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**PART 1728 -- ELECTRIC STANDARDS AND SPECIFICATIONS FOR MATERIALS  
AND CONSTRUCTION**

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1728.201 RUS Bulletin 1728H-701, RUS Specification for Wood Crossarms (Solid and Laminated), Transmission Timbers and Pole Keys.

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Authority: 7 U.S.C. 901 et seq.; 7 U.S.C. 1921 et seq.;  
Pub. L. 103 - 354, 108 Stat. 3178 (7 U.S.C. 6941 et seq.).

Editorial Note: Nomenclature changes to part 1728 appear  
at 55 FR 39397, Sept. 27, 1990.

**§1728.10 General purpose and scope.**

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(a) The requirements of this part are based on contractual provisions between RUS and the organizations which receive financial assistance from RUS.

(b) RUS will establish certain specifications and standards for materials, equipment, and construction units that will be acceptable for RUS financial assistance for the electric program. Materials and equipment purchased by the electric borrowers or accepted as contractor-furnished material must conform to RUS standards and specifications where they have been established and, if included in RUS Bulletin 43 - 5, ``List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers'' (List of Materials), must be selected from that list or must have received technical acceptance from RUS. RUS, through its Technical Standards Committees, will evaluate certain materials, equipment and construction units, and will determine acceptance.

[50 FR 47710, Nov. 20, 1985. Redesignated at 55 FR 39395, Sept. 27, 1990]

#### **§1728.20 Establishment of standards and specifications.**

(a) National and other standards. RUS will utilize standards of national standardizing groups, such as the American National Standards Institute (ANSI), American Wood Preservers' Association (AWPA), the various national engineering societies and the National Electrical Safety Code (NESC), to the greatest extent practical. When there are no national standards or when RUS determines that the existing national standards are not adequate for rural electric systems, RUS will prepare standards for material and equipment to be used on systems of electric borrowers. RUS standards and specifications will be codified or listed in §1728.97, Incorporation by Reference of Electric Standards and Specifications. RUS will also prepare specifications for materials and equipment when it determines that such specifications will result in reduced costs, improved

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materials and equipment, or in the more effective use of engineering services.

(b) Deviations from Standards. No member of the RUS staff will be permitted to authorize deviations from the standard specifications, or to establish or change the technical standards, or to authorize the use of items that have not received acceptance by the Technical Standards Committees, except as provided for under §1728.70, or by authorization and/or delegation of authority by the Administrator of RUS.

(c) Category of Items. Items appearing in the List of Materials are listed by categories of generic items which are used in RUS construction standards incorporated by reference in §1728.97. RUS will establish and define these categories and will establish all criteria for acceptability within these categories.

[50 FR 47710, Nov. 20, 1985. Redesignated at 55 FR 39395, Sept. 27, 1990, and amended at 55 FR 53487, Dec. 31, 1990]

**§1728.30 Inclusion of an item for listing or technical acceptance.**

(a) Scope. RUS, through its Technical Standards Committees ``A'' and ``B'' will determine the acceptability of certain standards, standard specifications, standard drawings, and items of materials and equipment to be used in transmission, distribution and general plant (excluding office equipment, tools, and work equipment, and consumer-owned electric wiring facilities).

(b) Addresses of Committees. The address of Technical Standards Committee ``A'' is: Chairman, Technical Standards Committee ``A'' (Electric), Rural Utilities Service, U.S. Department of Agriculture, Washington, DC 20250 - 1500. The address of Technical Standards Committee ``B'' is: Chairman, Technical Standards Committee ``B'' (Electric), Rural Utilities Service, U.S. Department of Agriculture, Washington, DC 20250 - 1500.

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(c) Review by Technical Standards Committee ``A''. All proposals for listing a product in the List of Materials must be addressed to Technical Standards Committee ``A.'' This committee will consider all proposals made by sponsors of specifications, drawings, materials, or equipment in categories for which RUS has established criteria for acceptability. A sponsor may be a manufacturer, supplier, contractor or any other person or organization which has made an application for listing or has requested an action by the committee. Committee ``A'' will consider all relevant information presented in determining whether an item should be accepted by Technical Standards Committee ``A.'' Formal rules of evidence and procedure shall not apply to proceedings before this committee.

(d) Action by Technical Standards Committee ``A''. (1) Committee ``A'' may take one of the following actions:

(i) Accept an item for listing without conditions (domestic items only),

(ii) Reject an item (domestic or nondomestic),\1\  
(FOOTNOTE)

(FOOTNOTE) \1\Nondomestic items are items which do not qualify as domestic products pursuant to RUS ``Buy American'' requirement.

(iii) Accept an item for listing with conditions (domestic items only),

(iv) Table an item for a time period sufficient to allow the sponsor to be notified and furnish additional information (domestic or nondomestic),

(v) Grant technical acceptance with or without conditions for a period of one year from the date of notification by RUS (nondomestic items only).

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(2) All committee decisions regarding the actions listed above must be unanimous. If the vote is not unanimous, the item shall be referred to Technical Standards Committee ``B.'' Written notice of Technical Standards Committee ``A's'' decision, stating the basis for the decision, will be provided to the sponsor.

(3) Items accepted without conditions by the Technical Standards Committees will be considered to be accepted on a general basis. No restrictions as to quantity or application will be placed on items which have received general acceptance. Items accepted subject to certain conditions, such as limited use to gain service experience, or limited use appropriate to certain areas and conditions, will be considered to be accepted on a conditional basis. The conditions will be cited as a part of the listing provided for in §1728.60, or as part of the technical acceptance for nondomestic items.

(e) Appeal to Technical Standards Committee ``B''. A sponsor may request a review of an adverse decision by Technical Standards Committee ``A'' within ten (10) days of notification of such decision by submitting a letter requesting such review to Technical Standards Committee ``B'' (Electric).

(f) Action by Technical Standards Committee ``B''. Committee ``B'' may take any of the actions listed for Committee ``A'' in §1728.30(d). However, for a Committee ``B'' action to be effective it must be by majority vote. Failure to obtain a majority on one of the proposed actions shall mean that the product will not be listed or accepted. Committee ``B's'' determination shall be based on the record developed before Committee ``A'' and such additional information as Committee ``B'' may request. Formal rules of procedure and evidence shall not apply to proceedings before Committee ``B.'' Written notice of Committee ``B's'' decision, stating the basis of the decision, will be provided to the sponsor.

(g) Appeal to the Administrator. In the event of an adverse decision by Committee ``B,'' the sponsor may, within ten (10) days of notification of such decision, request a review of

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this decision by submitting a letter to the Administrator requesting such a review.

(h) Change in Design. RUS acceptance of an item will be conditioned on the understanding that no design changes (material or dimensions) affecting the quality, strength, or electrical characteristics of the item shall be made without prior concurrence of Technical Standards Committee ``A.''

[50 FR 47711, Nov. 20, 1985. Redesignated at 55 FR 39395, Sept. 27, 1990]

**§1728.40 Procedure for submission of a proposal.**

(a) Written Request. Consideration of an item of material or equipment will be obtained by the sponsor through the submission of a written request in an original and five copies addressed to the Chairman, Technical Standards Committee ``A' (Electric). The letter must include the catalog number or other identifying number or code as well as a description of the item. In the event that an item being submitted is also intended for consideration by Technical Standards Committee ``A' (Telephone), a separate request must be made to the telephone committee. (See part 1755 of this chapter).

(b) Technical and Performance Data. Six copies of the specification of manufacture, drawings and test data must be submitted to the committee. Six copies of the performance history shall also be submitted unless RUS determines that such performance history is not reasonably available.

(c) Sample. One sample of the item must be submitted to the Chairman, Technical Standards Committee ``A,' unless RUS waives the requirements of the sample. In case of large, bulky or extremely heavy samples, the sponsor should contact the Chairman, Technical Standards Committee ``A' (Electric), at the above address, before any sample is shipped.

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(d) Action on Proposal. RUS will inform a sponsor of the action taken on the sponsor's proposal.

[50 FR 47711, Nov. 20, 1985. Redesignated at 55 FR 39395, Sept. 27, 1990]

**§1728.50 Removal of an item from listing or technical acceptance.**

(a) Removal Actions. An item of material or equipment may be removed from the listing or technical acceptance in accordance with the following procedures upon determination that the item is unsatisfactory or has been misrepresented to the owner or RUS.

(b) Notification by the Committee. The sponsor of an item of material or equipment will be notified in writing of a proposal to remove such item from the listing or technical acceptance.

(c) Supplemental Information. Within ten (10) days of receipt of such notification, the sponsor may submit to Committee ``A'' a letter expressing the sponsor's intent to submit written supplemental technical information relevant to Committee ``A's'' determination. The sponsor must submit such information within twenty (20) days from the submission of its letter to Committee ``A.'' Committee ``A'' will have the discretion of making a decision following the expiration of the time periods provided in this paragraph.

(d) Review by the Technical Standards Committee ``A''. Committee ``A'' will consider all relevant information presented in determining whether an item should be removed from the listing or technical acceptance. Formal rules of evidence and procedure shall not apply to proceedings before Technical Standards Committee ``A.''

(e) Action by the Technical Standards Committee ``A''. Committee ``A'' may take one of the following actions:

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- (1) Order the immediate removal of the item from the listing, or technical acceptance,
- (2) Condition the item's continued listing, or technical acceptance,
- (3) Recommend a basis of settlement which will adequately protect the interest of the Government, or
- (4) Delay the effectiveness of its decision for a time period sufficient to allow the sponsor to appeal to Technical Standards Committee ``B.''

All committee ``A'' decisions regarding the actions listed above must be by unanimous vote. If the vote is not unanimous, the item will be referred to Technical Standards Committee ``B.''

Written notice of Technical Standards Committee ``A's'' decision, stating the basis for the decision, will be provided to the sponsor.

(f) Additional Opportunity to Present Information. At the request of the sponsor, RUS may afford additional opportunity for consideration of relevant information. Such additional opportunity may include, without limitation, a meeting between RUS and the sponsor in such a forum that RUS may determine. In making this decision, RUS will consider, among other things, the best interests of RUS, its borrowers, and the sponsor, and the best manner to develop sufficient information relating to the proposed action.

(g) Appeal to the Technical Standards Committee ``B''. Within ten (10) days of notification of Committee ``A's'' decision, a sponsor may appeal in writing to Technical Standards Committee ``B'' to review Committee ``A's'' decision, specifying the reasons for such a request. Committee ``B's'' determination, in response to such request, shall be based on the record developed before Committee ``A'' and such additional information

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as Committee ``B'' may request. Formal rules of procedure and evidence shall not apply to proceedings before Committee ``B.''

(h) Action by Technical Standards Committee ``B''. Committee ``B,''' by majority vote, may take one of the following actions:

(1) Order the immediate removal of the item from listing, or technical acceptance,

(2) Condition the item's continued listing, or technical acceptance,

(3) Recommend a basis of settlement which adequately protects the interests of the Government, or

(4) Delay the effectiveness of its decision for a time period sufficient to allow the sponsor to appeal to the Administrator of RUS.

Failure to obtain a majority vote on any of the above actions shall mean that the product will continue to be listed or accepted.

Written notice of Committee ``B's'' decision stating the basis of the decision will be provided to the sponsor.

(i) Appeal to the Administrator. Within ten (10) days of the receipt of Committee ``B's'' decision, a sponsor may appeal to the Administrator to review Committee ``B's'' decision. If an appeal is made, the sponsor shall submit a written request to the Administrator, Rural Utilities Service, Room 4053, South Building, U.S. Department of Agriculture, Washington, DC 20250 - 1500 specifying the reasons to request reconsideration. The Administrator will have the option to decline the request, in which case the decision of Committee ``B'' shall stand. If a review is granted, the determination by the Administrator or the Administrator's designee shall be based on the record developed before Committee ``A'' and Committee ``B'' and such additional

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information as the Administrator may request. Formal rules of procedure and evidence shall not apply to the actions of the Administrator.

(j) Action by the Administrator. The Administrator may take one of the following actions:

(1) Order the immediate removal of the item from the listing, or technical acceptance,

(2) Condition its continued listing, or technical acceptance, or

(3) Recommend a basis of settlement which adequately protects the interests of the Government.

Written notice of the Administrator's determination, stating the basis for the decision, will be provided to the sponsor.

The Administrator's actions are final.

[50 FR 47711, Nov. 20, 1985. Redesignated at 55 FR 39395, Sept. 27, 1990]

#### **§1728.60 List of materials and equipment.**

(a) General. Those items of material or equipment accepted by Technical Standards Committee ``A'' or ``B,''' with the exception of technically accepted nondomestic items, will be listed in the List of Materials. Items which do not qualify as domestic products may be accepted on a technical basis only (technical acceptance) for a period of one year as provided in §1728.30(c)(1) and will not be included in the List of Materials.

(b) Publishing and Revisions. RUS will reissue the List of Materials every year, dated July, and issue supplements, if needed, dated October, January, and April of every year. An RUS office copy, which is the official current copy, of the List of

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Materials, will be updated every time changes are made by the Technical Standards Committees.

(c) Dual Listings. RUS, through its Technical Standards Committees, will accept for listing only one item of a particular type of material or equipment for each manufacturer. If a manufacturer submits an item to perform the identical function of a listed item, RUS, through its Technical Standards Committees, may accept that item and remove the one previously listed. RUS will list only new items of material and equipment in the List of Materials. Used items will not be considered for listing.

[50 FR 47712, Nov. 20, 1985. Redesignated at 55 FR 39395, Sept. 27, 1990]

#### **§1728.70 Procurement of materials.**

(a) By Owner. When purchasing the type of materials included in the List of Materials, RUS borrowers shall purchase only materials listed in the List of Materials, or materials which have a current technical acceptance by RUS and meet the ``Buy American'' requirement.

(b) By Contractor. When performing work for an RUS borrower, contractors shall supply only items from the general acceptance pages of the List of Materials, or obtain the borrower's concurrence prior to purchase and use of a technically nondomestic item or any item listed on a conditional basis.

(c) Procurement of Unlisted Items. (1) The borrower shall request prior approval from RUS for use of an item that does not fall in categories established by RUS in the List of Materials for which acceptability has been established by the Technical Standards Committees.

(2) RUS will also determine, on a case-by-case basis, whether to allow use of an unlisted item in emergency situations and for experimental use or to meet a specific need. For purposes of this Part 1728, an emergency shall mean a situation wherein

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the supply of listed material and equipment from the industry is not readily available, or the standard designs are not applicable to the borrower's specific problem under consideration.

(3) RUS will make arrangements for test or experimental use of newly developed items requiring limited trial use. RUS, working with the borrower and the manufacturer, will establish test locations for the items to facilitate installation and observation.

[50 FR 47712, Nov. 20, 1985. Redesignated at 55 FR 39395, Sept. 27, 1990]

**§1728.97 Incorporation by reference of electric standards and specifications.**

(a) The following electric bulletins have been approved for incorporation by reference by the Director of the Office of the Federal Register. The bulletins containing construction standard (50 - 1 to 50 - 14) and Bulletin 50 - 18 (DT - 5C), may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The bulletins containing specifications for materials and equipment (50 - 15 to 50 - 99) may be obtained from the Rural Utilities Service, Administrative Services Division, Room 0175 - S, Washington, DC 20250. The terms ``RUS form'', ``RUS standard form'', ``RUS specification'', and ``RUS bulletin'' have the same meanings as the terms ``REA form'', ``REA standard form'', ``REA specification'', and ``REA bulletin'', respectively unless otherwise indicated.

The bulletins are available for inspection at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC. These materials are incorporated as they exist on the date of the approval and a notice of any change in these materials will be published in the Federal Register.

(b) List of Bulletins.

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Bulletin 50 - 1 (T - 805 - B), Electric Transmission  
Specifications and Drawings for 115 kV to 230 kV (10 - 88)

Bulletin 50 - 2 (T - 805 - A), Electric Transmission  
Specifications and Drawings for 34.5 kV to 69 kV (2 - 73)

Bulletin 50 - 3 (D - 804), Specifications and Drawings for  
12.5/7.2 kV Line Construction (4 - 83)

Bulletin 50 - 4 (D - 801), Specification and Drawings for  
34.5/19.9 kV Distribution Line Construction (11 - 86)

Bulletin 50 - 5 (D - 803), Specifications and Drawings for  
14.4/24.9 kV Line Construction (9 - 69)

Bulletin 50 - 6 (D - 806), Specifications and Drawings for  
Underground Electric Distribution (3 - 90)

Bulletin 50 - 15 (DT - 3), RUS Specifications for Pole Top Pins  
with 1 3/8" Diameter Lead Thread (1 - 51)

Bulletin 50 - 16 (DT - 4), RUS Specifications for Angle  
Suspension Brackets (3 - 52)

Bulletin 50 - 19 (DT - 7), RUS Specifications for Clevis Bolts (8  
- 53)

Bulletin 50 - 23 (DT - 18), RUS Specifications for 60" Wood  
Crossarm Braces (2 - 71)

Bulletin 50 - 31 (D - 3), RUS Specifications for Pole Top Pins  
with 1" Diameter Lead Threads (2 - 79)

Bulletin 50 - 32 (D - 4), RUS Specifications for Steel Crossarm  
Mounted Pins with 1" Diameter Lead Threads (10 - 50)

Bulletin 50 - 33 (D - 5), RUS Specifications for Single and  
Double Upset Spool Bolts (2 - 51)

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Bulletin 50 - 34 (D - 6), RUS Specifications for Secondary Swinging Clevises (12 - 70)

Bulletin 50 - 35 (D - 7), RUS Specifications for Service Swinging Clevises (9 - 52)

Bulletin 50 - 36 (D - 8), RUS Specifications for Service Deadend Clevises (9 - 52)

Bulletin 50 - 40 (D - 14), RUS Specifications for Pole Top Brackets for Channel Type Pins (9 - 51)

Bulletin 50 - 41 (D - 15), RUS Specifications for Service Wireholders (11 - 51)

Bulletin 50 - 55 (T - 2), RUS Specifications for Overhead Ground Wire Support Brackets (5 - 53)

Bulletin 50 - 56 (T - 3), RUS Specifications for Steel Plate Anchors for Transmission Lines (12 - 53)

Bulletin 50 - 60 (T - 9), RUS Specification -- Single Pole Steel Structures, Complete with Arms (12 - 71)

Bulletin 50 - 70 (U - 1), RUS Specification for 15 kV and 25 kV Primary Underground Power Cable (12 - 22 - 87)

Bulletin 50 - 72 (U - 4), RUS Specification for Electrical Equipment Enclosures (5 - 35 kV) (10 - 79)

Bulletin 50 - 73 (U - 5), RUS Specifications for Pad-Mounted Transformers (Single and Three-Phase) (1 - 77)

Bulletin 50 - 74 (U - 6), RUS Specification for Secondary Pedestals (600 Volts and Below) (10 - 79)

Bulletin 50 - 91 (S - 3), RUS Specifications for Step-Down Distribution Substation Transformers (34.4 - 138 kV) (1 - 78)

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Bulletin 1728F-700, ``RUS Specification for Wood Poles, Stubs and Anchor Logs'' (August 1993).

[48 FR 31853, July 12, 1983, as amended at 52 FR 22289, June 11, 1987; 52 FR 48799, Dec. 28, 1987; 53 FR 39229, Oct. 6, 1988; 53 FR 44176, Nov. 2, 1988; 55 FR 8909, Mar. 9, 1990. Redesignated at 55 FR 39395, Sept. 27, 1990, as amended at 56 FR 1563, Jan. 16, 1991; 58 FR 41398, Aug. 3, 1993; 59 FR 66440, Dec. 27, 1994]

**§1728.201 RUS Bulletin 1728H-701, RUS Specification for Wood Crossarms (Solid and Laminated), Transmission Timbers and Pole Keys.**

(a) General provisions. (1) This section implements contractual provisions between RUS and borrowers receiving financial assistance from RUS. The contractual agreement between RUS and its borrowers requires the borrower's system to be constructed in accordance with RUS accepted plans and specifications. Each RUS electric borrower must purchase only wood crossarms produced in accordance with the specification in this section.

(2) Each RUS electric borrower shall require each contractor to agree in writing to furnish only materials produced in accordance with the specification in this section.

(3) This specification describes the minimum acceptable quality of wood distribution crossarms and transmission crossarms (hereinafter called crossarms) that are purchased by or for RUS borrowers. Where there is conflict between this specification and any other specification referred to in this section, this specification shall govern.

(4) Various requirements relating to quality control and inspection are contained in §1728.202 of this part, RUS Specification for Quality Control and Inspection of Timber Products. Section 1728.201 of this part and the American National Standards Institute (ANSI) 05.2, 1983, American National Standard for Wood Products -- Structural Glued Laminated Timber for

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Utility Structures, shall be followed exactly and shall not be interpreted or subjected to judgment by the quality control person or an independent inspector.

(5) The borrower shall purchase from producers only material that meets the requirements of this specification. Each purchaser shall use a written purchase order to purchase material for use in RUS financed systems in order to insure compliance with the standards and specifications of this part. The written purchase order shall contain a provision that specifically requires the producer to comply with the provisions of this part. The purchase order shall contain a provision that specifically requires the producer to make the treating plant, and storage areas available, during normal business hours, in order for representatives of either the purchaser or RUS to inspect such to determine compliance with the standards and specifications of this part.

(6) The borrower shall insure that the producer provides the inspectors with full information (drawings, etc.) relating to the requirements contained in purchase order which is supplementary to this specification.

(7) The borrower shall insure that the producer maintains, or has access to, adequate laboratory facilities at or very near the treating plant. All chemical tests, assays or analyses associated with the treatment shall be independently performed in this laboratory by both the quality control designee and the borrower's inspector. If acceptable to RUS on a case-by-case basis, the producer may use a central laboratory.

(8) Inspection and treatment of all timber products produced under this specification should be performed after receipt of the order from the purchaser, except as provided for reserve treated stock.

(9) The borrower shall insure that each inspection agency maintains its own central laboratory with qualified staff capable of completely analyzing the preservative and treatments. If

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acceptable to RUS, this central laboratory may be used for the independent inspector's routine assays, with results made available the next working day.

(10) The testing and inspection of the lamination process shall be in accordance with American Institute of Timber Construction (AITC) 200 - 83, Inspection Manual.

(11) With the exception of reserve treated stock, all invoices for treated timber products shall be accompanied, in duplicate, by a copy of the producer's Certificate of Compliance and a copy of either the Independent Inspection Report or a Quality Assurance Plan Certificate. The certificate shall be presented to the purchaser with the invoice. For reserve treated stock, inspection reports shall be available from the inspection agency. When shipped from reserve stock, the invoice shall bear an endorsement and a further certification by the producer that the material meets the requirements of this specification and any supplementary requirements cited in the purchase order under which it is purchased.

(12) Crossarms shall be warranted to conform to this specification. If any crossarm is determined to be defective or does not conform to this specification within 1 year after shipment to the borrower, it shall be replaced as promptly as possible by the producer. In the event of failure to do so, the purchaser may make such replacement and the cost of the crossarm, at destination, recoverable from the producer.

(b) Definitions.

Arm refers to structural wood member used to support electrical conductors.

Certificate of compliance is a certification by an authorized employee of the producer that the material shipped meets the requirements of this specification and any supplementary requirements specified in a purchase order from a borrower or the borrower's contractor.

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Crossarm is a term used interchangeably with arm.

Independent inspection relates to examination of material by an independent inspector employed by a commercial inspection agency.

Inspection means an examination of material in sufficient detail to insure conformity to all phases of the specification under which it was purchased.

Lot is a quantity of crossarms of like size, conditioning, and fabrication, usually making up one treating charge.

Producer is used to describe the party who manufactures and treats crossarms.

Purchaser refers to either the RUS borrower or contractors acting as the borrower's agent, except where a part of the specification specifically refers to only the RUS borrower or the contractor.

Quality control designee refers to an individual designated by the producer to be responsible for quality control.

Reserve treated stock consists of timber products treated in accordance with this specification, prior to and in anticipation of the receipt of specific orders, and held in storage ready for immediate shipment.

Supplier is a term used interchangeably with producer, or in some cases, may be the distributor selling crossarms to the borrower.

Treating plant is the organization that applies the preservative treatment to the crossarms.

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(c) Related specifications and standards incorporated by reference.

The following specifications and standards are incorporated by reference. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of each reference are available for inspection during normal business hours at RUS, room 1250-S, U.S. Department of Agriculture, Washington, DC 20250 or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC. Copies of these standards and specifications may be purchased from the addresses shown below.

(1) West Coast Lumber Inspection Bureau, Standard No. 17, Grading Rules for West Coast Lumber, September 1, 1991, available from West Coast Lumber Inspection Bureau, P.O. Box 23145, Portland, Oregon 97223, telephone (503) 639 - 0651, Fax (503) 684 - 8928.

(2) Southern Pine Inspection Bureau, Standard Grading Rules for Southern Pine Lumber, October 15, 1991, available from Southern Pine Inspection Bureau, 4709 Scenic Highway, Pensacola, Florida 32504, telephone (904) 434 - 2611.

(i) Southern Pine Inspection Bureau, Special Product Rules for Structural, Industrial, and Railroad-Freight Car Lumber, October 15, 1991, available from Southern Pine Inspection Bureau, 4709 Scenic Highway, Pensacola, Florida 32504, telephone (904) 434 - 2611.

(ii) [Reserved]

(3) American Wood Preservers' Association (AWPA), Book of Standards, 1991 edition, available from AWPA, P.O. Box 286, Woodstock, Maryland 21163 - 0286.

(i) A1 - 91, Standard Methods for Analysis of Creosote and Oil-Type Preservatives.

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(ii) A2 - 91, Standard Methods for Analysis of Waterborne Preservatives and Fire-Retardant Formulations.

(iii) A3 - 91, Standard Methods for Determining Penetration of Preservatives and Fire Retardants.

(iv) A5 - 91, Standard Methods for Analysis of Oil-Borne Preservatives.

(v) A6 - 89, Method for the Determination of Oil-Type Preservatives and Water in Wood.

(vi) A7 - 75, Standard Wet Ashing Procedure for Preparing Wood for Chemical Analysis.

(vii) A9 - 90, Standard Method for Analysis of Treated Wood and Treating Solutions by X-Ray Spectroscopy.

(viii) A11 - 83, Standard Method for Analysis of Treated Wood and Treating Solutions by Atomic Absorption Spectroscopy.

(ix) C1 - 91, All Timber Products -- Preservative Treatment by Pressure Processes.

(x) C4 - 91, Poles -- Preservative Treatment by Pressure Processes.

(xi) C8 - 91, Western Red Cedar and Alaska Yellow Cedar Poles -- Preservative Treatment by the Full-Length Thermal Process.

(xii) C10 - 91, Lodgepole Pine Poles -- Preservative Treatment by the Full-Length Thermal Process.

(xiii) C12 - 90, Western Larch Poles -- Full-Length Preservative Treatment by Thermal Process.

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(xiv) M1 - 90, Standard for the Purchase of Treated Wood Products.

(xv) M2 - 91, Standard for Inspection of Treated Timber Products.

(xvi) M3 - 81, Standard Quality Control Procedures for Wood Preserving Plants.

(xvii) M4 - 91, Standard for the Care of Preservative-Treated Wood Products.

(xviii) P1/P13 - 91, Standard for Coal Tar Creosote for Land and, Fresh Water and Marine (Coastal Water Use).

(xix) P5 - 91, Standards for Waterborne Preservatives.

(xx) P8 - 91, Standards for Oil-Borne Preservatives.

(xxi) P9 - 91, Standards for Solvents and Formulations for Organic Preservative Systems.

(4) American Institute of Timber Construction (AITC) 200 - 83, Inspection Manual, 1987 edition, available from AITC, 333 West Hampden Avenue, Englewood, Colorado 80110, telephone (303) 761 - 3212.

(5) American National Standards Institute (ANSI) 05.2 - 1983, American National Standard for Wood Products -- Structural Glued Laminated Timber for Utility Structures, available from ANSI, 1430 Broadway, New York, New York 10018.

(6) American Society for Testing and Materials (ASTM) D9 - 87 (1992), Standard Terminology Relating to Wood, available from ASTM, 1916 Race Street, Philadelphia, PA 19103 - 1187, telephone number (215) 299 - 5585.

(d) Independent inspection plan.

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This plan or a Quality Assurance Plan, as described in paragraph (e) of this section, is acceptable for supplying crossarms. All crossarms produced under the independent inspection plan for use on an RUS financed system shall be inspected by a qualified independent inspector in accordance with §1728.202 of this part.

(1) The borrower has the prerogative to contract directly with the inspection agency for service. The borrower should, where practical, select the inspection agency so that continual employment is dependent only on performance acceptable to the borrower and in accordance with this specification. The selected inspection agency shall not subcontract the service to any other inspection agency without the prior written consent by the borrower.

(2) The producer shall not be a party to the selection of the inspection agency by the borrower and shall not interfere with the work of the inspector, except to provide notification of the readiness of material for inspection. To obtain the inspection services for reserve stock, the producer may deal directly with the inspection agency. Under the Independent Inspection Plan, the producer shall not treat material before it has been properly inspected in the white, as evidenced by the inspector's hammer mark.

(3) The methods of inspection described in this section and in §1728.202 of this part shall be used no matter which plan crossarms are produced under, i.e., Independent Inspection Plan, or Quality Assurance Plans, as described in this section. The number of crossarms actually inspected by monitors of quality control under a Quality Assurance Plan may vary from the number of crossarms inspected under the Independent Inspection Plan.

(e) Quality assurance plans.

The producer shall furnish crossarms conforming to this specification as monitored by a Quality Assurance Plan acceptable to RUS. RUS borrower groups or agents for borrower groups

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endeavoring to operate Quality Assurance Plans shall submit their plan for assuring quality control to the Director, Electric Staff Division, Rural Utilities Service, Washington, DC 20250 - 1500, for specific approval prior to contracting with RUS borrowers under such plans.

(f) Material requirements -- (1) Material and grade. All crossarms furnished under this specification shall be free of brashy wood, decay, and insect holes larger than 3/32 of an inch (0.24 cm), and shall meet additional requirements as shown on specific drawings. They shall be made of one of the following:

(i) Douglas-fir which conforms to the applicable crossarm provisions of paragraphs 170 and 170a, or the applicable transmission arm provisions of paragraphs 169 and 169a of the 1991 Standard Grading Rules for West Coast Lumber No. 17. All references to Douglas-fir shall be of coastal origin;

(ii) Southern Yellow Pine which conforms to the provisions of Dense Industrial Crossarm 65, as described in paragraph 31.2 in Southern Pine Inspection Bureau 1991 Special Product Rules for Southern Pine; or

(iii) Laminated wood crossarms shall conform to ANSI 05.2 - 1983, and have at least the same load carrying capacity as the solid sawn arm it replaces. The load carrying capacity of the laminated arms shall be determined by one of the procedures outlined in ANSI 05.2.

(2) Borrowers may use alternative wood crossarms that are listed in RUS Bulletin 1728C-100, List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers.

(3) Knots. Sound, firm, and tight knots, if well spaced, are allowed.

(i) Slightly decayed knots are permitted, except on the top face, provided the decay extends no more than 3/4 of an inch (1.91 cm) into the knot and provided the cavities will drain

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water when the arm is installed. For knots to be considered well spaced, the sum of the sizes of all knots in any 6 inches (15.24 cm) of length of a piece shall not exceed twice the size of the largest knot permitted. More than one knot of maximum permissible size shall not be in the same 6 inches (15.24 cm) of length. Slightly decayed, firm, or sound ``Pin knots'' (3/8 of an inch (0.95 cm) or less) are not considered in size, spacing, or zone considerations.

(ii) Knots are subject to the following limits on size and

(TABLE START)location:

Knot Limits For Distribution Arms

DRAWING M-19 (SEE FIGURE 1, EXHIBIT A)

All Dimensions in Inches

(Table available on hard copy only)

(iii) Knot clusters shall be prohibited unless the entire cluster, measured on the worst face, is equal to or less than the round knot allowed at the specific location.

(iv) Spike knots shall be prohibited in deadend arms. Any spike knot across the top face shall be limited to the equivalent displacement of a knot 3/8 of an inch (0.95 cm) deep on one face and the maximum round knot for its particular location on the worst face, with a maximum width of 1 inch (2.54 cm) measured at the midpoint of the spiked section. Elsewhere across the bottom or side faces, spike knots shall not exceed 1/2 the equivalent displacement of a round knot permitted at that location, provided that the depth of the knot on the worst face shall not exceed the maximum round knot allowed at that location.

(v) Loose knots and knot holes shall drain water when the arm is normally installed. In the center section, upper half,

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they shall not be greater than 1/2 the dimensions of round knots. Elsewhere, they shall not be greater than the round knot dimension. They shall be prohibited in deadend arms.

(vi) All knots except those ``spike'' knots intersecting a corner shall be measured on the least diameter of the knot.

(vii) A knot shall be considered to occupy a specific zone or section if the center of the knot (i.e. pith of knot) is within the zone or on the zone's boundary.

(viii) If a round or oval knot appears on two faces and is in two zones, each face shall be judged independently. When this does not occur, average the least dimension showing on both faces. Knots which occur on only one face of a free of heart center (FOHC) arm shall be permitted to be 25 percent larger than the stated size.

(ix) Knot spacing. Two or more knots opposite each other on any face shall be limited by a sum not to exceed the size of a maximum single knot permitted for the location. On all four faces, all knots shall be well spaced.

(x) Knots which have a maximum of 5/8 inch (1.59 cm) diameter may intersect pin holes in the center section. One inch (2.54 cm) diameter knots may intersect pin holes elsewhere.

(4) Miscellaneous characteristics, features and requirements.

(i) The top face of distribution crossarms shall not have more than four medium pitch and bark pockets in 8 foot (2.4 m) arms, and not more than five pitch and bark pockets in 10 foot (3.0 m) arms. Elsewhere a maximum of six medium pockets in 8 foot (2.4 m) arms and eight in 10 foot (3.0 m) arms shall be permitted. Equivalent smaller pockets shall be permissible. An occasional large pocket is permissible.

(ii) Shakes shall be prohibited.

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(iii) Checks. Prior to treatment on properly seasoned arms, single face checks shall not exceed an average penetration of  $\frac{1}{4}$  the depth from any face and shall be limited to 10 inches (25.40 cm) long on the top face, and  $\frac{1}{3}$  the arm length on the other faces. Checks shall not be repeated in the same line of grain in adjacent pin holes. The sum of the average depths of checks occurring in the same plane on opposite faces shall be limited to  $\frac{1}{4}$  the face depth.

(iv) Compression wood shall be prohibited on any face. It is permitted if wholly enclosed in the arm, more than six annual rings from the surface, and not over  $\frac{3}{8}$  of an inch (0.95 cm) in width.

(v) Insect holes larger than  $\frac{3}{32}$  of an inch (0.24 cm) shall be prohibited. Pin holes (i.e. holes not over  $\frac{1}{16}$  of an inch (0.16 cm) diameter) shall be allowed if scattered and not exceeding 10 percent of the arm girth.

(vi) Wane shall be allowed on one edge, limited to approximately 1 inch (2.54 cm), measured across the corner. Outside of the top center section, an aggregate length not to exceed 2 feet may have wane up to 1 -  $\frac{1}{2}$  inches (3.81 cm) on an occasional piece on one or both edges. Bark shall be removed.

(vii) Prior to preservative treatment, crook, bow, or twist shall not exceed  $\frac{1}{2}$  of an inch (1.27 cm) in 8 foot arms (2.4 m) and  $\frac{5}{8}$  of an inch (1.59 cm) in 10 foot (3.0 m) arms.

(g) Manufacture. (1) All dimensions and tolerances shall conform to those shown on the drawings in this section or drawings supplied with the purchase order. Drawings supplied shall meet or exceed minimum dimensions and tolerances shown on the drawings in this section. Cross-sectional dimensions shall be measured and judged at about  $\frac{1}{4}$  the arm length, except when the defects of ``skip dressing'' or ``machine bite or offset'' are involved.

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(2) Lamination techniques shall comply with ANSI 05.2 - 1983.

(3) Pin and bolt holes shall be smoothly bored without undue splintering where drill bits break through the surface. The center of any hole shall be within 1/8 of an inch (0.32 cm) of the center-line locations on the face in which it appears. The holes shall be perpendicular to the starting and finishing faces.

(4) Shape. The shape of the arms at any cross section, except for permissible wane, shall be as shown on the respective drawings in this section or supplied with the order. The two top edges may be either chamfered or rounded 3/8 of an inch (0.95 cm) radius. The two bottom edges may be slightly eased 1/8 of an inch (0.32 cm) radius for the entire length.

(5) Incising. The lengthwise surfaces of Douglas-fir crossarms shall be incised approximately 1/4 of an inch (0.64 cm) deep. The incision shall be reasonably clean cut with a spacing pattern that insures uniform penetration of preservative.

(6) Workmanship. All crossarms shall be first quality workmanship. Crossarms shall be dressed on four sides, although ``hit and miss skips'' may occur on two adjacent faces on occasional pieces. Five (5) percent of a lot or shipment may be 1/8 of an inch (0.32 cm) scant in thickness or width at the ends for a length not exceeding 6 inches (15.24 cm), or may have 1/8 of an inch (0.32 cm) machine bite on offset.

(h) Conditioning prior to treatment. (1) All solid sawn crossarms shall be made of lumber which has been kiln-dried. Douglas-fir arms shall have an average moisture content of 19 percent or less, with a maximum not to exceed 22 percent. Southern Yellow Pine arms shall have an average moisture content of 22 percent or less, with a maximum not to exceed 30 percent.

(2) Moisture content levels shall be measured at about 1/4 the length and at a depth of about 1/5 the crossarm's thickness. Additionally, the moisture content gradient between

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the shell (i.e. 1/4 of an inch (0.64 cm) deep) and the core (i.e. about 1 inch (2.54 cm) deep) shall not exceed 5 percentage points.

(3) A minimum of at least 20 solid sawn crossarms per treating charge shall be measured to verify moisture content and shall be duly recorded by the quality control designee or independent inspector.

(4) The moisture content of lumber used in laminating shall, at the time of gluing, be within the range of 8 to 12 percent, inclusive.

(i) Preservatives. (1) The preservatives shall be:

(i) Creosote which conforms to the requirements of AWPA Standard P1 when analyzed in accordance with the methods in AWPA Standard A1, sections 2, 3, 4, either 5 or 9, and 6;

(ii) Pentachlorophenol which contains not less than 95 percent chlorinated phenols and conforms to AWPA Standard P8 when analyzed in accordance with AWPA Standard A5 or A9. The hydrocarbon solvents for introducing the preservative into the wood shall meet the requirements of AWPA Standard P9 Type A; or

(iii) Waterborne preservatives, which may only be one of the following:

(A) Ammoniacal Copper Arsenates (ACA) and Ammoniacal Copper Zinc Arsenate (ACZA) which shall meet the requirements of AWPA Standard P5, when analyzed in accordance with methods in AWPA Standards A2, A9, or A11; and

(B) Chromated Copper Arsenates (CCA) which shall meet the requirements of one of the formulations given in AWPA Standard P5, sections 4, 5 or 6, and 10. Tests to establish conformity shall be made in accordance with AWPA Standards A2, A9, or A11.

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(1) The pH of treating solutions of the waterborne preservatives shown in AWPA Standard P5, section 10, shall be determined in accordance with AWPA Standard A2, section 8.

(2) Waterborne preservatives are available either as oxides, which form non-ionizing chemical compounds in the wood, or as salts, which leave ionizing compounds as well as non-ionizing compounds in the wood. Salt formulations of a waterborne preservative are more corrosive to metal than the oxide formulation and may cause surface deposits. Unless otherwise specified in the purchase order, the oxide formulations of waterborne preservatives shall be supplied.

(3) Douglas-fir crossarms shall not be treated with CCA preservatives.

(4) Materials treated with waterborne preservatives shall be free of visible surface deposits.

(iv) Copper Naphthenate (CuN) concentrate used to prepare wood preserving solutions shall contain not less than 6 percent nor more than 8 percent copper in the form of Copper Naphthenate and shall conform to AWPA Standard P8 when analyzed in accordance with AWPA Standard A5. The hydrocarbon solvents for introducing the preservative into the wood shall meet the requirements of AWPA Standard P9 Type A.

(2) [Reserved]

(j) Preservative treatment. (1) All timber products treated under this specification shall be treated by either a pressure or a thermal (nonpressure) process.

(2) These materials may be further conditioned by steaming, or by heating in hot oil (Douglas-fir), within the following limits:

Time

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	Hours (max.)	Temperature Deg. F (max.)
Steam	3	220 (104.4C)
Heating in Preservative	3	210 (98.9C)

(3) A final steam or hot oil bath may be used only to meet cleanliness requirements of paragraph (k) of this section. Total duration of the final steam bath shall not exceed 2 hours and the temperature shall not exceed 240 degrees Fahrenheit (115.6C).

(k) Results of treatments. (1) The quality control designee shall test or supervise the testing of each treated charge for penetration and retention.

(2) Method of sampling. When testing penetration and retention, a borer core shall be taken from not less than 20 crossarms in each treating charge. The borings shall be taken from any face except the top face at a point as close to the end as possible, being at least 3 inches (7.62 cm) from the end of the arm and no closer than 3 inches (7.62 cm) from the edge of the holes. The bored holes shall be plugged with preservative-treated plugs driven into the arm. Borings from laminated arms shall not be taken from the same laminate unless there is an end joint separation.

(3) Penetration by the preservative, as determined in accordance with AWP Standard A3, shall be 100 percent of the sapwood in crossarms. In the heartwood of Douglas-fir crossarms, the penetration shall be not less than 3 inches (7.62 cm) longitudinally from the edge of holes and ends, and at least 3/16 inch (0.45 cm) from the surface of any face.

(4) Retention of preservative in the outer 6/10 of an inch (1.52 cm) for Douglas-fir and one inch (2.54 cm) for Southern Yellow Pine assay zones at the treating plant shall be not less than:

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<b>Preservative</b>	<b>Retention (pcf)</b>	<b>AWPA Analysis Method</b>
Creosote	8	A6
Pentachlorophenol	0.4*	A5
ACA, ACZA, or CCA	0.4	A2, A7, A9, or A11
Copper Naphthenate	0.04	A5, A9 or A11

(NOTE: Footnote available on hard copy only)

(5) Cleanliness of lengthwise surfaces of all crossarms shall be free from tarry, greasy, or sticky material, and from oil exudation and pentachlorophenol crystallization (blooming).

(6) Re-treatment of materials which do not meet the penetration and retention requirements of this specification may be done only twice. Initial treatment steaming time plus re-treatment steaming time, combined, shall not exceed time allowed in paragraph (i) of this section.

(1) Marks and brands. (1) All crossarms shall be branded (hot brand) or die-stamped legibly and to a depth of approximately 1/16 of an inch (0.16 cm) before treatment.

(2) The letters and figures shall be not less than 1/2 of an inch (1.27 cm) in height. The top of the brand shall be oriented to the top of the arm.

(3) The brand or die-stamp shall include:

(i) The manufacturer's identification symbol;

(ii) Month and year of manufacture;

(iii) Species of timber such as DF for Douglas-fir and SP for Southern Yellow Pine; and

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(iv) The preservative notated with a C for creosote, P for penta, S for salts, or N for Copper Naphthenate.

(4) An example is:

M-6 - 72 Manufacturer -- Month -- Year

DF-P Douglas-fir -- penta treated

(5) The brand or stamp shall be placed on either of the wide surfaces of the arms, oriented with letters right side up towards the top of the arm and preferably about 1 foot (30.48 cm) from the midpoint of the arm.

(6) The mark should be approximately the same location on each type of crossarm of each producer.

(7) Brands, inspection marks, or quality assurance marks shall be removed from arms that do not meet these specifications

(m) Storage. (1) Producers may treat crossarms for reserve stock under any of the RUS approved plans. Prior to treating reserve stock, and annually thereafter, producers shall notify the Director of the Electric Staff Division of their intent to treat reserve stock. The letter of notification shall be addressed to the Director, Electric Staff Division, Rural Utilities Service, Washington, DC 20250 - 1500.

(2) RUS shall acknowledge, by letter, each notification of intent to treat material for reserve stock under the RUS specification.

(3) RUS's letter acknowledging the plant's advance notice of intent to treat material for reserve treated stock for the calendar year in question shall be evidence of compliance with the notification requirements.

(4) Producers shall notify RUS of:

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(i) The locations of all storage or distribution yards where reserve treated stock will be maintained;

(ii) The designation of the RUS-approved plan;

(iii) The name of the selected inspection agency, where applicable; and

(iv) Any changes that occur during the year.

(5) Crossarms treated with oil-borne preservatives which have been held in storage for more than 1 year before shipment to the borrower, shall be reassayed before shipment and shall be re-treated if found nonconforming for retention on orders placed in accordance with this section.

(6) The crossarms shall meet the assay after re-treatment in accordance with paragraph (k) of this section.

(7) Crossarms which are held in storage after final acceptance shall be stacked in piles or on skids in such a manner as to assure good ventilation. The stacks shall be covered or stored indoors for protection from the sun and weather to reduce checking, bending, and loss of preservative.

(8) Borrowers or their contractors shall not purchase reserve treated stock from plants that fail to comply with the notification requirements.

(n) Drawings. (1) The drawings of Exhibit B of this section, Crossarm Drilling Guide, have a type number and show in detail the hole size, shape, and pattern desired for crossarms ordered under this specification.

(2) Purchase orders shall indicate the type required.

(3) Crossarms shall be furnished in accordance with the details of these drawings or in accordance with drawings attached to the purchase order

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(4) Technical drawings for transmission crossarms are published in RUS Bulletin 1728F-T805B (formerly 50 - 1), Electric Transmission Specifications and Drawings, 115kV through 230kV, and RUS Bulletin 1728F-T805A (formerly 50 - 2), Electric Transmission Specification and Drawings, 34.5kV through 69kV.

(5) Appropriate drawings for transmission arms are to be specified and included with purchase orders.

(o) Destination inspection. (1) When cross-sectional tolerances are measured at destination, average shrinkage allowance shall be considered using the arm's current moisture content and actual size.

(2) Using the average shrinkage allowances for Douglas-fir and Southern Yellow Pine as 1 percent size change for each four point moisture content change below the fiber saturation point, calculations can be made to determine if the arm met the minimum size at time of manufacture, when the arm was to meet the average moisture content.

Exhibit A to §1728.201 -- Distribution and Transmission Arms

(Illustration available on hard copy only)

Exhibit B to §1728.201 -- Crossarm Drilling Guide

(Illustration available on hard copy only)

[58 FR 41396, Aug. 3, 1993]

**§1728.202 RUS Bulletin 1728H-702, RUS Specification for Quality Control and Inspection of Timber Products.**

(a) Scope. This specification describes in more detail the responsibilities and procedures pertaining to quality control for crossarms, as specified in §1728.201 of this part, and poles,

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covered in RUS Bulletin 1728F-700, incorporated by reference in §1728.97 of this part and in §1755.97 of 7 CFR part 1755.

(b) Related specifications and standards incorporated by reference.

The following specifications and standards referenced throughout this section are incorporated by reference. This incorporation by reference is approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of each are available for inspection during normal business hours at RUS, room 1250-S, U.S. Department of Agriculture, Washington, DC 20250 or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC. Copies of these standards and specifications may be purchased from the addresses shown below.

(1) American Wood-Preservers' Association (AWPA), Book of Standards, 1991 edition, available from AWPA, P.O. Box 286, Woodstock, Maryland 21163 - 0286.

(i) A1 - 91, Standard for Coal Tar Creosote for Land and Fresh Water Use.

(ii) A2 - 91, Standard Methods for Analysis of Waterborne Preservatives and Fire-Retardant Formulations.

(iii) A3 - 91, Standard Methods for Determining Penetration of Preservatives and Fire Retardants.

(iv) A5 - 91, Standard Methods for Analysis of Oil-Borne Preservatives.

(v) A6 - 89, Method for the Determination of Water and Oil-Type Preservatives in Wood.

(vi) A7 - 75, Wet ashing Procedure for Preparing Wood for Chemical Analysis.

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(vii) A9 - 90, Standard Method for Analysis of Treated Wood and Treating Solutions by X-Ray Emission Spectroscopy.

(viii) A11 - 83, Analysis of Treated Wood and Treating Solutions by Atomic Absorption Spectroscopy.

(ix) C1 - 91, Standard for Preservative Treatment by Pressure Processes All Timber Products.

(x) C4 - 91, Standard for the Preservative Treatment of Poles by Pressure Processes.

(xi) C8 - 91, Standard for the Full-Length Thermal Process Treatment of Western Red Cedar Poles.

(xii) C10 - 91, Lodgepole Pine Poles -- Preservative Treatment by the Full-Length Thermal Process.

(xiii) C12 - 90, Western Larch Poles -- Full-Length preservative Treatment by Thermal Process.

(xiv) M1 - 90, Standard for the Purchase and Preservation of Forest Products.

(xv) M2 - 91, Standard Instructions for the Inspection of Preservative Treatment of Wood.

(xvi) M3 - 81, Standard Quality Control Procedures for Wood Preserving Plants.

(xvii) M4 - 91, Standard for the Care of Preservative-Treated Wood Products.

(xviii) P1/P13 - 91, Standard for Coal Tar Creosote for Land and, Fresh Water and Marine (Coastal Water Use).

(xix) P5 - 91, Standards for Water-Borne Preservatives.

(xx) P8 - 91, Standards for Oil-Borne Preservatives.

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(xxi) P9 - 91, Standards for Solvents for Organic Preservative Systems.

(2) American Institute of Timber Construction (AITC) 200 - 83, Inspection Manual, 1987 edition, available from AITC, 333 West Hampden Avenue, Englewood, Colorado 80110.

(3) American National Standards Institute (ANSI) 05.2 - 1983, American National Standard for Wood Products -- Structural Glued Laminated Timber for Utility Structures, available from ANSI, 1430 Broadway, New York, New York 10018.

(4) American National Standards Institute/American Institute of Timber Construction (ANSI/AITC) A190.1 - 1983, American National Standard for Wood Products -- Structural Glued Laminated Timber, available from ANSI, 1430 Broadway, New York, New York 10018.

(5) American Society for Testing and Materials (ASTM) D9 - 87 (1992), Standard Terminology Relating to Wood, available from ASTM, 1916 Race Street, Philadelphia, Pennsylvania 19103 - 1187, telephone number (215) 299 - 5585.

(c) General stipulations. (1) Each RUS electric borrower shall submit to the Director, Electric Staff Division, Rural Utilities Service, room 1250-S, 14th and Independence Avenue, SW., Washington, DC 20250 - 1500, in January of each year a list of plants from which it obtained poles or crossarms during the preceding calendar year.

(2) Ultimate quality control is the responsibility of the producer's management; however, a member of the producer's staff shall be designated quality control designee and charged with the responsibility for the exercise of proper quality control procedures. The requirements in American Wood Preservers' Association (AWPA) Standard M3, covering records, adequate laboratory, plant gauges, and other plant facilities including proper storage, shall be followed.

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(3) The methods of inspection described in this section shall be used no matter which plan timber products are purchased under, i.e., Insured Warranty Plan, Independent Inspection Plan, or Quality Assurance Plans as described in §1728.201 of this part or RUS Bulletin 1728F-700. The number of poles and crossarms actually inspected by monitors for quality control under a Quality Assurance Plan or the Insured Warranty Plan may vary from the number of poles and crossarms inspected under the Independent Inspection Plan. Under the Independent Inspection Plan, each pole and a sample number of crossarms shall be inspected.

(4) Under the Independent Inspection Plan, the RUS borrower should designate in the purchase order which inspection agency it has selected. Unless the RUS borrower contracts for inspection as a separate transaction, the treating company shall obtain the services of the RUS borrower's designated inspection agency. For reserve treated stock for purchase under the Independent Inspection Plan, the treating company shall obtain the services of an inspection agency. Selection of and changes in inspection agencies for reserve treated stock shall be promptly reported to the Director, Electric Staff Division, Rural Utilities Service, Washington, DC 20250 - 1500, in accordance with RUS Bulletin 1728F-700, and §1728.201.

(5) Individual inspectors in the employ of Independent Inspection Agencies shall be experienced and competent. The inspector shall perform all phases of the inspection personally and in the proper sequence. The primary responsibility of the inspector is to determine, for the borrower, by careful inspection and verification, that the timber products, preservative, and treatment meet the requirements of RUS Bulletin 1728F-700 and Bulletin 1728H-701 and that the methods, storage facilities, and production equipment conform to applicable RUS specifications. For details of the recommended inspector's qualifications see Appendix A of this section.

(6) Laminated materials for use on RUS borrower systems shall follow manufacturing and quality control requirements as

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specified in ANSI 05.2 -- 1983, American National Standard for Wood Products -- Structural Glued Laminated Timber for Utility Structures, and ANSI/AITC A190.1 - 1983, American National Standard for Wood Products -- Structural Glued Laminated Timber. The product shall be marked and certified.

(i) Laminated material shall be inspected by a qualified inspection and testing agency.

(ii) Quality control of material shall be performed to determine conformance with §1728.201 of this part and AITC 200 - 83, Inspection Manual.

(d) Quality control and inspection procedures for product acceptance. It is the responsibility of the plant quality control designee to perform the following procedures to insure that a particular lot of material conforms to the requirements of the applicable RUS specification prior to treatment. After the plant quality control designee has performed these procedures, a particular lot of material shall be released to the inspector for verification of conformance.

(1) Poles can be purchased under any of the three purchase plans. These plans are Insured Warranty Plan, Independent Inspection Plan, or a Quality Assurance Plan. Under the Independent Inspection Plan, all poles in a lot shall be inspected. Under the Insured Warranty Plan and a Quality Assurance Plan, the number of poles in a lot actually inspected may be less than every pole, depending on the terms of the plans.

(i) Ample space and assistance shall be provided by the treating plant for handling and turning to insure that the surfaces of all items can be adequately inspected.

(ii) Under the Independent Inspection Plan, all poles shall be inspected for conformance to the requirements of RUS Bulletin 1728F-700. If a pole is rejected and the cause of rejection is corrected, the rejected pole may be offered again for inspection as new material.

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(iii) Dimensions, length, and circumference shall be measured by a standard steel pole tape to determine that they are in agreement with the details for class and length in the brand and butt stamp. If it is obvious by visual comparison with a measured pole that the brand information is correct, individual poles need not be measured. Pole circumference dimensions made prior to treatment shall govern acceptance. Reduction in dimension due to treatment and shipping shall be not more than 2 percent below the minimum for the pole class.

(iv) If 15 percent of the poles in a lot offered for inspection are defective, the inspector shall terminate the inspection. Re-examination of an entire lot by plant quality control shall be required when the number of rejected poles equals or exceeds 15 percent of the lot inspected. All defective or nonconforming poles either shall be removed from the lot or marked out.

(v) Poles in a lot inspected for decay shall be of the same seasoning condition. If the independent inspector suspects that decay has occurred, he shall cut a slice from both ends for closer examination. If 5 percent of the inspected poles in a lot shows evidence of decay, the entire lot shall be unconditionally rejected without further sorting.

(vi) Moisture content, when limited by the purchaser, as stated on the borrower's purchase order, shall be measured by calibrated electric moisture meter. Calibration of the meter shall include not only the zero settings for the X and Y readings, but also two resistance standards for 12 and 22 percent moisture content.

(vii) Material failing to conform for moisture content may be retested upon request after a recalibration of the instrument. The results of the second test shall govern disposition of the lot.

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(viii) Re-examination for any mechanical damage or deterioration and for original acceptance shall be conducted on timber products not treated within 10 days after original inspection.

(2) Crossarms can be purchased only under either of two purchase plans. These plans are the Independent Inspection Plan or Quality Assurance Plans. Under the Independent Inspection Plan, crossarms are to be inspected prior to manufacture, during manufacture, and after treatment. Under a Quality Assurance Plan, crossarms are monitored according to the terms of the quality assurance program acceptable to RUS.

(i) Inspection prior to treatment shall include:

(A) Surface inspection of all ends of all arms. This is usually done on the stacks of arms prior to manufacture. Particular attention shall be paid to defects commonly found in the ends, such as compression wood, red heart and other forms of decay, shakes, splits, through checks, scantiness, honeycomb, and low density, determined by rings per inch (centimeter) and percent of summerwood. Whenever the number of nonconforming arms is found to exceed 0.5 percent of the lot or one arm, whichever is greater, the entire lot shall be rejected for excess number of defective ends. After the producer has removed or marked out the defective material, the arms may be resubmitted for inspection.

(B) Surface inspection of the lengthwise sides performed on a random representative sample. The sample size shall equal 20 percent of a lot size or 200 arms, whichever is smaller. The inspector shall examine side surfaces as they are slowly rotated. When necessary, the rotation may be stopped for closer inspection. Whenever the number of nonconforming arms is found to exceed 2 percent of the sample size, the entire lot shall be rejected. After the producer has removed or marked out the defective material, the arms may be resubmitted for inspection.

(C) Check of moisture content of the random sample by a calibrated moisture meter.

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(D) Check of crossarm dimensions of the random sample measured after surfacing.

(ii) Inspection during manufacture shall consist of:

(A) Checking bolt and insulator pin holes for squareness and excessive splintering;

(B) Checking brands for completeness, location, and legibility; and

(C) Checking arms for conformance.

(iii) Under the Independent Inspection Plan, there shall be a final inspection during and after treatment for preservative retention and penetration and for damage.

(3) Structural glued laminated timber shall be tested and inspected in accordance with AITC 200 - 83, Inspection Manual. Grade of lumber shall be inspected by a qualified grader for specified quality, and so marked, in accordance with grading rules of the American Lumber Standards. Adhesives used for all structural arms shall meet requirements of ANSI 05.2 - 83, paragraph 5.2. Melamine urea adhesives shall not be used. End joint spacings and limitations shall be in accordance with ANSI 05.2 - 83.

(e) Preservatives. (1) Creosote shall conform to the requirements of AWP Standard P1 when analyzed by AWP Standard A1, sections 2, 3, 4, either 5 or 9, and 6.

(i) Each occasional charge, all material treated in a cylinder at one time, shall be analyzed.

(ii) The first charge and one of every five charges randomly selected in consecutive charges shall be analyzed.

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(2) Solutions of waterborne preservatives shall be analyzed for components in accordance with AWWA Standards A2, A9, or A11, and shall meet the requirements of P5 for composition. AWWA A2 shall be used as a referee method.

(3) Pentachlorophenol shall contain not less than 95 percent chlorinated phenols and conform to AWWA Standard P8 in hydrocarbon solvent AWWA P9 Type A.

(4) Copper Naphthenate in hydrocarbon solvent (AWWA P9 Type A) shall contain not less than 6 percent nor more than 8 percent copper in the form of Copper Naphthenate and conform to AWWA Standard P8 when analyzed in accordance with AWWA Standard A5.

(f) Plant facilities and inspection during treatment. (1) Manufacturing and treating plant facilities shall conform to AWWA Standard M3, paragraph 3. Pressure plants shall be equipped with recording instruments to register time, pressure, temperature and vacuum during each cycle of treatment. They shall also be equipped with indicating thermometers and pressure and vacuum gauges to check the accuracy of the recorders. Work tanks shall be equipped with a thermometer. Thermal treating vats shall be equipped with a time and temperature recorder and with an indicating thermometer. Temperature recording devices are not mandatory for plants treating exclusively with waterborne preservatives.

(2) Under the Independent Inspection Plan, the inspector shall be present during the treatment procedure, except at times when it may be impractical, such as during late night or early morning treatments. At such times, temperature, pressure, and vacuum data shall be taken from the recording charts.

(3) Recording instruments shall be checked with indicating gauges and thermometers. Inaccuracies shall be referred to the treating company for prompt correction. In the event of an inaccuracy, indicating possible damage to the material, the inspector shall reject the charge.

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(g) Results of treatment. (1) Poles shall be tested for retention and penetration by means of a calibrated increment borer 0.2 inches (0.51 cm) 1B 0.02 inches (0.05 cm) in diameter in accordance with procedures in AWP Standard M2, paragraph 5.22. Under the Independent Inspection Plan, all treating charges shall be tested for retention and penetration. Plant quality control and independent inspection shall do their analyses separately. Under the Insured Warranty Plan and Quality Assurance Plans, the frequency of testing retention and penetration may vary according to the plan.

(i) Western red and northern white cedars and western larch poles shall be bored at any point of the periphery approximately 6 - 12 inches (15.24 - 30.48 cm) above ground line and all other species approximately 1 foot (30.48 cm) above or below the brand.

(ii) Penetration shall be determined in accordance with AWP Standard A3. Chrome Azurol S and Penta-Check shall be used to determine penetration of copper containing preservatives and penta, respectively.

(iii) Retention sampling.

(A) When there are 20 or more poles in the treating charge, the retention sample for creosote shall consist of 20 assay zones from southern pine and Douglas-fir poles. All poles in charges with fewer than 20 poles shall be bored once. Charges with less than 15 poles shall be bored once and bored again on a random basis to obtain a minimum of 15 assay zones.

(B) Retention samples shall be taken from 20 poles in charges of 20 or more poles.

(C) Retention samples for Alaska yellow, western red, and northern white cedars shall be comprised of a minimum of 30 assay zones for creosote and waterborne preservatives. For penta

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charges of fewer than 30 poles, the sample shall contain the assay zone from each pole in the lot.

(D) Retention samples shall be comprised of borings, representative of pole volumes for each class and length in the charge. Further selection and marking of poles of mixed seasoning, volume, and

(TABLE START)location on the tram shall be made as illustrated in the following table:

(Table available on hard copy only)

(iv) When material in a lot consists of fewer pieces than the designated minimum number of samples for assay, additional borings shall be taken so as to make up at least the minimum sample, and in such manner that the sample is representative of the lot of material with respect to any variations in size, seasoning condition, or other features that might affect the results of treatment.

(v) Analyses for preservative retention shall be performed.

(A) Creosote shall be analyzed by AWP Standard A6.

(B) Penta shall be analyzed by AWP Standard A5 or A9. Copper pyridine method is required when timber may have been in contact with salt water and for all species native to the Pacific coast region, unless the raw material invoice specifically states that the material either has not been in contact with salt water or has been shown by analysis to have contained no additional chlorides before treating.

(C) Copper Naphthenate shall be analyzed by tests in accordance with AWP Standards A5 or A9.

(D) Waterborne preservatives shall be analyzed by tests in accordance with AWP Standards A2, A7, A9, or A11.

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(E) Prior to unloading a tram, the inspectors may take their own samples and analyze them concurrently with the quality control designee, but each shall work independently, and quality control data shall be presented before acceptance of the charge.

(vi) Penetration sampling of poles.

(A) Group A poles consist of poles with a circumference of 37.5 inches (95.25 cm) or less at 6 feet (1.8 m) from butt.

(1) Bore 20 Group A poles or 20 percent of the poles, whichever is greater. Accept if 100 percent of the sample conform; otherwise, bore all poles.

(2) Re-treat the charge if more than 15 percent of the borings are found to be nonconforming.

(3) Re-treat all nonconforming poles if 15 percent or fewer fail the requirement.

(B) Group B poles consist of poles with circumference greater than 37.5 inches (95.25 cm) at 6 feet (1.8 m) from the butt.

(1) For Group B poles 50 feet (15.2 m) and shorter, bore each pole and re-treat only those found to be nonconforming, unless more than 15 percent fail; in that case, re-treat the entire lot.

(2) For Group B poles longer than 50 feet (15.2 m), bore each pole twice at 90 degrees apart around the pole and accept only those poles conforming to the penetration requirement in both borings. All nonconforming poles may be re-treated only twice.

(vii) All holes (nominal 0.2 of an inch (0.05 cm) diam. bit) shall be promptly filled with treated, tight-fitting wood plugs.

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(2) Under the Independent Inspection Plan, all treating charges of crossarms shall be tested for retention and penetration. Plant quality control inspectors and independent inspectors shall do their analyses independently. Under the Quality Assurance Plans, the frequency of testing retention and penetration may vary according to the plan.

(i) The penetration and retention sample shall consist of 20 (48 for creosote) outer 6/10 of an inch (1.52 cm) for Douglas-fir and 1 inch (2.54 cm) for Southern Yellow Pine zones from borings taken from any face except the top face at a location as close to the end as possible being at least 3 inches (7.62 cm) from the end of the arm and no closer than 3 inches from the edge of any holes. For laminated material, borings shall be taken from laminates on a random basis.

(ii) Penetration shall be tested by taking not less than 20 borings from 20 crossarms in each charge, determined in accordance with AWP Standard A3. Chrome Azurol S and Penta-Check shall be used to determine penetration of copper containing preservatives and penta, respectively.

(3) Laminated material shall be checked for any evidence of delamination due to treatment and for the identifying quality stamp of AITC or American Plywood Association (APA).

(4) When x-ray fluorescence (XRF) instruments are used to analyze preservative or retention, Periodic Instrument Checks (PIC) shall be made by the treating plant and any outside inspection agency using the treating plant's instrument or its own. Appendix B of this section outlines a recommended procedure.

(5) At a minimum, treating plants shall perform the PIC weekly and record the results in the instrument's log, which shall be stored with the instrument. Independent inspection agencies shall use their own samples to perform the PIC on treater's instrument once per visit, not to exceed one PIC per week. Inspection agencies shall record their results in the

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instrument's log and state the date of its latest PIC on all treating reports.

(6) XRF instruments shall be accurate and reliable, and they shall generate reproducible results. Instruments shall have thorough instructions which should include recommendations on drying techniques, equipment, and density calculations. These drying recommendations shall be followed when using these instruments.

(h) Product acceptance. Under the Independent Inspection Plan, the inspector shall signify acceptance by marking each piece of accepted material with a clear, legible hammer stamp in one end prior to treatment and in the other end after treatment. The inspector shall personally mark each piece, and shall not delegate this responsibility to another person.

(i) Charge inspection reports.

(1) Inspection Reports shall cover the following:

(i) The total pieces in the lot, number of and causes for rejection;

(ii) The conditioning of the material prior to treatment;

(iii) The analyses of preservative identified by the analyst's signature or certification;

(iv) The details of treatment; and

(v) The results of treatment. These results shall include the following:

(A) The depth of penetration for retention sample and a summary of all poles rejected for insufficient penetration;

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(B) Worksheets for retention analyses, each identified by quality control designee and independent inspector;

(C) The number of pieces offered and rejected, together with the cause(s) for rejection;

(D) The date of latest Periodic Instrument Check.

(2) On each inspection report the independent inspector and the plant quality control designee shall certify, in writing, that the material listed on the report has been inspected before, during, and after treatment, and that the preservative used was analyzed in accordance with the requirements of this section.

(3) Each inspector or inspection agency shall retain for a period of 1 year a copy or transcript of each report of inspection, together with laboratory worksheets covering retention by assay and preservative analyses for the purchaser, and on request shall furnish a copy or transcript of any of these reports to the Director, Electric Staff Division, Rural Utilities Service, Washington, DC 20250 - 1500.

(j) Charge numbers on re-treat poles. The letter ``R'' shall be added to the original charge number in the butts of all poles that are re-treated for insufficient penetration or retention of preservative. All poles that fail to meet treatment requirements after two re-treatments shall be permanently rejected.

(k) Safety provisions. Poles intended for RUS borrowers shall not be inspected when, in the opinion of the inspector, unsafe conditions are present.

#### Appendix A to §1728.202 -- Recommended Inspectors' Qualifications

(a) Inspection agencies should see that inspectors assigned to the inspection of timber products and treatment for RUS borrowers are competent and experienced.

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(b) Recommended experience. In general, any of the following examples are recommended as minimum qualifying experience before a new inspector may be permitted to inspect timber products for RUS borrowers:

(1) Three years' experience as an inspector of timber and the preservative treatment of timber.

(2) Three years' experience in timber treating plant quality control work.

(3) Under the direct supervision of an experienced, well-qualified inspector, who has performed the following:

(i) Inspected at least 2,500 poles and/or crossarms ``in the white.''

(ii) Checked preservative penetration results on at least 500 poles and crossarms.

(iii) Made at least 35 wood assays for preservative retention.

(iv) Made at least 25 analyses of each type preservative used on material the person is assigned to inspect.

(v) In both (b)(1) and (b)(2) of this Appendix A, the experience should be not less than that required in (b)(3)(i), (b)(3)(ii), (b)(3)(iii), and (b)(3)(iv).

(4) Inspectors experienced in the inspections of one product, such as poles, should not be qualified to inspect another product, such as crossarms, until the above experience is gained.

(5) The inspector should be especially well informed in wood preservation and the operation of a timber treating plant, and be competent in preservative analysis and other laboratory work.

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(6) In all cases, an inspector should be thoroughly instructed in the application of RUS specifications and the standards pertaining thereto before being permitted to independently inspect timber products and the treatments applied to them. Knowledge of these specifications and standards, as well as the inspector's proficiency, may be checked routinely by members of the RUS staff.

Appendix B to §1728.202 -- Periodic Instrument Check X-ray Fluorescence

(a) General. The following sample calibration standards and procedures may be used in lieu of comparison with analysis by wet ash or lime ignition methods.

(b) Penta. Until such time as AWPAs approves calibration standards for penta, the following method should be used to run a salt water solution to measure Cl (chloride).

(1) Standard Solution. Dry approximately 15 grams of reagent grade NaCl at 105-C for 1 hour. Weigh 10.00 grams into a tared beaker. Add distilled water until the total weight is 100.00 grams. Stir until completely dissolved. This will give a 10 percent weight to weight solution of NaCl.

(2) Baseline Check. (i) Insure that the instrument is in good agreement with lime ignition.

(ii) Record any user correction factors.

(iii) Stabilize and standardize the instrument.

(iv) Run the salt solution five times using the PENTA-OIL calibration mode.

(v) Record the average and standard deviation of the values for percent penta. The average value will now be considered the nominal value.

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(3) Periodic Instrument Check. Run the salt solution two times and average the results. If the value is more than 1B 5 percent of the nominal value, the instrument needs further calibration, following manufacturer's recommendation.

(c) Waterborne preservatives. Treaters and inspection agencies should purchase AWPAC Committee P-5 Standard Reference Materials to analyze on their instruments. Reference materials should be in the retention range of the material being produced at the plants. If the value is more than 1B 5 percent of the nominal value, the instrument needs further calibration. AWPAC Committee P-5 Standard Reference Materials may be purchased from:

American Wood Preservers' Association, P.O. Box 286,  
Woodstock, Maryland 21163, Phone: (410) 456 - 3169.

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