilities and generally give the cooperative an overall environmental picture of its service territory.

Generally there will be three components to the Environmental Data Base (EDB):

(1) A map or maps of the borrower's entire service area,

(2) Lists and tables, and

(3) Letters from or agreements with Federal and state agencies which are expert in or have jurisdiction by law on environmental matters.

Normally, the borrower will obtain the U.S. Geological Survey (USGS) maps or maps that cover its service area. In cases where there has been considerable development, other maps (e.g., country, street, and road) may be needed to augment USGS maps developed several years

ago. If floodplain maps from the Federal Emergency Management Agency are available, they should be obtained. In some regions important farmland and wetlands have been mapped. Using this collection, the borrower can draw or overlay the locations of many areas of environmental sensitivity. Map depictions are especially appropriate where the area of sensitivity is fairly large and has defined boundaries (e.g., Federal or state managed property).

Certain data does not lend itself readily to useful representation on maps. There may be so many historic and archeological sites that a map would show extreme clutter. Critical habitat for an endangered species may be so large and dispersed that map depiction has little meaning. Consequently, the borrower may find it most effective to keep some of the environmental data in the form of lists and tables. Care should be taken to insure that the location of borrower construction could be readily compared to the maps, lists and tables of areas of environmental sensitivity.

The third form of information contained in an EDB consists of letters from and agreements with Federal and state agencies. In a specific area, an agency may determine that the likelihood of impact for certain types of projects (e.g., line conversions) is so remote that it need not review such projects. Alternatively, the agency may give its blessing to a general type of construction so long as certain conditions are met (e.g., construction placed in road right-of-way). In effect, the interested agency has decided that there is no relevant environmental sensitivity tied to a type of construction. RUS should be a party to the understanding to make it binding. Moreover, if the agency conditions its blanket waiver on certain borrower mitigation measures, the borrower should include its response committing to the mitigation in the EDB.

The environmental information must be in a form such that the borrower, its consultant, RUS or another interested party can take a project located anywhere in the service area and readily determine whether or not it will be located in an environmental sensitive area.

In addition an acceptable EDB must process two other properties: valid information and completeness. To a great extent, the borrower and RUS must rely on interested agencies and publications for the accuracy of information in the database. However, the borrower does have considerable control over the currentness of the data. At a minimum, the borrower should update its EDB at the time each construction work plan is submitted. Ideally, the EDB should be modified whenever new relevant information comes to the borrower's attention. For example, the U.S. Fish and Wildlife Service may be willing to routinely notify the borrower of additions to the list of threatened and endangered species and critical habitat.

The EDB is complete if it: (1) addresses the borrower's entire service area, and (2) contains information on all relevant environmental factors. When a borrower seeks information from interested agencies, its request should clearly state that the entire service area is of interest, not merely certain projects at specified locations. The relevant environmental factors are those that would be relevant for a project-specific BER prepared within the service area.

Nearly all borrowers need to seriously consider the following environmental factors:

- Threatened and endangered species (including proposed) and critical habitat

- Floodplains
- Wetlands
- Important farmland, forest land and range land
- Cultural resources
- Airports and airfields
- Federally managed lands (i.e., BLM, FS)
- National parks
- National forests and grasslands
- Wildlife refuges and preserves
- National recreation areas
- Wilderness areas
- National monuments
- National historic landmarks
- National military and historic parks
- State managed lands
- Wild and Scenic Rivers system (including rivers in the national inventory)
- Coastal Barrier System units
- Land in the state's coastal zone
- National natural landmarks
- National trails
- Native American reservations

The above list contains major, commonly occurring environmental items that may be encountered by a borrower. However, the list is not necessarily exhaustive. Other factors should be included in the EDB if deemed relevant by the borrower or RUS. The borrower should document the sources of information used to develop the EDB. If the borrower finds that a certain environmental factor has no relevance within its service area, the basis for that assessment also should be documented.

If you would like more information or have any questions, please call Dennis Rankin, Environmental Protection Specialist, Engineering and Environmental Staff at 202-720-1953 or at Dennis.Rankin@usda.gov.

## Transmission Line Coordination - Engineering and Environmental Approval

For Generation and Transmission Borrowers, the Power Delivery and Transmission Assessment Branch (PDTAB) of the Power Supply Division is the first point of contact for the submittal of environmental and engineering documentation for transmission projects. This established policy allows PDTAB to manage and coordinate all aspects of a borrower's requests (engineering, financial, legal and environmental), make informed decisions and respond to a variety of requests. As the first point of contact, PDTAB can effectively coordinate its project review and other associated project activities in parallel with the Engineering and Environmental Staff's (EES) environmental review.

Copies of the environmental documents can be sent to both the PDTAB and EES simultaneously. However, the PDTAB logs the receipt of the documents and provides the documents to EES. The following problems may result when documents are sent directly to EES without notifying and/or coordinating with PDTAB:

- The PDTAB is required to look at the description and alternatives provided for the project to make sure it agrees with the RUS approved Construction Work Plan (CWP) or CWP Amendment. If the PDTAB does not receive the environmental document until after EES submits their findings then a parallel review can not be performed. Additional time will be necessary by PDTAB to complete the review of the borrower's request thus delaying a response/approval to the borrower.

- In certain instances, PDTAB has been unable to send the environmental approval letter or publish a Finding of No significant Impact in support of a borrower's request because the project was not included in an approved Construction Work Plan or CWP Amendment. In these instances, significant delays have resulted for the borrower until the necessary engineering documentation was provided. A satisfactory engineering review must be completed prior to or at the time the project environmental review request. Borrowers need to follow the CWP approval requirements in 7 CFR 1710.

- The borrower must coordinate with both the PDTAB and the Power Resources and Planning Branch on each generation project whether or not new transmission facilities will be constructed for the project. The PDTAB must perform a transmission assessment for any new generation plant or major capacity upgrade at an existing plant. A review by the PDTAB of the load flow, stability and impact studies will be required whether or not new transmission facilities are constructed. The environmental documentation should be in agreement with its findings. There have been several cases where a borrower and EES did not keep PDTAB informed about an ongoing environmental review process for a generating plant. No transmission engineering review was performed. In these instances, the transmission portion of the environmental documentation was lacking the full project details that were later part of a CWP provided in support of a loan. This could have been an issue if there had been organized action against the project.

In several instances RUS did not provide financing assistance for projects because the Borrower did not receive environmental approval prior to the start of construction. These situations included:

- The environmental report was completed, but not submitted to RUS for review. Construction was started without RUS environmental approval.

- The project was included in an RUS approved loan. A generic Environmental Report (ER) was completed. Final environmental approval was contingent on the review and approval of a site-specific ER for the project. Construction was started and the site-specific ER report was never completed.

- The project was not included in an RUS approved loan and the environmental review was not done. The project was constructed and the borrower decided to request reimbursement from a loan.

Borrowers must receive written environmental approval from RUS prior to the start of project construction. Failure to receive RUS environmental approval will jeopardize the eligibility of the project for loan funds or future reimbursement.

If you would like more information or have any questions, please call Dennis Rankin, Environmental Protection Specialist, Engineering and Environmental Staff at 202-720-1953 or at Dennis.Rankin@usda.gov, or Steven M. Slovikosky, Chief, Power Delivery and Transmission Assessment Branch at 202-720-1396 or at Steven.Slovikosky@usda.gov.

## Avian Protection Plans

Several Federal laws, including the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act and the Endangered Species Act, protect raptors and other migratory birds. In recent years, the U.S. Fish and Wildlife Service (USFWS) has been promoting the development of Memorandums of Understanding (MOU) that will partner the USFWS and electric utilities in an effort to eliminate/minimize avian mortality. The MOU is a pro-active approach to protect raptors and other migratory birds and eliminate /minimize unlawful deaths. It establishes a written policy for bird protection and procedures to follow by utility personnel. One of the components and an integral part of an MOU are the establishment of an Avian Protection Plan. The Avian Protection Plan (APP) is designed to protect and minimize risks resulting from interactions with a utility's facilities.

The USFWS is currently considering allowing electric utilities to develop an APP in lieu of the implementation of MOU's. It appears that the USFWS will only require the establishment of an MOU if a utility is not cooperating with the USFWS or the USFWS is forced to take legal action against a utility.

The USFWS is working with the Avian Power Line Interaction Committee to develop a template for an APP. Each utility would develop its own APP depending on its particular needs or

situations. For example, some utilities may have an APP that consists of a plan of action if avian electrocution/collision problems develop.

Components of an APP may include the following elements:

- Representative Birds/Habitats (Service Territory)
  - Birds At Risk/Habitats
  - Bird Concentration Areas
  - Potential Collision Areas
  - Other Problem Areas/High Risk Areas
- Summary of Laws and Regulations
  - Endangered Species Act
  - Eagle Protection Act
  - Migratory Bird Treaty Act
  - Other Applicable State Laws/Requirements
- Procedures
  - Permit Compliance
  - Nest Management
  - Reporting System (Form)
  - Reporting Procedures (Dead and Live Birds)
- Risk Assessment Methodology
- Construction Design Standards/Mitigation Plan
  - Current Structure Configurations
  - Potential Problem Structures
  - Potential Retrofit/Mortality Reduction Measures
  - Raptor Friendly Designs
- Training
  - Training Program For Utility Personnel
  - Development of A Public Awareness Program
  - References
- Corporate Policy

If you would like more information or have any questions, please call Dennis Rankin, Environmental Protection Specialist, Engineering and Environmental Staff at 202-720-1953 or at Dennis.Rankin@usda.gov.

# NRECA T&D ENGINEERING COMMITTEE

## Transmission and Distribution Engineering Committee

In 1991, the National Rural Electric Cooperative Association (NRECA) Board of Directors established the Transmission and Distribution Engineering Committee (T&DEC) to assist RUS in the development, analysis, and updating of RUS standards, guidelines and specifications. The

T&DEC also was tasked with watching the engineering and operational standards of national standards organizations to further help electric co-ops keep abreast of code changes and new designs involving the T&D engineering and supply chain management fields.

The T&DEC created seven subcommittees as follows: Materials, Overhead Distribution Lines, Substations, System Planning, Power Quality, Transmission Lines, and Underground Distribution. Membership on the Executive Committee and the various subcommittees consists of more than 80 volunteer engineers, operational and materials managers that are part of the engineering, operational, and materials professionals of electric cooperative staffs, NRECA and engineering consultants that work with electric co-ops. The Executive Committee consists of the chair of the T&DEC, chairs of the seven subcommittees, two NRECA Staff members, and the Director of RUS' Electric Staff Division.

2003 Activity: Strategic Planning – In April 2003, the T&DEC completed an important phase of a quest to have an on-going Strategic Plan. In September of 2002, the T&DEC began the exhaustive process of preparing a strategic plan for the committee and the subcommittees. The T&DEC formed a Strategic Planning Team that consisted of the committee chair, the subcommittee chairs, the RUS liaisons to each subcommittee, the two NRECA T&DEC principals, and NRECA's Executive Director of Research and Technical Services. As part of this process the committee tasked itself with crafting a Strategic Plan that would, by design, enable participants to: provide objective, outside analysis to determine the most appropriate use of all resources available; apply a proven approach to Strategic Initiative identification and Action Planning; and identify opportunities for quick wins by which the T&DEC can build momentum, and subsequently inspire the committee in formalizing direction, governance structure, and operating policies. In April, 2003, the Strategic Planning Committee met in Arlington, Virginia, and developed a strategic plan of action for the future and a list of the top priority projects that fell out of the systematic prioritization method used. The top 20 projects that were developed are listed below:

1. Interruption Reporting Bulletin
2. IEEE 1366 - Reliability Indices
3. Operations Manual
4. EGO Community Liaisons
5. URDU Research and Education
6. FERN Small Generator Interconnection
7. Joint Use Bulletin, RUS 1726A-125
8. Design Manual for High Voltage Trans
9. Transmission Specs and Drawings
10. Voltage Bulletin, RUS 169-4
11. Sectionalizing Bulletin, RUS 61-2
12. U-1 Specification Review
13. Application Guide for DG Interconnect
14. Long Range Planning Guide, RUS
15. IEEE ICQ Membership
16. IEEE 1547 Working Group Member
17. NITRIC Advisors
18. SC Community Liaison
19. IEEE Standards Activities
20. Cable Specification Trends

The following articles discuss the activities of the subcommittees. If you would like more information or have any general questions about the T&DEC, please contact George Bagnall, Director, Electric Staff Division, at 720-1900 or at George.Bagnall@usda.gov.

## Materials Subcommittee

The mission of the subcommittee is to assist the Rural Utilities Service (RUS) in keeping the RUS List of Materials useful to RUS borrowers and manufacturers; to inform NRECA member cooperatives on matters pertaining to RUS accepted materials; to support the Supply Chain Management Advisory Board initiatives and the Institute of Supply Management-Cooperative Utilities Educational mission.

Projects include studying the feasibility of different formats for the List of Materials, such as a searchable database; educating borrowers and manufacturers about the acceptance process; and serving as a clearinghouse for NRECA members to forward information on materials to RUS. The Subcommittee also continues to work with RUS in developing new categories and sub-categories for the List of Materials.

If you would like more information or have any questions, please contact Harvey Bowles, Chair of Technical Standards Committee "A" at 202-720-0980 or at Harvey.Bowles@usda.gov.

## Overhead Lines Subcommittee

The subcommittee is presently working on the following projects:

Operations Manual. This new manual (to be published by NRECA) will be a practical day-to-day "how to" manual for operations managers at electric cooperatives. The first draft of the manual is nearly complete.

RUS Bulletin 160-2, "Mechanical Design Manual for Overhead Distribution Lines" (1982) has been replaced with the following five new technical guide bulletins:

- Bulletin 1724E-150, "Unguyed Distribution Poles–Strength Requirements," was issued by RUS in July, 2003.
- Bulletin 1724E-151, "Mechanical Loading on Distribution Crossarms," was issued by RUS in November, 2002.
- Bulletin 1724E-152, "The Mechanics of Overhead Distribution Line Conductors," was issued by RUS in July, 2003.
- Bulletin 1724E-153, "Electric Distribution Guys and Anchors," was issued by RUS in April, 2001.
- Bulletin 1724E-154, "Distribution Conductor Clearances and Span Limitations," was issued by RUS in July, 2003.

RUS Bulletin 1726A-125, "Joint Use Agreement with CATV Companies." NRECA has hired a consulting firm to write a universal sample agreement for joint use with telecommunications companies. The document will be based on the most recent safety codes, federal regulations and legal rulings. The sample agreement will include such items as costs recoveries, inspection, insurance, indemnification and perhaps rate calculations and penalties. The subcommittee will review the document and make comments before it is finalized. A completion date for this project has not yet been determined.

The subcommittee is investigating: (1) the effects of magnesium chloride (MgCl – a road salt) on electric lines and line trucks (a survey has been completed); and, (2) the possible use of trunnion clamps for RUS standard distribution line construction.

If you would like more information or have any questions, please contact James Bohlk, Electrical Engineer, Distribution Branch, at 720-1967 or at Jim.Bohlk@usda.gov.

## Substation Subcommittee

The subcommittee met during the IEEE Rural Electric Conference on May 6, 2003, in Raleigh, NC, for Group discussion on the revision of RUS Bulletin 1724E-302, "Design Guide for Oil Spill Prevention and Control." EPA has recently issued new rules in regards to "Oil Spill and Prevention and Response" (40 CFR Part 112). The existing RUS Bulletin was due for renewal in 1996. The subcommittee will incorporate the new rules into a revision of the bulletin.

The work on the first draft was completed on April 1, 2003. Work on the Second Draft commenced at a committee meeting on May 6, 2003. The first five chapters were reviewed and edited with the coordinated help of the members present. Coordinated work on the remaining chapters was deferred to be done (if possible) via internet, or the next committee meeting in November 2003.

The subcommittee also had a discussion of the possible updates of the Rural Substation Design Manual (RUS Bulletin 1724E-300), including:

- In-Line Station Bus Design Alternatives,
- Substation Conductor Ampacity,
- Typical Design of Substation Steel and Foundations,
- Enclosed Substation Issues,
- Fire Safety Clearances, and,
- Substation Security Measures.

If you would like more information or have any questions about this article, please call Mike Eskandary, Electrical Engineer, Transmission Branch, at 202-720-9098 or at Mike.Eskandary@usda.gov.

## System Planning Subcommittee

The System Planning Subcommittee's activities include:

- IEEE 1547 "Standard for Interconnection Distributed Resources with Electric Power Systems" (Working Group)

  This working group (and three related working groups) is focused on developing the IEEE Distributed Generation (DG) Interconnection Standard and accompanying IEEE guides. Due to the fact that this important standard is being used as a reference for other federal and state DG Interconnection Regulations, the subcommittee continues to invest the time of the NRECA Principal in contributing to this Working Group.

- Application Guide for DG Interconnection

  The subcommittee has developed the NRECA application guide for IEEE Standard 1547. As part of this effort, the application guide will be revised to match the approved IEEE Standard.

- Distribution Transformer Efficiency Standard

  DOE is developing an ANOPR on distribution transformer efficiency standards. Subcommittee is reviewing and will comment on the ANOPR and the life cycle cost analysis used to support a proposed standard.

- Aging Analysis

  As portions of most rural distribution systems are approaching fifty years old, the maximum life expectancy for most of the equipment (poles, wire, transformers, etc.) is quickly being reached. Given the varying degrees of growth for rural distribution systems throughout the country, wholesale replacement of aging equipment is a practical impossibility. In response to this growing issue, the subcommittee is undertaking an effort to define a project and begin implementation.

- Long Range Planning Guide, RUS Bulletin 1724D-101A (revision)

  Due to the recent expiration of this RUS bulletin, the subcommittee with RUS representation is determining what, if any changes need to be made. It is anticipated that a revised or reissued guide bulletin will result from this effort.

- Sectionalizing Bulletin, RUS Bulletin 61-2 (revision)

  This bulletin was rescinded in 1992. Sectionalizing studies play an important role in the reliability of cooperative distribution systems. Also, with increasing penetration of Distributed Generation on distribution systems, new methodologies must be considered. A new RUS Bulletin will be prepared utilizing existing industry resources and that considers future industry trends.

- Distribution System Model Validation

  Due to increased concerns within the industry with regards to system model accuracy in planning studies, the subcommittee will evaluate what simplistic measurements can be taken and what devices potentially installed to verify results predicted by system planning models.

- Cooperative Research Network (CRN) Planning Guide

  The CRN Distribution Operations Task Force has requested that the subcommittee review and comment on the CRN Planning Guide. The CRN Guide will be an application guide to the RUS Construction Work Plan and the RUS Long Range Planning Guide Bulletins. This CRN guide will be made available to RUS for incorporation in RUS Bulletin revisions.

- Economic Design of Secondary

  A CRN project, never completed, focused on developing software for the economic design of overhead and underground secondary services. The software code has been made available to the subcommittee. The subcommittee will test algorithms and calculations used to ensure credibility, and make available the end product software tool to NRECA's membership as a whole.

- Strategic Planning Risk Management

  One of the members of the subcommittee has developed a strategic planning risk management package. In order to be utilized by a greater number of cooperatives, software needs to be converted from lotus to Microsoft Excel. The subcommittee is developing a plan to promote and demonstrate the concept to engineers, accountants, and managers at distribution cooperatives.

- FERC Small Generator Interconnection

  FERC has issued an ANOPR and recently issued a NOPR for small generator interconnections (under 20 MW) that potentially will include distribution co-ops. This could have a bigger impact than IEEE 1547 because FERC can mandate rules, while the IEEE standard is only a recommendation. NRECA Energy Policy is the lead, and they have requested T&D Engineering Committee and representation at the meetings.

If you would like more information or have any questions, please contact Chris Tuttle, Economist, Energy Forecasting Distribution Branch, at 202-205-3655 or at Chris.Tuttle@usda.gov.

## Power Quality Subcommittee

The subcommittee is presently working on the following projects:

- RUS Bulletin 169-4, "Voltage Levels on Rural Distribution Systems"

- RUS Bulletin 161-1, "Interruption Reporting and Service Continuity Standards for Electric Distribution Systems"

The sub-committee is also developing a Power Quality Checklist to assist utilities while investigating complaints.

If you would like more information or have any questions, please contact John Pavek, Chief, Distribution Branch, at 202-720-5082 or at John.Pavek@usda.gov, or Timothy Roscoe, Electrical Engineer, Distribution Branch, at 202-720-1972 or at Timothy.Roscoe@usda.gov.

## Transmission Lines Subcommittee

The Transmission Lines Subcommittee provides engineering support and technical expertise for the maintenance of existing and the creation of new RUS and NRECA standards, bulletins or guidelines to design, construct, operate, and maintain transmission lines.

The Transmission Lines Subcommittee has recently completed the "Procurement and Application Guide for Non-Ceramic Composite Insulators, Voltage Class 34.5 kV and Above." The committee is currently working on revision of the "Design Manual for High Voltage Transmission Lines." Construction specifications for steel and concrete poles have also been drafted. The project to develop standard drawings for steel and concrete pole construction and revision of the existing specification and drawings for wood construction has begun. It is anticipated that the concrete and steel construction specifications and drawings will eventually become separate bulletins.

If you would like more information or have any questions, please contact Donald Heald, Structural Engineer, Transmission Branch, at 202-720-9102 or at Don.Heald@usda.gov.

## Underground Distribution Subcommittee

The NRECA Underground Subcommittee has started assisting Bill Dorsett of Booth & Associates, Inc., in revising the NRECA Underground Distribution System Design and Installation Guide. The Subcommittee suggests splitting this comprehensive document into separate design and installation guides. References and terminologies will be updated to current acceptable standard.

This is a CRN funded project. The targeted completion date is March 19, 2004.

If you would like more information or have any questions, please contact Trung Hiu, Electrical Engineer, Distribution Branch, at 202-720-1877 or at Trung.Hiu@usda.gov.

# ADMINISTRATIVE and OTHER

## Use of Consultants Funded by Borrowers, 7 CFR 1789

On September 16, 1996, RUS published in the Code of Federal Regulations (CFR), 7 CFR 1789, "Use of Consultants Funded by Borrowers." The regulation introduced a means whereby RUS borrowers (Electric and Telecommunications Programs) could request that RUS use consultants funded by the borrowers to facilitate timely action on funding applications and other RUS required approvals. Originally RUS established standing contracts for legal services and created a pool consisting of five law firms. In 2001, RUS expanded the standing contracts to also include engineering, financial and environmental services; and firms were selected for each of these pools as well.

This year RUS re-established the standing contracts and now has eight legal services firms under contract, four engineering, four financial, and six environmental firms.

The decision to utilize any of the consultants under contract falls to the borrower first and it depends on the specific needs of the borrower and the RUS action the borrower needs to have completed. The action has to be related to the borrower's loan and be a required RUS action. From past experiences, usually, a borrower needs to obtain RUS approve for a lien accommodation, an environmental assessment, sale of facilities, etc., and the RUS approval is needed fast to be able to take advantage of a timeliness incentive attached to the deal. In most cases, to accommodate the action, there is a need for specialized expertise in the matters involved.

If interested, a borrower sends a letter requesting that it would like RUS to use an outside consultant that the borrower is willing to pay for to complete a required RUS action. The letter should also provide details of the action required and the need for expediting the action with use of a consultant. After the appropriate RUS assistant administrator concurs with the request and its purpose and need, a Statement of Work (or Task Order) is written by RUS to specify the work required. The Statement of Work or Task Order is then presented to the firms within a specific pool of consultants for bids. RUS then selects the most qualified consultant according to evaluation criteria developed by RUS.

An integral requirement of this consultant processing tool is that the borrower agrees to establish, fund, and maintain an escrow account from which monies are paid to the consultant for services rendered.

A number of borrowers have successfully used this tool since its 1996 inception.

If you would like more information or have any questions, please contact Sharon Ashurst, Public Utility Specialist, Energy Forecasting Branch, at 202-720-1925 or at Sharon.Ashurst@usda.gov.

## 2004 Rural Electric Power Conference

Each year the Rural Electric Power Conference (REPC) Committee of the Institute of Electrical and Electronics Engineers' (IEEE) Industry Applications Society sponsors a conference which is ideally suited to rural electric utilities. The conference is aptly named after the committee responsible for producing the conference but the name, Rural Electric Power Conference, is also well suited for the conference's intended audience. The purpose of every meeting of the conference is to provide utility engineers and operations personnel, consultants, and utility-related business people with information on the design, operations and analysis of electric distribution systems with special emphasis for utilities with rural distribution systems.

For an idea of the type of the information and sessions that can be expected during these conferences, please visit the Internet Address below to see this past year's program:

**http://www.ewh.ieee.org/soc/ias/repc/2003REPC.htm**

The 2004 Rural Electric Power Conference, the 48th Annual meeting of the conference, will be conducted on May 23, 24, and 25, 2004, at the Doubletree Hotel, 5401 N. Scottsdale Rd, Scottsdale, AZ 85250-7090. RUS recommends that borrowers keep an eye out for next year's program and consider attending it.

If you would like more information or have any questions, please contact George Bagnall, Director, Electric Staff Division, at 202-720-1900 or at George.Bagnall@usda.gov, or Dan Brewer, 2004 IEEE REPC Chairman, at 859-885-4191 or at danb@bgenergy.com.

## Rural Broadband Access Loan and Loan Guarantee Program

Electric borrowers may be in a position to help bring broadband telecommunications services to their service area where such services are either not available or they are unreliable. The following provides details on a RUS Telecommunications Program activity that perhaps electric borrowers could use for the advantages of people in their service areas.

On May 13, 2002, the "Farm Security and Rural Investment Act of 2002" (Farm Bill) was signed into law by President Bush. Section 601 of the Farm Bill amended the Rural Electrification Act of 1936, and establishes the Rural Broadband Access Loan and Loan Guarantee Programs.

The Rural Broadband Access Loan and Loan Guarantee Program is designed to provide loans for funding the costs of construction, improvement and acquisition of facilities and equipment to provide broadband services to eligible rural communities. The goal is to ensure that rural consumers enjoy the same quality and range of telecommunications services that are available in urban and suburban communities.

Applicant Eligibility (7 CFR 1738.16)

RUS makes broadband loans and loan guarantees to legally organized entities providing, or proposing to provide, broadband services in eligible rural communities.

Eligible entities include: cooperative, nonprofit, limited dividend or mutual associations, limited liability companies, Indian tribes and tribal organizations as defined in 25 U.S.C. 450(b) and (c) and commercial organizations. Individuals or partnerships of individuals are not eligible entities.

Eligible Loan Purposes (7 CFR 1738.10 and 1738.19)

RUS makes broadband loans and loan guarantees to:

- Finance the construction, improvement, and acquisition of facilities and equipment to provide broadband service in eligible rural communities;

- Finance broadband facilities leased under the terms of a capital lease, as defined in generally accepted accounting principals; financing will be limited to 2 years of lease costs;

- Finance the acquisition by an eligible entity of another system, lines or facilities if the acquisition is necessary and incidental to furnishing or improving rural broadband service; and

- Refinance an outstanding obligation on another telecommunications loan made under the RE ACT. The refinancing cannot exceed 40 percent of the loan amount.

Points of Contact: BROADBAND TEAM

A prospective applicant should contact one of the following Broadband Team members prior to submitting an application:

Kenneth Kuchno at 202-720-8427 or at Kenneth.Kuchno@usda.gov

Deborah Jackson at 202-720-8427 or at Deborah.Jackson@usda.gov

Pamela Bennett at 202-720-8805 or at Pamela.Bennett@usda.gov

For engineering inquiries:

Kenneth Kuchno at 202-720-8427 or at Kenneth.Kuchno@usda.gov

Norberto Esteves at 202-720-0699at Norberto.Esteves@usda.gov

## Television in Transition: When Will Rural America Be Able to Tune In?

Television is undergoing a quality transformation worldwide, and the United States, where the technology was invented and nurtured in its early years, is struggling to maintain its historic

leadership role. Television broadcasters, multi-channel content providers (cable television and direct-broadcast satellite services), program content owners, television set manufacturers, and even consumers, have diverging interests that will be affected by the course of this quality-based transformation.

Regulatory Requirements for the Digital Transition

After a lengthy implementation process, the Federal Communications Commission (FCC) on April 3, 1997, issued its order implementing Digital Television (DTV) service.[1] The rollout of DTV began with the requirement for affiliates of the four top networks (ABC, CBS, Fox, and NBC) to begin broadcasting digital programming in the top 10 television markets by May 1, 1999, and for affiliates of those networks to start broadcasting digital signals in markets 11 through 30 by November 1, 1999. Commercial broadcasters in all markets were to begin broadcasting digital signals by May 1, 2002, and non-commercial broadcasters were given until May 1, 2003 to be broadcasting digitally.

To enable an orderly transition from analog broadcasting[2] to the new and incompatible digital broadcasting scheme, the FCC provided each broadcaster with a second 6 MHz channel, in the Ultra-High-Frequency (UHF) channel range. Thus, each broadcaster would, from the onset of digital broadcasting, be broadcasting both a digital signal and an analog signal, until such time that the FCC mandated discontinuation of analog television broadcasting. The statute states that the analog broadcast spectrum licenses expire by December 31, 2006, and that the FCC must recover unneeded spectrum from broadcasters.

On January 27, 2003, the FCC initiated the second review of the DTV transition.[3] The Notice of Proposed Rulemaking states the FCC's objective to continue the rapid deployment of the service, and seeks comment on how to interpret the criteria for approving extensions of the December 2006 analog television broadcasting shutoff. As the 2006 deadline for FCC recovery of the broadcasters' analog channel draws nearer, the Commission needs to create a standard for issuing extensions to broadcasters who will not meet it. Broadcasters will have the option of keeping the new UHF channel they are currently using to deliver DTV, or keeping their originally assigned channel, which may be VHF or UHF, for their permanent DTV broadcast channel, and the January 27 Notice initiates this decision process for broadcasters.

It is interesting to note that while the FCC is mandating the digital transition, it has not mandated the delivery of High Definition Television (HDTV).

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1. *See* Report No. MM 97-8, The Fifth Report and Order, at http://www.fcc.gov/Bureaus/Mass_Media/Orders/1997/fcc97116.html.

2. Analog television operates under a set of protocols that were set by the National Television Standards Committee in 1953.

3. *See* Notice of Proposed Rulemaking FC 03-8, http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-8A1.pdf.

Why Convert Television To Digital?

The reason for converting from analog to digital television is to provide HDTV service in a spectrum-efficient manner. The Japanese pioneered HDTV with the MUSE (multiple sub-Nyquist sampling encoding) system in 1990. Achieving high resolution and widescreen imaging required two standard 6 MHz television channels using a digitally processed picture broadcast as an analog signal. Without the digital processing, the Japanese system had a native bandwidth requirement of 29 MHz. In the United States, an improved television picture was a national objective, but the FCC did not consider it prudent to multiply the spectrum needs of every broadcaster at a time when wireless telecommunications service was becoming extremely popular, creating its own additional demand for electromagnetic spectrum. Because of advances in video compression, the DTV system adopted in 1997 made it possible to provide HDTV over the same 6 MHz channel that broadcasters use now to deliver analog television.

How Can Digital Television Be Delivered

Digital television operates over a 6 MHz channel, so where the transmission medium is uncompressed, a digital signal can be delivered over a path that delivered an analog television signal. Broadcasters are delivering HD signals over UHF channels and viewers use standard UHF antennas to receive them.

Current (non-digital) cable television systems generally can't carry DTV signals because their channel bandwidth is not a full 6 MHz. Digital cable systems can carry DTV and HDTV.

The Direct Broadcast Satellite systems carry all signals digitally, but embed compression in their satellite transponder usage. They can carry DTV and HDTV signals, and receivers have become available recently that offer digital video outputs.

Why Are Some Broadcasters Not Meeting the Digital Broadcast Deadline?

It costs a broadcaster about $1.2 million to add digital transmission capability (a second broadcast channel which often duplicates the broadcaster's NTSC programming). This does not include program origination capability. Adding this second broadcast channel also requires a second antenna, which can require an additional tower and a new communications link to that tower.

Unfortunately, broadcasting DTV, and perhaps HDTV, does not present a new revenue stream. Broadcasters are required by regulation to broadcast DTV, but doing so during the transition won't significantly increase their market share, and won't improve their ratings, on which advertising revenues are based.

Rural commercial and non-commercial broadcasters with small revenue streams will have difficulty finding funding for the digital transition. It appears that the FCC will grant extensions to small stations, but this does not solve the problems for those stations. After the conversion, analog television sets will become unavailable, and from the recent demise of the phonograph record and the audio cassette, and the ongoing decline of the videocassette, we can see how quickly a well-established format can vanish.

Who is Broadcasting DTV?

As of June 10, 2003, the National Association of Broadcasters reports that 901 local stations are broadcasting DTV in 189 (of 210) Designated Market Areas (DMA's).[4] These 901 stations serve over 97% of U.S. television households. More than three times as many television households can receive five or more DTV signals this year than could last year. Since under the FCC rules all commercial broadcasters were to be broadcasting in digital by May 1, 2002, the most interesting part of these statistics is that over 40% of the nation's 1600 television broadcasters still are not broadcasting a digital signal.

Non-commercial broadcasters, who are mostly public television stations, had until May 1, 2003, to begin broadcasting digital signals. Although some public television stations were among the first to begin broadcasting HDTV signals, 168 of the 397 public television stations have begun transmitting digital signals, according to the Association of Public Television Stations, as of June 10, 2003.[5]

According to the Consumer Electronics Association, sales of DTV receivers to retailers reached 2.1 million by December 31, 2002. By that date, over 4 million DTV products (televisions and receivers) had been sold to dealers. With everyone looking for signs that DTV is taking off, two important trends have emerged. First, the public is beginning to accept widescreen television sets. In 2002, there was a 52.4% increase in sales of widescreen DTV's.[6] Widescreen presentation is an important and unique advance of HDTV. The second trend is that, according to the Consumer Electronics Associaion, 62% of television households now "plan to buy" a DTV. The CEA also states that the adoption rate of DTV is higher than were those for color TV, the personal computer, and the video cassette recorder.

What Is It Like to Own HDTV?

The picture quality of an over-the-air HDTV signal is astounding. The level of detail presented on the screen shows facial details previously unimagined. Color rendition is so lifelike the viewer can forget it is television. Color artifacts once common on NTSC television are gone. Horizontal scan lines are not visible. Object edges are clear and clean. Watching the Super Bowl you could see fans moving around at the far side of the stadium. The picture has a three dimension quality because it is so lifelike. Unlike NTSC television, HDTV pictures look great on sets with large screens. The HDTV broadcast picture is noticeably better than that from a DVD connected with component video cables, which is the best presentation ever available from NTSC television. Images once thought to be excellent (such as the laserdisc and Super VHS) look soft and blurry on a big screen compared to the crisp HDTV and even SDTV signals. This is an improvement in technology that every viewer can recognize.

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4. *See* National Association of Broadcasters website, *Newsroom*, http://www.nab.org/Newsroom/issues/digitaltv/DTVStations.asp
5. *See* Association of Public Television Stations website, *Researvh and Information*, http://www.apts.org/html/research_facts/research_facts.html
6. Most digital television monitors and integrated sets can display a High Definition picture, but not all are widescreen. Only in 2001 and 2002 have widescreen sales become promising. In 2001, widescreen sales increased 44.4% and in 2002 they grew by 52.4%.

Unfortunately, most viewers cannot watch an off-the-air signal because their HDTV sets are not equipped with tuners. The FCC has mandated that equipment manufacturers build most future sets with tuners. Consumers want tuners and sets with them. There are two reasons, both of which are melting away with time, cost and need. Initially, digital tuners cost over $1,000 to integrate into the already-expensive television sets. The price of standalone tuners has come down to the $300-$400 range, and is continuing to fall. The need for DTV tuners is here today. Until recently there were few stations broadcasting HDTV programming, but now, 72% of TV households have access to five or more broadcast stations offering DTV, and most of those stations offer some HDTV. These developments, coupled with the FCC requirements for tuner rollout, will bring affordable, integrated DTV sets to the market by the beginning of the next product year, in the fall of 2003.

Digital Television is the Future

While there may be debate over when DTV and HDTV will arrive, there is no doubt that it will arrive. High definition programming has become common, with most public interest and major sports events now routinely covered in HDTV. For example, viewers following the three jewels in the Triple Crown were recently treated to magnificent vistas and clearly visible horseracing drama via HDTV.

The digital conversion remains a challenge to rural broadcasters. These broadcasters' markets have been eroded by the success of DBS in rural areas, and now they must make major investments in equipment just to stay on the air. Rural public broadcasters in particular are having difficulty finding funding for the transition.

The signal delivery systems that serve rural areas may be the toughest barrier to rural HDTV delivery. Similar to the "last mile" connection that prevents many rural households from receiving broadband Internet access, rural CATV systems and DBS hardware at the home will have to be replaced to enable delivery of HDTV.

The end will truly justify the means. Television has never looked so good, and video programming has never had the potential for such efficient handling, as it will in the digital domain.

If you would like more information or have any questions, please contact Ed Cameron, Director, Advanced Services Division of RUS' Telecommunications Program, at 202-690-4493 or at Ed.Cameron@usda.gov.

## Saving Lives with an All-Hazard Warning Network

The Rural Utilities Service's Weather Radio Transmitter Grant Program awards grants to finance the installation of new Weather Radio transmitters to extend the coverage of the National Oceanic and Atmospheric Administration's Weather Radio system (NOAA Weather Radio) in rural America. Five million dollars were appropriated to facilitate the expansion of NOAA Weather Radio system coverage into rural areas that are not covered or are poorly covered at this time. This grant program provides grant funds for use in rural areas and communities of 50,000

or less inhabitants. Grant applications are being processed on a first-come, first-served basis until the appropriation is used in its entirety. So far, over 75 grants have been made, including more than a dozen grants to rural electric cooperatives and public power districts.

NOAA Weather Radio broadcasts warnings and post-event information for all types of hazards - weather (such as tornadoes, hurricanes, and floods), natural (such as earthquakes, forest fires, and volcanic activity), technological (such as chemical releases, oil spills, and nuclear power plant emergencies), and local and national emergencies (such as AMBER Alerts and terrorist attacks). NOAA Weather Radio, as an all-hazards radio network, is integral to homeland security.

If you would like more information or have any questions concerning this program, please contact Craig Wulf, Program Advisor in RUS' Telecommunications Program, at 202-720-8427, or at Craig.Wulf@usda.gov, or Ed Cameron, Director, Advanced Services Division of RUS' Telecommunications Program at 202-690-4493, or at Ed.Cameron@usda.gov.

## RUS Buy American Provision

The Rural Electrification Act of 1936 includes a "Buy American" provision which imposes a condition on RUS borrowers to use RUS loans to procure and use materials and equipment that are domestically produced. As a result of changes introduced in the last several years by the North American Free Trade Agreement (NAFTA), an Agriculture Department reorganization, and the General Agreements on Tariff and Trade (GATT), the "Buy American" provision of the RE Act reads as follows:

> "In making loans pursuant to this title and pursuant to the Rural Electrification Act of 1936, the Secretary of Agriculture shall require that, to the extent practicable and the cost of which is not unreasonable, the borrower agree to use in connection with the expenditure of such funds only such unmanufactured articles, materials, and supplies, as have been mined or produced in the United States or in any eligible country, and only such manufactured articles materials, and supplies as have been manufactured in the United States or in any eligible country substantially all from articles, materials, or supplies mined, produced, or manufactured, as the case may be, in the United States or in any eligible country. For purposes of this section, an 'eligible country', is any country that applies with respect to the United States an agreement ensuring reciprocal access for United States products and services and United States suppliers to the markets of that country, as determined by the United States Trade Representative."

Except for the addition of "or any eligible country" and the definition of "eligible country," this provision is pretty much the same as it existed when established in 1936.

After the first 20 years of the program's beginning, to provide guidance to borrowers on the "Buy American" provision, RUS' predecessor, the Rural Electrification Administration (REA), issued a guidance bulletin that is still in use today…REA Bulletin 43-9 (Electrification), 344-3 (Telephone), "'Buy American' Requirement." Basically the bulletin advises borrowers

that when using Government loan funds, or their own general funds that they expected to receive reimbursement with loan funds, to procure unmanufactured materials (coal, sand, construction aggregates, etc.,) or manufactured products (poles, transformers, hardware, etc.,) that they have to procure domestically produced products. The bulletin provides two exceptions to the requirement and allows borrowers to use loan funds to procure non-domestic products:

1. Where the cost of the non-domestic product, including all import duties, entry costs and delivery charges to the borrower's materials receiving location are at least 6 percent less than the cost of a comparable domestic product delivered to the same receiving location; and

2. Where like or comparable domestic products are not available or are in such short supply that they will unduly delay the borrower's construction progress.

Exception 1 can be utilized by borrowers without need to obtain RUS approval with one caveat. Borrowers need to obtain RUS approval to utilize Exception 2.

The caveat to be aware of in utilizing Exception 1 relates to Code of Federal Regulations (CFR) section 7 CFR 1728.70, "Procurement of Materials." This RUS CFR section requires borrowers to use only materials that are included in RUS Information Publication IP 201-2, "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers," or that have current RUS Technical Acceptance. (RUS Technical Acceptance is considered only for a non-domestically produced product whose utility falls within a category of product included in the List of Materials and which complies with all the technical requisites established for the category.) Thus, if a non-domestic product being consider for use does fall into a List of Materials category and there are comparable domestic products included in the category, then, to procure the non-domestic product, regardless of whether the non-domestic product meets the 6 percent price differential of Exception 1, borrowers have to be certain that the non-domestic product has RUS Technical Acceptance first and then, if it has RUS Technical Acceptance and meets the price differential, procurement can be made without the need of obtaining RUS approval. RUS approval is required to use a non-domestic product that does not have a current RUS Technical Acceptance. If the RUS letter advising of a product's Technical Acceptance, including the acceptance time period, is not available, borrowers can contact the Chair of Technical Standards Committee "A" to verify a products Technical Acceptance status. The Chair's address and telephone number can be found in Appendix A of this Summary of Items of Engineering Interest.

To determine whether a product is domestic, the product has to pass a two part test:

1. Final manufacture of the product is completed in the United States (or any its territories, etc.,) or any eligible country, and

2. The costs of all product components manufactured in the U.S. or any eligible country used in the final product have to account for more than 50 percent of the total cost of the product. The assessment requires separately summing the costs of components produced in the U.S. or any eligible country and a summing of costs of the components not produced in the U.S. or any eligible country. Sums must include the

costs of taxes and delivery to the assembly location for each component and the sums for the components not produced in the U.S. or any eligible country have to include import and other entry costs imposed. Labor costs for handling components at the final assembly location and for the assembly of the final product are not to be included.

If a product fails to meet Step 1 of the test, the product is considered non-domestic and there is no need to go to Step 2. If a product passes Step 1 of the test, Step 2 kicks in and the costs (including taxes, delivery costs of all domestic components have to be tallied as do the non-domestic component costs [again including import duties and all entry costs, taxes, delivery costs, etc., to get the product to the assembly point]). The product is considered a domestic product if the domestic component costs total to be more than 50 percent of the total cost of the final product. Note the costs of labor at the assembly point are not to be included.

NAFTA and GATT added the phrase "or any eligible country" to the RE Act and this phrase refers to the countries that the United States Trade Representative (USTR) identifies as countries that are party to an agreement with the U.S. which ensures reciprocal access for United States products and services and United States suppliers to the markets of that country and vise versa.

At the present time, for the Electric Program, the USTR has identified the following as eligible countries:

| | | | |
|---|---|---|---|
| Austria | Belgium | Canada | Denmark |
| Finland | France | Greece | Hong Kong China |
| Iceland | Ireland | Israel | Italy |
| Korea | Liechtenstei | Luxembourg | Mexico |
| Netherland | Norway | Singapore | Spain |
| Sweden | Switzerland | United Kingdom | |

RUS assures that only products meeting the "Buy American" provisions of manufacture are included in RUS Information Publication IP 201-2, "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers." So procuring products from those included in the List of Materials should be make borrowers' "Buy American" responsibilities simpler but borrower procurement people should keep an eye out on material deliveries to make certain that all products procured with RUS loan funds are in compliance with the domestic origin manufacture requirements of the "Buy American" provisions, even the RUS accepted products. If the label indicates that the product was manufactured in the U.S. or any of the eligible countries included in the list provided here there is a good chance that it complies and, with any other country listed, that it does not. If a product included in the List of Materials is found not to be manufactured in the U.S. or any of the eligible countries designated by the USTR, we would certainly appreciate hearing about the details.

If you would like more information or have any questions, please contact Harvey Bowles, Chair of Technical Standards Committee "A" at 202-720-0980 or at Harvey.Bowles@usda.gov.

## The RUS Website

The RUS website (http://www.usda.gov/rus) has been redesigned to make it easier to locate the information that you need. The website is not static, but rather it is dynamic, sometimes changing almost daily, to provide up-to-date information

To reach the Electric Program portion of the website, you may either start at the RUS home page, or go directly to http://www.usda.gov/rus/electric. You will now find a consistent format as you go from page to page, with a convenient side-bar menu for navigation. We have added a search box at the top of the navigation bar.

If you would like more information or have any questions, please contact Harvey Bowles, Chair of Technical Standards Committee "A" at 202-720-0980 or at Harvey.Bowles@usda.gov or send a message to RUS.Electric@usda.gov.

## RUS 2004 Electric Engineering Seminar and TechAdvantage 2004

RUS is planning to hold its 2004 Electric Engineering Seminar in New Orleans, LA, during the week of February 9, 2004, in conjunction with TechAdvantage 2004, sponsored by the National Rural Electric Cooperative Association (NRECA). All interested personnel are urged to keep that week open for these events.

The purpose of the RUS seminar is to bring together engineers and other staff from the rural electric community to discuss matters of mutual interest and concern in order to provide better electric service in rural areas. Topics may include RUS construction standards, material and equipment standards and procedures, renewable energy issues, environmental matters, new developments, and other issues related to RUS and the rural electric community.

NRECA's TechAdvantage will include engineering, operations, supply management, and information technology sessions, as well as the Expo, which gives attendees the opportunity to view numerous exhibits presenting state-of-the-art products and services that they can utilize in the daily operation of their cooperative. Visit the TechAdvantage website at:

**http://techadvantage.org/**

If you would like more information or have any questions, please contact Fred Gatchell, Deputy Director, Electric Staff Division, at 202-720-1398 or at Fred.Gatchell@usda.gov.

## RUS Technical Publications

RUS has issued a number of technical publications recently. These publications include:

Rules:

- **7 CFR 1710, Subpart H, "Demand Side Management and Renewable Energy Systems."** This final rule, dated November 21, 2002, eliminated Subpart H in its

entirety. The old subpart H detailed separate policies and requirements for loans for renewable energy systems and demand side management. Many of these requirements overlapped provisions found elsewhere in part 1710. Others did not seem well suited for the smaller scale projects of the type that are becoming increasingly common in the industry. RUS decided that it is more appropriate to consider such small scale projects in this rapidly developing segment of the energy industry by proceeding on a case-by-case basis.

For more information, please contact Georg Shultz of ESD at 202-720-1920 or at Georg.Shultz@usda.gov.

- **7 CFR 1726, Revision of Electric Program Standard Contract Forms.** This proposed rule, dated July 2, 2002, would update, consolidate, and streamline our standard forms of contracts. This would include the elimination of unneeded forms, making forms suitable for "subject to" or "not subject to" RUS approval, making construction contract forms suitable for "labor only" or "labor and material," standardizing tables and information pages and incorporate them as separate attachments, maximizing consistency among forms, and updating and clarifying contract provisions as necessary. These changes are being made to improve the usefulness of the standard forms of contract.

  For more information, please contact Fred Gatchell of ESD at 202-720-1398 or at Fred.Gatchell@usda.gov.

- **7 CFR 1794, Environmental Policies And Procedures.** This final rule, dated August 1, 2003, revises RUS' existing environmental regulations. For more information, see the related article included in this issue of the Items of Engineering Interest.

  For more information, please contact Larry Wolfe of the Engineering and Environmental Staff at 202-720-5093 or at Larry.Wolfe@usda.gov.

Guidance Documents:

This following four bulletins, together with **Bulletin 1724E-153, "Electric Distribution Line Guys & Anchors,"** dated April 25, 2001, replace REA Bulletin 160-2, "Mechanical Design Manual for Overhead Distribution Lines."

- **Bulletin 1724E-150, "Unguyed Distribution Poles – Strength Requirements,"** dated July 31, 2003. This presents equations, data, and other information needed to determine:
  - The loads applied to unguyed wood distribution poles,
  - A pole's strength requirements to sustain applied loads, and
  - Maximum horizontal spans based on pole strengths.

  Sample solved problems are included in this bulletin to help the reader understand and apply the presented equations. A table of calculated ground line moments caused by wind on wood poles and a table of calculated permitted moments at the ground line of commonly used wood poles are included at the end of this bulletin.

For more information, please contact Jim Bohlk of ESD at 202-720-1967 or at Jim.Bohlk@usda.gov.

- **Bulletin 1724E-151 "Mechanical Loading on Distribution Crossarms,"** dated November 21, 2002. This bulletin presents equations, data, and other information needed to determine the permitted mechanical loading on wood distribution crossarms. Sample solved problems and tables of permitted crossarm loading are presented to help the reader understand and apply the information in this bulletin.

  For more information, please contact Jim Bohlk of ESD at 202-720-1967 or at Jim.Bohlk@usda.gov.

- **Bulletin 1724E-152, "The Mechanics of Overhead Distribution Line Conductors,"** dated July 31, 2003. This bulletin will present and explain:

  * The equations needed to calculate ruling spans and conductor sags and tensions,

  * Guidelines for preparing or selecting sag-tension tables,

  * The characteristics, behavior, and installation of distribution line conductors, and,

  * Information regarding aeolian vibration.

  For more information, please contact Jim Bohlk of ESD at 202-720-1967 or at Jim.Bohlk@usda.gov.

- **Bulletin 1724E-154, "Distribution Conductor Clearances and Span Limitations,"** dated July 31, 2003. The conductor clearance requirements of Rule 235 of the National Electrical Safety Code (NESC) may limit overhead distribution span lengths. This bulletin presents information and the equations needed to determine the maximum span lengths that will meet NESC mid-span and supporting structure clearance requirements between conductors. Only bare electric supply conductors supported by the Rural Utilities Service (RUS) standard distribution primary, pole-top assemblies are analyzed in this bulletin. However, the equations presented in this bulletin can be applied to other types of conductors and support assemblies. Diagrams and example solved problems are included in this bulletin to clarify the presentation.

  For more information, please contact Jim Bohlk of ESD at 202-720-1967 or at Jim.Bohlk@usda.gov.

- **IP 202-1, "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers,"** published in July, 2003, and its quarterly supplements. This document provides a convenient listing of the materials and equipment that have been accepted by RUS.

  For more information, please contact Harvey Bowles of ESD at 202-720-0980 or at Harvey.Bowles@usda.gov.

If you need any of these publications, please contact RUS' Program Development and Regulatory Analysis staff at 202-720-8674. Many RUS publications are also available via the Internet at:

*For Rules:* **http:/www.usda.gov/rus/electric/regs/index.htm**

*For Bulletins:* **http://www.usda.gov/rus/electric/bulletins.htm**

Publications in Progress

**Timber Specifications:** RUS is in the process of revising the following three bulletins that cover pressure treating of poles and crossarms, and their respective quality control:

- **Bulletin 1728F-700, "RUS Specification for Wood Poles, Stubs and Anchor Logs,"**
- **Bulletin 1728H-701, "RUS Specification for Wood Crossarms (Solid and Laminated) Transmission Timbers and Pole Keys"** (7 CFR 1728.201), and
- **Bulletin 1728H-702, "RUS Specification for Quality Control and Inspection of Timber Products"** (7 CFR 1728.202).

Topics currently being considered for revision include:

* Elimination of the requirement for borrowers to notify RUS of their timber product purchases during the previous year,
* Reinstatement of the acceptance and listing of inspection agencies in the RUS List of Materials,
* Requirement for a heat sterilization during kiln drying or steam conditioning of poles,
* Requirement for inspection agencies to have their company designation branded or tagged on the pole face,
* Requirement for all independent inspectors and plant quality control personnel to be trained and certified by x-ray fluorescence instrument manufacturer,
* Requirement for treating plants and inspection agencies to maintain certain levels of liability insurance and errors and omission insurance, and
* Include butt treating of cedar poles as an acceptable method of treatment for poles.

RUS is soliciting input from electric borrowers and others as to necessary changes to these bulletins. Comments or suggestions should be sent to H. Robert Lash, Chief, Transmission Branch, RUS, Stop 1569, 1400 Independence Ave SW, Washington, DC 20250-1569, e-mail: Bob.Lash@usda.gov. All comments are welcome.

RUS is also working on the following publications:

- **Bulletin 1724D-114, "Voltage Regulator Application on Rural Distribution Systems."** This bulletin will examine the application of voltage regulators on rural distribution systems and serve as a general guide for voltage regulator applications to RUS borrowers and others.

  For more information, please contact John Pavek of ESD at 202-720-5082 or at John.Pavek@usda.gov.

- **Bulletin 1724E-220, "Procurement and Application Guide for Non-Ceramic Insulators, Voltage Class 34.5 kV and Above."** This guide is being proposed to simplify the procedure in selecting and procuring non-ceramic insulators. For more information, see the related article included in this issue of the Items of Engineering Interest.

  For more information, please contact Don Heald of ESD at 202-720-9102 or at Don.Heald@usda.gov, or Norris Nicholson of ESD at 202-720-1924 or at Norris.Nicholson@usda.gov.

- **Bulletin 1728F-804, "Specifications and Drawings for 12.47/7.2 kV Line Construction"** (incorporated by reference.) This will be an update of an existing Bulletin 50-3 with the same title. For more information, see the related article included in this issue of the Items of Engineering Interest.

  For more information, please contact Jim Bohlk of ESD at 202-720-1967 or at Jim.Bohlk@usda.gov.

- **Bulletin 1728F-U-1, "RUS Specifications for 15 kV, 25 kV, and 35 kV Primary Underground Power Cable"** (incorporated by reference.) The bulletin is being revised to keep abreast of current primary insulated cable technology. For more information, see the related article included in this issue of the Items of Engineering Interest.

  For more information, please contact Trung Hiu, Electrical Engineer, Distribution Branch, at 202-720-1877 or at Trung.Hiu@usda.gov.

If you would like more information or have any questions, please contact Fred Gatchell, Deputy Director, Electric Staff Division, at 202-720-1398 or at Fred.Gatchell@usda.gov.

## Homeland Security - RUS Emergency Operation Disaster Plan

The attacks of September 11 highlighted the fact that terrorists are capable of causing enormous damage to our country by attacking our critical infrastructure - energy sources (electrical, nuclear, gas and oil, dams); information and telecommunications networks; water, food, agriculture, and health and emergency services; transportation (air, road, rail, ports, waterways); banking and finance systems; postal and other assets and systems vital to our national security,

public health and safety, economy and way of life. The interdependency all these infrastructures upon each other and especially the electric sector are obvious.

Protecting America's critical infrastructure is the shared responsibility of federal, state, and local government, in active partnership with the private sector, which owns approximately 85 percent of our nation's critical infrastructure. The newly formed Department of Homeland Security, specifically the Directorate of Information Analysis and Infrastructure Protection (IAIP) will take the lead in coordinating the national effort to secure the nation's critical infrastructure in the coming years. This will give state, local, and private entities one primary contact instead of many for coordinating protection activities within the federal government, including vulnerability assessments, strategic planning efforts, and exercises. RUS and most importantly you the electric utility must be proactive in electric infrastructure security.

The Rural Utilities Service (RUS) is distinctly coupled with the Electric infrastructure of Rural America and the electric utilities serving Rural America. Seventy-five percent of the electric infrastructure of the Unite States resides in, and is maintained by, Rural America. To fortify the electric infrastructure in Rural America, RUS is proposing to institute a regulation requiring RUS Electric borrowers to have an Emergency Operation Disaster Plan in place prior to considering a loan application request or the release of any RUS grant, loan or loan guarantee.

This additional requirement will not be wholly new to borrowers as RUS has required similar "plans" in the past. RUS, previously known as the Rural Electrification Administration (REA) has promoted and recommended that each utility have a "Disaster Plan" or "Emergency Restoration Plan." In 1960, in Bulletin 60-7, "Service Reliability," REA included the requirement of a Disaster Plan. More recently, in January of 1998, RUS further identified the need for an Emergency Restoration Plan in Bulletin 1730-1, "Electric System Operation and Maintenance (O&M)," an updated version of REA Bulletin 161-5.

RUS borrowers and most all electric utilities have utilized these "Plans" in regard to natural disasters such as tornados, hurricanes, ice storms and major equipment failure. The September attacks by terrorists and the continuing threats upon our way of life in the United States has precipitated the necessity of a next generation plan to include business continuity, and other causes of system failure. RUS plans to incorporate aspects of the two previous plans along with new requirements into one Emergency Operation Disaster Plan (EODP) adding pertinent clauses to incorporate unnatural disasters to include terrorism both domestic and foreign. The criteria of each borrower having an EODP will be a new requirement for all RUS loans whether new or existing.

RUS is not planning on dictating a specific, unilateral, plan to all borrowers; as all electric utilities are not the same and one size does not fit all. RUS plans to issue a guidance bulletin which will contain general methodologies, practices and planning related to electric borrowers' procedures to support the security of their electric systems and to support homeland security in the protection of the electric infrastructure. The guide bulletin is expected to be published about the same time the final rule goes into effect.

If you would like more information or have any questions, please contact John B. Pavek, Chief, Distribution Branch, at 202-720-5082 or at John.Pavek@usda.gov.

## Changes to the Definition of Rural and the Increasing Use of GIS Tools

The Rural Electrification Act of 1936 (RE Act) provides the authority under which RUS makes loans and loan guarantees to furnish and improve electric service to rural consumers. Section 13 of the RE Act requires RUS to use US Census Bureau definitions for classifying areas as urban and rural.

Prior to the 2000 Census, the Census Bureau method of determining rural verses urban areas was relatively straight forward. Rural was considered to be any place with population fewer than 2500 people and not within the boundaries of an urbanized area. This method changed in 2002, and this change has the potential to significantly impact how RUS determines eligible facilities.

The new method for classifying urban and rural areas was published in the *Federal Register* (Vol. 67, No. 51) on March 15, 2002. Definitions for the two types of urban areas per the 2000 Census methodology are as follows[7].

Urban Cluster

An urban cluster (UC) consists of densely settled territory that has at least 2,500 people but fewer than 50,000 people. (A UC can have 50,000 or more people if fewer than 35,000 people live in an area that is not part of a military reservation.) The U.S. Census Bureau introduced the UC for Census 2000 to provide a more consistent and accurate measure of the population concentration in and around places. UC's replace the provision in the 1990 and previous censuses that defined as urban only those places with 2,500 or more people located outside of urbanized areas.

Urbanized Area

An urbanized area (UA) consists of densely settled territory that contains 50,000 or more people. The U.S. Census Bureau delineates UAs to provide a better separation of urban and rural territory, population, and housing in the vicinity of large places. At least 35,000 people in a UA must live in an area that is not part of a military reservation.

The Census Bureau estimates that, as a result of the new urban / rural classifications, 3% more people are now designated as living in urban areas, however 7% less land area is designated urban[8].

The key to this change in definition is the focus on population **density** rather than total population. Another important aspect of this change is the fact that these new urban areas are built from the most basic census geography, the block and block group. The primary implication of this change is that urban area boundaries no longer comport with place (city, town, or

[7] Source: http://www.census.gov/geo/www/tiger/glossry2.pdf
[8] http://www.census.gov/geo/www/tiger/glossary.html#urbanandrural

municipality) boundaries, as they did prior to this change. This is the driving force behind the need for analysis tools which use geospatial data.

Geographic Information Systems (GIS) allow users to overlay different types of geo-referenced data. With this capability, it can be determined how a utility's service territory map or a map of proposed construction projects compares to a map layer containing urban area boundaries per the new Census classifications.

RUS is currently in the process of developing staff recommendations for determining eligible facilities in light of these changes. Financing eligibility determinations for projects are complicated by several factors, these include, but are not limited to 1) the status of borrowers (current or new/returning), 2) the types of projects (upgrades, replacements, network, direct service, etc.) to be financed, and 3) the degree to which the facilities serve rural versus urban load. One thing, however, is clear; RUS will increasingly be turning to GIS solutions for help in making these important decisions.

For more information on current Census Bureau urban / rural classifications, visit the *Census 2000 Urban and Rural Classification* page[9] on the Census website. To check the current classification of a location in your service territory, detailed maps can be accessed via the American FactFinder Reference Maps[10], also located on the Census website.

If you would like more information or have any questions, please contact Chris Tuttle, Economist, Energy Forecasting Branch, at 202-205-3655 or at Chris.Tuttle@usda.gov.

[9] http://www.census.gov/geo/www/ua/ua_2k.html
[10] http://factfinder.census.gov/servlet/ReferenceMapFramesetServlet?_lang=en

## APPENDIX A

# Selected Metric Conversion Factors

| TO CONVERT FROM: | TO: | MULTIPLY BY: |
|---|---|---|
| Inch (in) | Centimeter (cm) | 2.54 |
| Foot (ft) | Meter (m) | 0.3048 |
| Mile (mi) | Kilometer (km) | 1.609 |
| Pound (lb) | Newton (N) | 4.448 |
| Gallon | Liter | 3.785 |

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**APPENDIX B**

# RURAL UTILITIES SERVICE ELECTRIC STAFF DIVISION

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*As of August, 2003. For updated information, see: http://www.usda.gov/rus/electric/contacts/esd.htm.*

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# APPENDIX C

## NRECA TRANSMISSION & DISTRIBUTION ENGINEERING COMMITTEE

| MEMBER | ORGANIZATION | LOCATION |
|---|---|---|
| **Committee Chair** | | |
| **Max Davis** | South Alabama Elec Co-op | Troy, AL |
| **NRECA Staff Coordinators** | | |
| **Steve Lindenberg** | NRECA | Arlington, VA |
| **Mike Pehosh** | NRECA | Arlington, VA |
| **Bob Saint** | NRECA | Arlington, VA |
| **Materials Subcommittee** | | |
| **John Mitchell, Chair** | Rappahannock EC | Fredericksburg, VA |
| **Harvey Bowles** | RUS | Washington, DC |
| **Susan Brouse** | Great River Energy | Elk River, MN |
| **Tom Denison** | Cobb EMC | Marietta, GA |
| **Charles Emerson** | Trico EC | Tucson, AZ |
| **George Keel** | RUS | Washington, DC |
| **Carl Liles** | Western Farmers EC | Anadarko, OK |
| **Peter Platz** | Coast EPA | Bay St. Louis, MS |
| **Scott Wehler** | Adams Electric Co-op | Gettysburg, PA |
| **Overhead Distribution Lines Subcommittee** | | |
| **Terry Rosenthal, Chair** | Laclede EC | Lebanon, MO |
| **Jim Bohlk** | RUS | Washington, DC |
| **James Byrne** | Poudre Valley REA | Fort Collins, CO |
| **Titus (Ty) Diamond** | Flint Energy | Warner Robbins, GA |
| **Allan Glidewell** | Southwest Tennessee EMC | Brownsville, TN |
| **Tom Hoffman** | Agralite Electric Co-op | Benson, MN |
| **Brian Nelson** | Intercounty ECA | Licking, MO |
| **Ernest Neubauer** | Pioneer Electric Co-op | Piqua, OH |
| **Gene Smith** | SGS Witter, Inc. | Lubbock, TX |
| **Tom Suggs** | Middle Tennessee EMC | Murfreesboro, TN |

# APPENDIX C

## NRECA TRANSMISSION & DISTRIBUTION ENGINEERING COMMITTEE

| MEMBER | ORGANIZATION | LOCATION |
|---|---|---|
| **Substation Subcommittee** | | |
| **Bill Kahanek, Chair** | Lower Colorado River Auth. | Austin, TX |
| **Jim Bardwell** | SGS Witter, Inc. | Albuquerque, NM |
| **Mike Eskandary** | RUS | Washington, DC |
| **Jerrod Howard** | Central Electric Power Co-op | Columbia, SC |
| **Ken Malone** | Middle Tennessee EMC | Murfreesboro, TN |
| **Tom Myers** | Berkeley EC | Moncks Corner, SC |
| **Paul Rupard** | East Kentucky Power Co-op | Winchester, KY |
| **Allen Xi** | Burns & McDonnell | Houston, TX |
| **System Planning Subcommittee** | | |
| **Robin Blanton, Chair** | Piedmont EMC | Hillsborough, NC |
| **Mark Barbee** | Kansas Electric Power Co-op | Topeka, KS |
| **Robert Dew** | Power Tech Engineering | Norcross, GA |
| **Joe Dorough** | Jackson EMC | Jefferson, GA |
| **Ronnie Frizzell** | Arkansas EC Corp. | Little Rock, AR |
| **Dee Futz** | Chugach EA | Anchorage, AK |
| **David Garrison** | Allgeier Martin & Associates | Okmulgee, OK |
| **Wayne Henson** | East Mississippi EPA | Meridian, MS |
| **Joe Perry** | Patterson & Dewar Engr. | Decatur, GA |
| **Ryan Smoak** | McCall-Thomas Engineering | Orangeburg, SC |
| **Georg Shultz** | RUS | Washington, DC |
| **Brian Tomlinson** | Conserv Energy | |
| **Chris Tuttle** | RUS | Washington, DC |
| **Kenneth Winder** | Moon Lake Electric | Roosevelt, UT |
| **Power Quality Subcommittee** | | |
| **Harold Taylor, Chair** | Georgia Transmission Corp | Tucker, GA |
| **Ed Bevers** | Rural Electric Co-op., Inc. | Lindsay, OK |
| **Chris Brewer** | Blue Grass Energy Co-op | Nicholasville, KY |
| **Corbitt Clift** | Cobb EMC | Marietta, GA |
| **Brian Coate** | Tipmont REMC | Linden, IN |
| **Peter Daly** | Power System Engineering | Madison, WI |

# APPENDIX C

## NRECA TRANSMISSION & DISTRIBUTION ENGINEERING COMMITTEE

| MEMBER | ORGANIZATION | LOCATION |
|---|---|---|
| **Herman Dyal** | Clay Electric Cooperative | Keystone Heights, FL |
| **Gary Grubbs** | Farmers RECC | Glasgow, KY |
| **Greg Hataway** | Alabama Electric Co-op | Andalusia, AL |
| **Ken Kjar** | Cass County Electric Co-op | Kindred, ND |
| **Wally Lang** | Minnkota Power Co-op | Grand Forks, ND |
| **Chris Melhorn** | EPRI PEAC Corporation | Knoxville, TN |
| **David Mueller** | Electrotek Concepts, Inc. | Knoxville, TN |
| **Jim Newberg** | Missoula Electric Co-op | Missoula, MT |
| **John Pavek** | RUS | Washington, DC |
| **Tim Pierce** | Great River Energy | Elk River, MN |
| **Chris Perry** | Nolin RECC | Elizabethtown, KY |
| **Jeff Pogue** | Wabash Valley Power Assoc | Indianapolis, IN |
| **Timothy Roscoe** | RUS | Washington, DC |
| **Lewis Shaw** | Brunswick EMC | Shallotte, NC |
| **Michael Watson** | Duck River EMC | Shelbyville, TN |
| **Jim Worley** | East Kentucky Power Co-op | Winchester, KY |
| **Transmission Lines Subcommittee** | | |
| **John Burch, Chair** | Florida Keys EC | Tavernier, FL |
| **Dominic Ballard** | East Kentucky Power Co-op | Winchester, KY |
| **Don Heald** | RUS | Washington, DC |
| **Charles Lukkarila** | Great River Energy | Elk River, MN |
| **Charles (Bubba) McCall** | Georgia Transmission Corp. | Tucker, GA |
| **Steve Mundorff** | Tri-State G&T Association | Denver, CO |
| **Norris Nicholson** | RUS | Washington, DC |
| **Bob Oldham** | Southern Maryland EC | Hughesville, MD |
| **Art Smith** | Patterson & Dewar Engr. | Decatur, GA |
| **David Turner** | Lower Colorado River Auth. | Austin, TX |
| **John Twitty** | Alabama EC | Andalusia, AL |

# APPENDIX C

## NRECA TRANSMISSION & DISTRIBUTION ENGINEERING COMMITTEE

| MEMBER | ORGANIZATION | LOCATION |
|---|---|---|
| **Underground Distribution Subcommittee** | | |
| **Ace Necaise, Chair** | Singing River EPA | Lucedale, MS |
| **Russ Dantzler** | Mid-Carolina EC | Lexington, SC |
| **Berl Davis** | Palmetto EC | Hilton Head, SC |
| **William Duke** | Allgeier Martin & Associates | Okmulgee, OK |
| **Steven Gwin** | Middle Tennessee EMC | Murfreesboro, TN |
| **Vince Heuser** | Nolin RECC | Elizabethtown, KY |
| **Trung Hiu** | RUS | Washington, DC |
| **Tim Mobley** | Berkeley EC | Moncks Corner, SC |
| **John Rodgers** | Nodak EC, Inc. | Grand Forks, ND |
| **Les Shankland** | Mountain Parks Electric | Granby, CO |
| **Blaine Strampe** | Federated REA | Jackson, MN |
| **Ed Thomas** | Utility Elec. Consultants | Raleigh, NC |
| | | |