§ 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, 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 National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* 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.

(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.

(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.

(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 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.

(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.

(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.

(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 AWPA Standard P1 when analyzed by AWPA 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.

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

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

(4) Copper Naphthenate in hydrocarbon solvent (AWPA 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 AWPA Standard P8 when analyzed in accordance with AWPA Standard A5.

(f) *Plant facilities and inspection during treatment.* (1) Manufacturing and treating plant facilities shall conform to AWPA 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.

(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) ±0.02 inches (0.05 cm) in diameter in accordance with procedures in AWPA 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 AWPA 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 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 location on the tram shall be made as illustrated in the following table:

Number of Poles	Class/Length	Vol. in cu. ft.	Total Volume	Number of Borings
27	7/30(09.1 m)	232	15	3
26	4/35(10.7 m)	447	29	6
11	5/35(10.7 m)	163	10	2
55*	6/35(10.7 m)	704	46	9
Total		1,546		

*If a portion of these poles were green and some partially seasoned, then the number of borings should reflect the approximate percentage of each.

(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 AWPA Standard A6.

(B) Penta shall be analyzed by AWPA 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 AWPA Standards A5 or A9.

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

(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.

(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 AWPA 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 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;

(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 retreatments 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.

(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.

(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 AWPA 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.