WESTERN RED CEDAR POLE ASSOCIATION
THE WORLD'S FINEST UTILITY POLES

Vol 23, Issue 1

Cedar Pole NEWS

BC Hydro: Using Cedar For 125 Years

BC Hydro, the third largest utility in Canada, services most of British Columbia and has 1.8 million customers spread over 854,000 sq. meters (330,000 sq. miles).

The utility has been using Western Red Cedar poles since 1883. Other wood species began being used in the 1950's. In 2007, a strategic sourcing committtee thoroughly examined BC Hydro's wood pole tendering and award process, as well as the philosophy behind species selection. After careful consideration of the many benefits related to cedar it was decided to return to cedar as the only wood species for poles purchased by the utility.

Poles used by BC Hydro are full-length treated with CCA. BC Hydro maintains 900,000 distribution poles, 100,000 transmission poles, and 300,000 other owner poles.

This 138 kV transmission line to Fort St. John has recently been extended north with 55 ft. to 80 ft.. cedar poles. Advance installation of steel culverts (shown in the inset) are used in rugged terrain to hasten pole line construction. The top of the culvert is covered, line crews then install the poles and backfill the culvert with rock.

BC Hydro Uses Cedar for Distribution and Transmission

BC Hydro operates 41 dam sites (75 dams), 31 hydroelectrical facilities and three natural thermal generating plants. Some 80% of the utilities' generation is produced by major hydro electric generating stations on the Columbia and Peace Rivers.

Fort St. John Substation

Located in central-eastern British Columbia on the Alaska Highway, the Fort St. John Substation serves the oil and gas industry loads as well as other development. It has now reached a firm capacity of 74.5VA.

Three long distribution feeders, which are heavily loaded, supply areas north, west and east of Fort St. John. These feeders are being replaced this year with a new 138kV transmission line running north about 60 km to the Fox Creek Substation, using cedar poles ranging in height from 55 ft. to 80 ft. This 138/25kV substation is located near a load center to alleviate long lines and correct reliability problems.

Burrard Thermal Generating Station

A thermal power plant, the Burrard Generating Station provides backup for the hydroelectric system during low water years, and provides transmission support and electrical supply security for the lower British Columbia mainland.

As energy available from BC Hydro dams becomes fully committed due to increased demand, Burrard will operate at greater capacity until new generating facilities are added to the system. As a system resource it also supports electricity trade from the BC Hydro integrated system.

Improvements at the Burrard Station include reduction of smog-forming pollutants by 90%, monitoring air polluting emissions on a continuous basis, elimination of chlorine from the cooling water, improved thermal efficiency, reduction of greenhouse gases, oil spill containment, and noise reduction at the facility. The generated power is delivered to the BC Hydro grid over 138kV lines.

BC Hydro Generation

BC Hydro, a crown corporation, generates between 43,000 and 54,000 gigawatt hours of electricity annually, depending on water levels. The utilities' primary business is the generation and distribution of electricity, and employs 5,200 people. Transmission of electricity is facilitated by BC Transmission Corp., a separate crown corporation, on behalf of BC Hydro and other power providers in British Columbia.

The BC Hydro grid is an integrated system that is able to offer some of the lowest electrical rates in North America.

These recently constructed 138kV double transmission lines use 65 ft. cedar poles and transmit power from Abbotsford to Mission, BC.

Below, several Western Red Cedar lines leave the Burrard Station. The H-frames use 75 ft. poles, and the other poles are 50 ft. to 65 ft.

Estimated Service Life of Wood Poles

A reprint of the second half of the North American Wood Pole Council Technical Bulletin, prepared by Jeffrey J. Morrell, Department of Wood Science & Engineering, Oregon State University. For the entire technical bulletin, and more information about wood poles the reader can access www.woodpoles.org.

Discussion Continued

The environment to which a pole is exposed can have a major effect on service life. On a national scale, the AWPA Standards divide the country into 5 difference decay zones (see Figure 1), with Zone 1 having the lowest risk of decay and Zone 5 the highest. Clearly, a pole treated to similar levels will perform better in a given Zone, but the AWPA Standards address this issue by providing several retentions that can be specified for a given chemical. The assumption is that poles exposed to a higher decay hazard will be treated to higher chemical loadings.

Maintenance can also be a major factor in pole service life. The National Electrical Safety Code mandates that utilities maintain their wood poles so that they retain 2/3 of their original required design strength. In order to meet this requirement, utilities must establish some regular program of inspection and maintenance. Most utilities inspect their poles on a 10 year cycle, using instrusive procedues that include boring into the pole at or below groundline and, for some species, excavating around the pole and examining the surface for external decay. There is compelling evidence to show that these procedures, coupled with application of remedial treatments and the use of reinforcements, markedly extend pole service life.

So, how can we estimate pole service life across the United States? Pole purchases vs total poles in service can be used to estimate overall replacement rates. In a survey of 261 utilities across the United States that owned over 42 million poles, utilities reported purchasing approximately 252,000 poles of various species per year. This figure represented all purchases including those for upgrades, accident poles and poles failing due to deterioration. This represents a 0.6% annual replacement rate. A similar 2006 survey of utilities in the Pacific Northwest found similar results and further segregated the causes for replacement (see Figure 2). In this case, the survey revealed a slightly higher replacement rate (0.8% vs 0.6% in the larger survey). Over half of the poles removed from service (56%) were decayed; however, poles removed for road widening or upgrades represented 38.1% of poles removed from service. While some of these poles might have had reduced capacity, they had not deteriorated to the point where their condition necessitated replacement. This means that over a third of the poles removed from service were candidates for reuse and, if these poles could be reused, they would further reduce the replacement rate to 0.5% per year.

If we use this replacement rate, the average pole service life would easily reach 80 years in may areas of the country, far in excess of the perceived 30 to 40 years. Thus, old wood does not mean weaker wood. While service life will vary among utilities, if we look in most utility systems, we see enormous quantities of lines installed in the 1950's where the vast majority of the poles remain in service. It is also important to remember that like most materials used by utilities, wood pole quality has improved. Over the intervening 50 years since the U.S. expanded the electrical grid, the AWPA specifications have shifted from gauge to results type treatments which means that actual chemical content in the wood is assayed. In addition, most utilities now inspect every pole, ensuring that all poles installed in a

(continued on page 4)

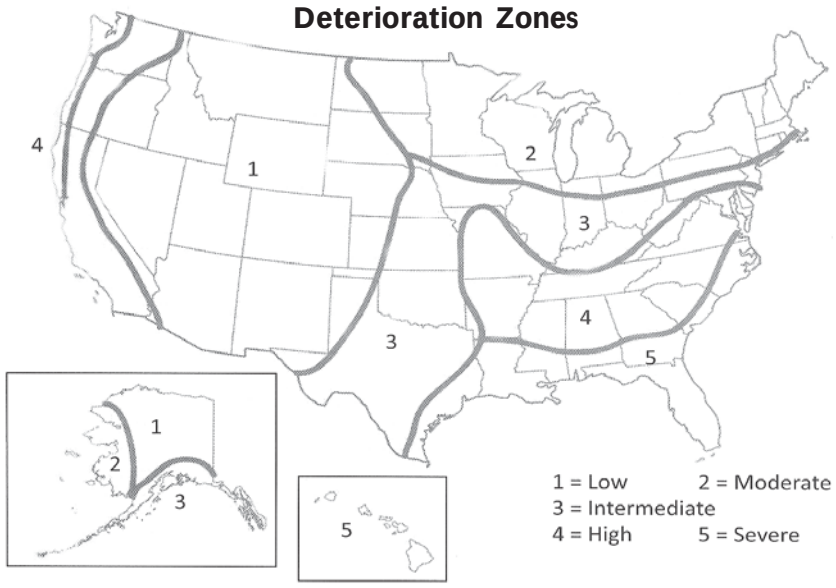

Figure 1. Map showing the decay hazard zones for the United States where 1 is a low hazard and 5 is a severe decay hazard (courtesy American Wood Protection Association). In certain modified environments such as banks along irrigation canals or irrigated residential or agricultural lands, a higher degree of protection might be needed than would be required in the local natural environment. It must also be recognized that within individual regions, certain natural environments such as river valleys or coastlines may present greater potential for wood deterioration than the region as a whole.

Cedar Pole NEWS

2405-61st Ave. S.E., Mercer Island, WA 98040
800-410-1917, 206-275-4753, Fax: 206-275-4755
email: info@wrcpa.org

PRSRT STD
U.S. POSTAGE
PAID
PERMIT #315
SEATTLE, WA

Estimated Service Life of Wood Poles

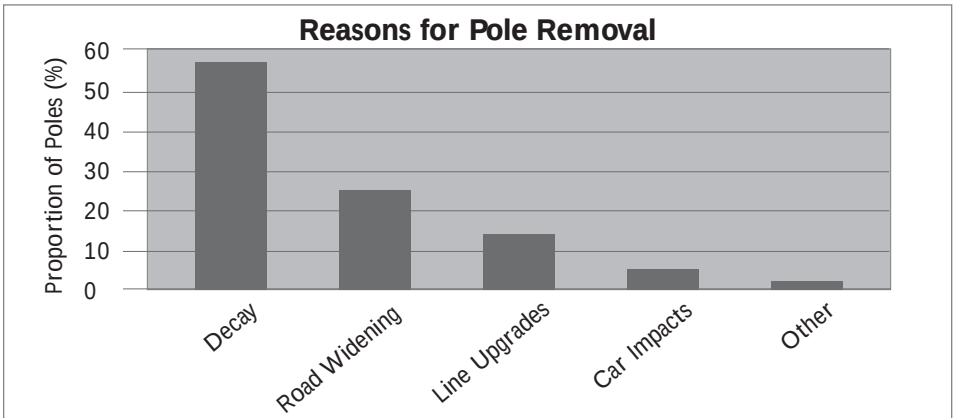

Figure 2. Causes for rejection of poles removed from service in the Pacific Northwest (based upon 52.375 poles).

system are properly treated. Finally, the development of effective maintenance programs further extends the life of the pole. All of these actions have resulted in wood poles that will perform more reliably for longer than ever before.

Epilogue

Wood poles already have substantial advantages over other materials because wood is renewable, sustainable, generates less greenhouse gases during manufacture, and provides a long-term repository for atmospheric carbon. Prolonging the useful life of a wood pole further enhances the carbon footprint through requiring less replacement activities, keeping thousands of tons of carbon stored in the existing pole plant (i.e. utility distribution and transmission system) and allowing growing replacements to continue carbon sequestration in the forest. Thus, wood poles offer utilities some attractive options as companies move to do their part with regard to global climate change.

The next time you are asked how long a pole will last, remember that the answer is as long as you want it and far longer than you ever thought.

Did You Know?

One large, healthy tree can:

- absorb as many as 7,000 dust particles per litre of air.

- absorb 75% of the CO_2 produced by the average car

-provide a day's oxygen for up to four people.

***Cedar Pole News* is a publication of the Western Red Cedar Pole Association, which is solely responsible for its content.**

The Western Red Cedar Pole Association can be reached at 800-410-1917, and at www.wrcpa.org.

Printed in the U.S.A. on recycled paper.