WOOD POLE NEWSLETTER

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WESTERN WOOD POLES - MEETING SHORT AND LONG TERM DEMAND

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Recent research by Engineering Data Management Inc. concluded that for most overhead line applications, treated wood, compared to steel, fiberglass or concrete, remains the most cost-effective material in terms of initial costs as well as total life-cycle costs. [1] *Maintaining this position depends upon the pole industry's ability to continue to supply poles with historical strengths, meet short term emergency responses and to assure long term supply. The majority of the western pole industry, both white wood resource managers and finished product producers, were interviewed to evaluate these issues.*

Wood Pole Supply -Catastrophic Event Response

The ability of the wood pole industry to respond in a timely manner to catastrophic events, from hurricanes to ice storms, has been an area of concern. Industry has met the challenge. Consider the January, 1998 ice storm**,** the most severe ever recorded in the Canadian Province of Quebec and parts of the New England states. Utility structures, from the largest high voltage steel lattice towers to the smallest distribution lines, collapsed under the huge weights, placing an estimated 3,000,000 people in the dark without power.

Supplying the immediate need for 60,000[2] wood poles to repair the damage required the efforts of the entire wood pole industry all across North America. Western firms provided in excess of 32,000 poles - 3,600 transmission class and 28,500 distribution class, as well as 35,000 crossarms. Around the clock treating schedules and initial shipments began within hours of the event, from both plant sites several thousands of miles away as well as storage yards further east. In a single day more than 2,400 poles and 6,000 crossarms were shipped. The need to quickly move the large volumes of material, some of it over 100 feet in length, required a creative trucking industry. A Presidential executive order in the U.S. and action by government agencies in both countries, lifted the bureaucratic restraints of conflicting state and provincial load restrictions, speeding the response and quickening turnaround time.

Response to the storm was a cooperative effort between the pole suppliers and <u>all</u> the utility industry. To fill their needs, utilities had to be creative and flexible in terms of class and sizes,

as well as in waving unique specifications they might normally use. All across the U.S. and Canada, utilities willingly accepted delays in regular shipments so the emergency needs could be met.

The industry is justifiably proud of its success in responding to this crisis. The pipeline was certainly stressed - but even in light of the magnitude of this disaster, it did not break. A good supply of either treated or dry and ready to treat materials on hand at the plants, when coordinated with inventory in storage yards across both countries, allowed for an overnight mobilization to meet the challenge.

Wood Pole Supply -Meeting Regular Demand

One of the most difficult elements of the wood pole business is forecasting demand and developing inventory to meet customer needs for the coming year. Each treating plant will carry 3 to 4 months of finished inventory which may include up to one hundred different size-class of poles for each species they offer. There are a number of supply, cost and production factors that must be considered in establishing and balancing the inventory. The market needs must be projected based upon the best information from customers and industry data sources to determine which poles will be needed in the next year to 18 months. Timber sales and logging plans are laid out months, if not years in advance. To assure a proper mix of white wood each sale must be evaluated for pole materials to determine if pre-logging for removal of pole material needs to be incorporated and coordinated with other operations over the coming year. To air dry the material in preparation for treating requires from 9 months to over a year storage in the yard. Using kilns to shorten the seasoning cycle is effective but requires a major capital investment. Keeping the flows moving through the treating facilities necessitates balancing framing and treating for current orders with the need to build an inventory of finished products to meet urgent demands from the market. And of course, all this must be completed within the bounds of profitable company management.

Despite the difficulties, the industry is meeting the inventory and supply challenge. The interviewed firms all indicated that, over the last five years, they had never found it necessary to refuse to take or failed to fill an order from a regular customer and ship within the terms and conditions quoted. However, meeting demand for specific sizes becomes difficult when there is an acceleration of unpredicted repair or new line construction, especially when it involves large quantities of one or two size classes of poles. When a utility has its own unique standards for framing or treating, additional lead time may be required.

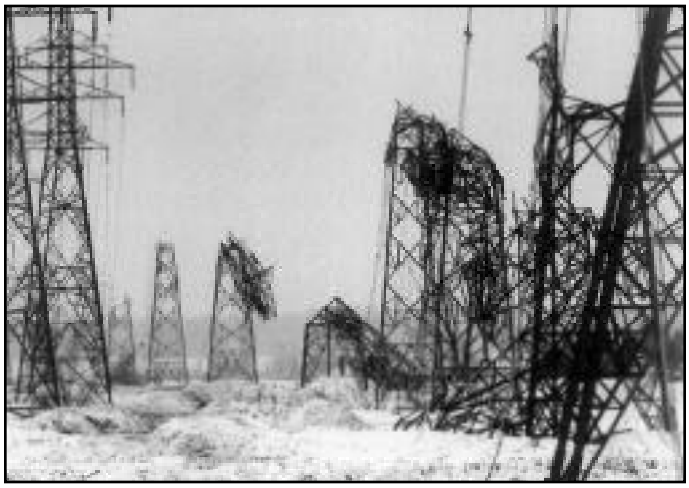
Information is the key.

The key to balancing inventory is **information, information and more information!** Better forecasting, based on better information from the utilities, allows the treating industry to assure the customer's needs are always met. Unfortunately, the uncertainty of deregulation can make it even more difficult to plan. On a brighter front, the increased use of *strategic alliances,* while far from being universally endorsed, do improve communications and greatly assist in planning for production levels and inventory. Bottom line, it is beneficial to both parties when utilities are able and willing to communicate their future plans, firm or not, to the treating industry.

Raw Material Supply

With the drastic changes in the management of our public forest resource in response to political and environmental pressures over the last decade, there is cause to be concerned about future timber supply. However, because of the importance of the product and the actual sources of pole material, the situation is not as serious as it might appear on the surface.

As recently as the early 1990's, lands managed by the U.S. Forest Service and Bureau of Land Management in the Pacific States produced a *sustained yield* in excess of 6 billion board feet of wood products each year. Following the Spotted



Owl debate, expansion of the Endangered Species listings and new directives from government, much of the land base which supported timber production has been removed and in turn timber harvest levels off of the federal lands has dropped by up to 90 percent.

While there have also been increased restrictions on State, Provincial and privately owned lands in the form of more restrictive forest practices laws, the basic purposes of the lands to be managed for timber has not changed. The resulting pressure on supply has encouraged higher timber prices, accelerated harvest levels, increased thinning and closer attention to utilization standards.

What does all this mean to wood pole supplies?

Federal timber on the western slopes of the Cascade Mountains, where the reductions have been greatest, has never been a major supplier of wood pole material. The WWPI survey indicates that prior to 1990 about 43 percent of the pole materials came from public land which includes State and Provincial lands which remain major suppliers. By 1998 this number had dropped to 35% reflecting the loss in federal land.

One area where federal land played a significant role was in supplying fine grained Douglas fir sawn material used in crossarm manufacture. While the federal supply has all but been eliminated, the producers have successfully switched to private and state timber sources. This is possible because the high value of crossarm material, up 70% over the last decade, encourages the remaining cutting mills to seek it out in sawing. Even before the increase in federal land restrictions, a very significant portion of the crossarm material was coming from second growth forests and these sources are meeting the demand for increased volumes of material meeting the standards.

The general view is that the effects of the decreased federal timber supply will have less of an impact on poles than many other forest products. The logic for this are several fold:

- The highly defective old growth timber stands, which were more prevalent on federal lands, have never been a major source of pole materials.
- Most poles come from maturing second growth (whether natural or man generated) stands which provide the straight, tall, sound and reasonably tapered timber needed. The vast privately held lands that were harvested in the late 1800's to the mid twentieth century now make up most of the harvest with age classes that produce the prime pole materials.
- Because of the relatively high value of trees as poles compared to use as saw logs or veneer peelers, sellers are increasingly interested in preserving these values. While a minor product in terms of volume, pre-logging a stand prior to final harvest is an increasingly used method to capture the high pole values.

While the overall impact of the change in federal policy and attitudes toward timber management is hardly a death blow to future wood pole supplies, it is not without possible consequences. Producers are confident that the high value of poles in relation to other uses will assure that demand will be met.

What About Fast Growth Poles from Managed Stands?

Concerned users, as well as wood detractors, present the concept that new poles grown in managed fast growth forests have less strength than traditional poles. These concerns are directed mostly at Douglas fir as Western Red Cedar is less frequently grown in intensive management programs where even aged regimes are utilized. For

a number of reasons, the concern over strength is not a realistic one.

- It is a false perception that naturally grown trees are all slow growing, tight ringed timber. In fact, nature produces a wide range of growth patterns and one could not determine by examining a single pole whether it was from a managed or natural forest stand.

- Concern that increased *juvenile growth* in fast growth stands adversely effects the product as a pole are completely without merit. *Juvenile growth* occurs in all trees until they are around 15 years old and thereafter adult growth is added to the outside of the tree. Since the critical strength for a pole comes from the outer 2-3 inches (a pole could be hollow and still perform just as well) the amount of juvenile wood at the pith of the trees is of no consequences.

- The ANSI standards have long recognized a relationship between growth rates and strength. ANSI Standard ***O5.1.4 Rate of Growth*** requires not less than six growth rings per inch in the outer 2 to 3 inches of the pole measured six feet from the butt. This rule has always protected the market from material that might be weaker than required. While managed stands may yield a more uniform product produced in fewer years, the strength requirements, as measured by the ring count, remain valid.

- In selecting seed trees for producing the planting stock for the intensively managed forests more than just fast growth is considered. One of the key characteristics the forest scientists look for in selecting the parent trees is the specific gravity of the wood, a direct measure of density and strength, which is achieved by more summer (dark rings) growth.[3] ANSI Standard ***O5.1.4 Rate of Growth*** recognizes this strength relationship by allowing an exception to allow: *Poles with 4 and 5 rings per inch are acceptable if 50% or more summerwood is present.*

- As we look more to intensively managed stands for our poles we can expect poles to be more uniform with a decrease in defects related to longer rotations such as knot size, defective butts, interior rots, stains and compression wood. We can also expect a somewhat thicker sapwood, an advantage for treating. The pole from the intensely managed forest of the future will be one which is genetically engineered to best meet the needs! Proper harvesting and an experienced manufacturing and treating industry will assure that the **poles reaching the market will meet the standards that have been the proven guide for so many decades.**

Conclusion

The wood pole has been at the heart of the North American electrical transmission and distribution system throughout the twentieth century. As the suppliers of the premier product, industry successfully met the needs of the growing economies and responded to nature's ravages time and again. From the wonders of a renewable resource, comes the assurance of a continued long term pole supply. In the new century, as the electrical infrastructures become more complex, the industry's customers can rest assured that there will be a continued and adequate supply of Douglas fir and Western Red Cedar utility poles with the same time proven high quality, strength and performance characteristics.

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[1] *Life Cycle Study Proves Wood is the Best Investment* Wood Pole Newsletter, Volume 23, Fall 1997, Western Wood Preservers Institute.

[2] Canadian Institute of Treated Wood - personal communication.

[3] Simpson Timber Company - personal communication.

DISPOSAL: THROUGH-BORED DOUGLAS-FIR MEETS THE TEST AS A NON -HAZARDOUS WASTE.

Through-boring of Douglas-fir poles is required by many utilities to increase the preservative penetration in the butt and/or top sections of their poles. The Bonneville Power Administration (BPA) has over 20,000 through-bored poles in service with *not a single failure recorded due to decay or breakage in the through-bored zones* . When removed from service most BPA poles go to the public for reuse in landscaping or other appropriate applications. Sections of the poles, however, are not always suitable for reuse and must be disposed by other means. The question arose as to if the greater amount of chemical used in through-bored pole sections would impact the non-hazardous waste classification of the poles when removed from service and intended for land fill disposal.

Through-bored poles pass TCLP evaluation as non-hazardous waste.

To address this question, BPA employees Jim Cahill and Mark Newbill conducted a small scale test of both Creosote and Penta poles. Using appropriate field and lab technologies, the poles were evaluated in terms of the Toxicity Characteristic Leaching Procedure (TCLP) analysis. TCLP levels are used by the EPA to define Hazardous Waste by establishing the threshold levels for the preservatives. The study concluded that, (as is the case with most treated wood products), *through-bored pole sections should be characterized as* ***non hazardous*** *solid-waste based on EPA standards for Penta and total cresols.*

The study evaluated cross sections from butt and top portions of the poles where through boring is used, as well as mid section where no through-boring is used. The results, compared to the EPA TCLP standards are show in the table.

TCLP RESULTS -Parts Per Million

Chemical	Butt Sample	Mid Sample	Top Sample	EPA Maximum
Penta	9.7 ppm	1.9 ppm	9.2 ppm	100.0 ppm
Total Cresols	10.4 ppm	4.0 ppm	7.5 ppm	200.0 ppm

The results of the test were comparable with other studies and showed the anticipated TCLP concentrations of Penta and Creosote will be *several order of magnitude below current EPA limits required for hazardous waste classification.* The authors guidance on the question: *Pole butts and tops cut from through bored poles are in compliance with all EPA regulations and should be accepted in standard landfill operations.* If you would like a copy of the study report or have other questions regarding disposal of treated wood please contact the Institute.

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