TREATED WOOD IN THE YEAR 2000 A.D. - A user's perspective

by

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One of my responsibilities with Ontario Hydro is the role of Vice-Chairman of the Standing Panel of Wood Poles for both Distribution and Transmission use.

The Standing Panel is a group of representative user contacts and Research specialists from within Ontario Hydro. Their mandate is to introduce and maintain standards and specifications for wood poles, to review and determine the applicability of National Standards for the Corporation use and finally to evaluate suppliers and their products for acceptability for Ontario Hydro use. As the Vice-Chairman of this Panel I am responsible for recommending the selection of members for the panel, preparing terms of reference for the panel, recommending objectives, submitting new standard items to the panel for acceptance, receiving and resolving material complaints and finally ensuring corrective action has been completed to eliminate future non-conformancies.

Ontario Hydro has been and wishes to continue to be a user of treated wood products into the year 2000 A.D. As the largest distributor of electricity in the province of Ontario we have an inventory of over a million and a half treated poles which we must maintain and service. To ensure the reliability of our distribution system all poles must be treated with a preservative. Each year Ontario Hydro purchases between thirty and forty thousand treated poles both for new lines and for maintaining in service lines. Yearly replacement of rotted poles takes up to 6000 of this number. As you all know, the wood preservation industry is under attack for both environmental and human safety related concerns. The traditional wood preservatives, Creosote, Pentachlorophenol and Arsenate based waterborne treatments are all toxic chemicals with potential environmental and health related problems. Ontario Hydro wishes to work with the wood treaters to find a non-toxic treatment for wood poles which will provide at least thirty years protection.

In 1985 the Standing Panel through Material Complaints was made aware of health and safety concerns of both the public and of our own line men of so called Penta Bleeder

Poles. In some cases, new poles that were bleeding had to be changed out at a labour cost of over $ 2000 per pole because of complaints from the public. Bell Canada suggested to us that CCA-PEG was the best alternative to Penta treated poles. In 1986, we installed over one thousand CCA-PEG treated poles into our systems for evaluation. In the fall of 1987 the Ontario Ministry of Environment requested that Ontario Hydro stop the use of Penta treated poles. Ontario Hydro agreed to this request and will get out of Penta as soon as a reliable alternative to Penta treatment is available. At this time the Standing Panel on Wood Poles is not satisfied that an alternative treatment is available. Although CCA-PEG is available we have concerns because it is as toxic a chemical as Penta and the test data on the effects of PEG on CCA are incomplete. To us, CCA-PEG is only an interim solution. We are presently installing test poles treated with Copper Naphthenate in oil and also poles treated with Copper and Quaternary Ammonium for assessment of their attributes.

The Attributes we are considering are as follows in Table I:

TABLE I

1. The preservative has minimum Health and Safety effects to linemen and public.

2. The preservative does not reduce the mechanical strength of the pole.

3. The preservative does not increase the hardness of the wood thus reduce climbability.

4. The Service life of the pole is extended to a minimum of thirty years.

5. The preservative does not increase the electrical conductivity of the pole.

6. The preservative is not corrosive to galvanized steel or aluminum hardware.

7. The treated wood is not a restricted waste product which requires expensive disposal techniques.

8. The treated wood is cost effective compared to alternative poles either steel, wood composite, fibreglass and concrete.

9. The treatment is suitable for all species of pine.

Of course all of these attributes may not be attainable. Concessions on some may be necessary to achieve the best of all possible attributes.

Initial information indicates that the mechanical and electrical attributes are more easily attained with the use of oil borne treatments. The oil itself preserves the wood, reduces weathering and absorbtion of water. The water borne preservatives reduce mechanical and electrical attributes but they are cleaner and more retentive of treatment.

The Standing Panel on Wood Poles has decided that Ontario Hydro should continue to use clean Penta treated poles until a viable alternative is found. We will continue to emphasize to the treaters the need to provide clean, non bleeding poles. Inplant inspection by Ontario Hydro at the treaters and receiving inspection at Area yards will reject bleeding poles. Ontario Hydro will slowly expand its procurement of CCA-PEG treated poles to increase the supplier base. If a problem develops with CCA-PEG Treatment Ontario Hydro will not be totally dependent on CCA-PEG. We will continue to test alternative treatments to both Penta and CCA-PEG.

At this time Ontario Hydro through our representative on the Canadian Electrical Association Environmental Policy Committee are urging the Utilities to work together with Agriculture Canada to resolve the wood treatment problem. Canadian Utilities need to combine efforts to fund research and environmental accessments to find an acceptable pole treatment.

Setting the treatment aside for a moment Ontario Hydro have concern of the availability of trees for poles in Eastern Canada into the year 2000. Ontario, Quebec and many of the Central Eastern United States will have reduced stocks of suitable trees for poles because of the effects of acid rain pollutants. The great demand for housing construction is driving up the cost of wood poles and reducing the number of trees available for poles. Can the Treaters guarantee that trees will be available into the year 2000 because if they can't we must develop alternate materials now.

We are being constantly informed of new steels, high strength aluminum, fibreglass spun and concrete spun poles. Should we look at these alternative or will improved forest management make trees for poles more abundant in the future.

Ontario Hydro would like each Wood Treaters to implement Quality Assurance Program equivalent to CSA Z299.3. This Inspection Program would achieve process controls and planned inspection and all treaters could be evaluated equally. At present the treaters appear to be working at different levels of control. I am presently requesting inspection plans from our treaters. The plan includes physical requirements for poles to CSA 0.15, treating cycles, testing requirements to CSA 0.80 and final cleanliness inspection before release to Ontario Hydro. Good Process controls and planned inspection will reduce rejections at final inspection thus reducing cost to the Treater.

So inclusion Ontario Hydro for the next 10 years will:

1. Search for viable alternative treatments.

2. Investigate alternative materials for poles.

3. Increase the Quality requirements on Treaters in the hope of cleaning up Penta treatment.

Z299.3, Quality Assurance Program

This Standard requires suppliers to plan and establish a program for verifying the conformance of products or services throughout the process. The program is documented but in a limited manner.

This Standard is suitable for products or services requiring some complex processes. They may be high volume services or mass produced products. Failure in service could result in significant cost or some risk to health and safety, or both.

Benefits to Suppliers

Suppliers who have effectively implemented contractual Quality Assurance Programs are reaping substantial benefits. They consider costs due to quality in a positive way, that is, in the same light as design development or manufacturing improvement—in other words, as an investment. They have proven that a strong Quality Assurance Program can have a very positive financial impact on a business. The overall benefits include the following:

(a) Greater assurance that delivered products or services meet specified requirements. This reduces warranty costs but, more important, it means happier customers and ensures long term growth and prosperity.

(b) Lower production costs due to less rework, repair, replacement, reinspection, retesting, and disruptions.

(c) Better delivery dates. It is quicker to do things right the first time.

(d) Better productivity because the design and production processes have been planned and reviewed; processes are proven capable before start of production; there is less machine downtime because personnel, being properly trained and indoctrinated, know what to do, how to do it, and why.

Benefits to Customers

Customers who contractually specify an appropriate Quality Assurance Program Standard and who discharge all their accompanying responsibilities derive many benefits:

(a) greater assurance that products or services will be delivered on time, which means fewer costs resulting from late delivery dates, loss of production, delayed commissioning, etc;

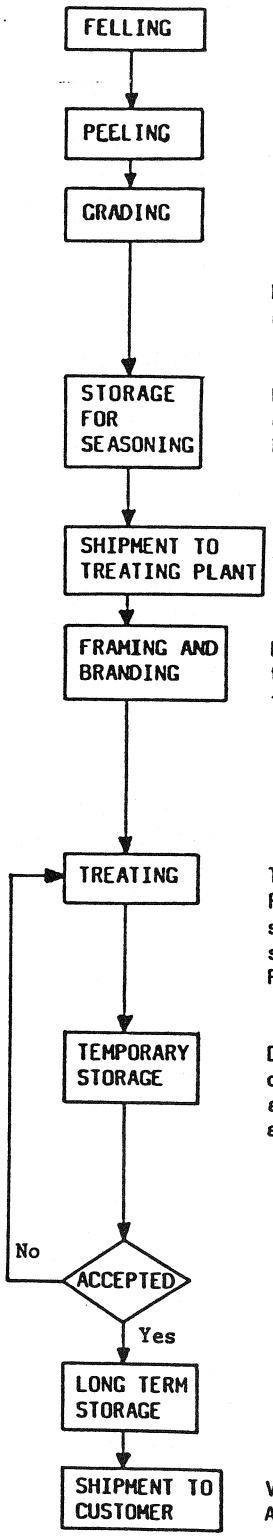
(b) greater assurance that delivered products or services meet specified requirements, with resulting gains in terms of economics and safety over the whole life of the products or services;

(c) reduced costs of necessary interventions during contract life to correct or obtain correction of arising problems;

(d) reduced costs of claims due to better communications and because possible ambiguities are more likely to be identified and resolved early in the process;

(e) reduced overall cost of products or services for their full life.

POLE PROCESSING AND INSPECTION FLOW SHEET



PROCESSING OPERATION	TYPE OF INSPECTION	INSPECTION PERFORMED AT	INSPECTION PROCEDURES
FELLING	Tree selection	Forest	Marking of candidate trees: size, straightness and limiting defects
PEELING			
GRADING	Establishment of pole size and class. Defect assessment.	Suppliers Yard	Pole size and class is determined from physical dimensions and visual assessment of defects, in accordance with CSA Standard O15.3 - 1960
STORAGE FOR SEASONING	Monitoring of seasoning Progress	Suppliers Yard	Determination of moisture content (thus, suitability for treating) by moisture meter, or oven-dry methods using core borings. Monitoring for stain and decay development.
SHIPMENT TO TREATING PLANT			
FRAMING AND BRANDING	Final inspection before treating	Treating Plant	Poles are assessed for size, class and moisture content to verify previous inspections. Poles are also assessed for damage and deterioration that may have occurred during handling, storage and transit. (Customer specs, CSA O15)
TREATING	Test of Preservative solution strength; Process control	Treating Plant	Samples of preservative solution are routinely drawn from the working tanks. Solution strength is determined as per AWPA Standards. Treatment parameters as per CSA O80
TEMPORARY STORAGE	Determination of retention and penetration, appearance	Treating Plant	Each charge of poles is assessed to determine that retention and penetration meet customer requirements. CSA and AWPA standard methods are used. A visual examination, for damage during treating and surface appearance, is performed at the same time.
ACCEPTED?			
LONG TERM STORAGE			
SHIPMENT TO CUSTOMER	Visual Assessment	Treating Plant	Poles are visually assessed, during loading out, for physical damage that may have occurred during storage and handling and for excessive bleeding.