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

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Cedar Pole NEWS

Largest Montana Coop Uses Cedar Poles for 70 Years

Flathead Electric Coop was established in 1938 to bring electrical service to 117 rural homes and farms in western Montana. Today, this locally owned operation, named for Flathead Lake and headquartered in Kalispell, MT, is the largest cooperative in Montana.

The oldest cedar poles in the system are 70 years old, dating from the year prior to the founding of Flathead Electric.

The utility's service area extends 90 miles west and 60 miles east of the Continent Divide, and 15 miles north and 35 miles south of Kalispell..

With 80,000 poles in service, Flathead Electric Coop uses Class 5 and 6 cedar poles for distribution lines and up to 85 ft. H1 and H2 cedar poles for transmission lines.

The utility has 3,962 miles of lines, and last year 97 miles of lines were added to their system. Distribution lines carry 7.2kV and 14.4kV, and the transmission system is 34.5kV. Within two years Flathead Electric expects to have converted half of their transmission lines to 69kV. All of the utility's power is supplied by Bonneville Power.

Residential customers account for 67% of use, commercial for 13%, and industrial for 20%.

The utility has 62,000 meters, and began installing automated meters 12 years ago. By the end of the year all meters will be automated and provide improved information and service.

Flathead Electric has a net-metering policy that allows members to install renewable electric generation projects that reduce the member's energy costs and add energy to Flathead Electric's electric distribution system.

The renewable fuel resources include solar, wind, hydropower, and biomass. Any surplus energy generated by a

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A typical Flathead Electric line, this line carries 34.5kV transmission at the top, 17.2kV distribution in the middle and cable below. A recently rebuilt line, these cedar poles are 55 ft. Class 1, full-length, penta treated.

Glacier Electric Coop Designs High Wind Storm Resistant Lines

Glacier Electric Coop is located in Cut Bank, MT, in northwest area of the state where the U.S. and Canadian border crosses the Rocky Mountains.

Established in 1945 in Glacier County, where the prairies meet the mountains, there are challenging conditions for both power lines and railroads. The geology of the area causes sustained high winds in some locations where the wind blows in excess of 100 mph.

Glacier Electric uses side storm guy wires to assist poles from "walking out of the ground" due to the high winds. The pole foot mechanism placed at the bottom of the pole is the main device to keep the pole from "walking out." The guy wire is a storm guy to keep the structure from leaning and reaching the "bending/breaking" moment during the high cross winds that come directly off the mountain front ont he east side of Glacier National Park

These winds have been strong enough to derail both freight and passenger railcars, sometimes resulting in serious injury. The railroad has since constructed wind fences on the sides of railway tressels in high wind areas to prevent this occurrence.

Glacier Electric's service area extends from the Canadian border 75 miles south to the Marias River, and from the Continental Divide east about 120 miles.

The utility which has 1,847 miles of electrical line has used Western Red Cedar since the coop was founded, and went to total use of cedar in the 1990's. Durability and climbability are the key features why Glacier Electric chooses cedar poles for its system.

Transmission lines are 115kV, sub-transmission is 34.5kV, and poles are up to 90 ft. tall. Distribution poles are 35 ft.

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Sustained high winds in the Glacier Electric system can cause vibration that "walks" a pole structure out of the ground. The utility solved this potential problem by guying H-frame structures at right angles to the line direction. The cedar poles in this line are 70 ft. Class 2.

Flathead Electric -- 70 Yrs of Cedar

member's system goes back to the utility electric system and allows the member to receive credit for the electricity put back on the system at retail rates.

Flathead Electric contracts maintenance with independent firms which perform testing and remedial treatments. Poles taken out of service are often recycled by ranchers who use them for pole barns.

This 45 ft. cedar distribution pole carries 14.4kV power into the Rocky Mountains along Hwy 2.

This a typical 35 ft. Class 5 cedar distribution pole used in the Flathead Electric system.

The Hardening of Utility Lines -- Implications for Utility Poles Design and Use

A reprint of the second portion of the North American Wood Pole Council Technical Bulletin VII, this publication was prepared by Martin Rollins, PE. For the entire technical bulletin, and more information about wood poles the reader can access www.woodpoles.org.

Discussion Cont'd.

In Hurricane Katrina, Mississippi Power Company (MPC), which serves most of coastal Mississippi, bore the brunt of the damage, but significant damage occurred as far north as Starkville and beyond. The author's observations in the area of his home, which is in Gulfport, Mississippi, and about 15 miles from the coast, were that 80% or more of the wood distribution poles were still standing, but virtually 100% of the spans were on the ground, primarily as a result of fallen trees and other debris. The author's communication with the Corporate Information Manager with MPC confirmed this phenomenon. Mississippi Power reportedly sustained damage to about 65% of its transmission and distribution system which consists of approximately 6,000 miles of line. There were approximately 26,500 spans down, but they replaced only about 9,000 poles out of their standing inventory of approximately 200,000 poles.

In September of 2005, Hurricane Rita struck western Louisiana and eastern Texas causing extensive damage in the coastal areas. Entergy reported 77% of its 372,891 Texas customers were without power for some period of time. Approximately 8,870 distribution poles, or approximately 2.8% of its standing distribution inventory, were replaced. Approximately 5.6% of its 142,358 distribution transformers were replaced. In addition, approximately 981, or 2.8%, of the 34,600 wood transmission poles were replaced, and 26 or 2.8% of the steel lattice transmission towers required replacement. (Entergy presentation filed with Texas PUC on January 30, 2006).

On November 30 - December 1, 2006, an ice storm hit portions of the Midwest. AmerenEU reported to the Missouri PSC that approximately 270,000 customers experienced a power outage. At the peak of the restoration effort, 4,391 personnel were involved. A total 214 miles of new conductor were installed and many miles of downed conductor were reinstalled, yet AmerenEU reported replacing only 392 poles in Missouri.

Based on these field reports, it appears that wood poles performed well and that the failure rate of poles was much lower than the failure rate of other system components.

Even though it is apparent that wood poles and other system components have performed as expected in these extreme weather events, the various PSCs continue to evaluate means to improve system performance. From a system design and construction perspective, there are some obvious avenues to investigate. Overhead systems can be made stronger by using stronger poles and other system components, reducing spans, increasing guying, increasing safety factors using present design loads or increasing extreme weather design loads to higher values. The difficulty is not in the design or construction of a hardened system, the difficulty is in the ability to quantitate the expected performance improvement so that rational decisions can be made regarding increased costs, which must be paid by the consumer, versus an anticipated future benefit. The actual loads imposed by extreme weather events are difficult to quantify. The load of a 40mph wind on a conductor covered with 1/2-inch of radial ice is quantifiable, but the load of an ice-covered tree blown into a line, or a section of mobile home blown into a line is not readily quantifiable.

The Florida PSC considered requiring that all distribution lines be designed to the NESC extreme wind loading criteria. The current NESC exempts structures 60 feet and less in height from the extreme wind loading criteria of Section 250A of the code. For the last several code cycles, proposals have been made to remove the 60-foot exemption. The overwhelming comments received on the proposals were that most storm failures are associated with secondary damage effects and that designing to extreme wind would have little effect on observed damage. Based on these field comments, the NESC has retained the 60-foot exemption.

Greatly reducing span length and greatly increasing the number of poles per mile is one way to meet the extreme wind criteria. If secondary damage

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Glacier Electric

Class 5 and 40 ft. Class 4. Serving some 5,000 members, Glacier Electric has 7,054 meter connections.

Glacier Electric purchases power from Bonneville Power Administration, which is delivered over Western Area Power Administration (WAPA), Glacier Electric, and Northwestern Energy transmission lines. The utility uses an independent agency for inspection and remedial treatment of poles as required.

Hardening of Utility Lines

effects are indeed responsible for most pole failures, then this approach could result in more pole failures rather than fewer and the time to restore service could be longer rather than shorter. The utilities in Florida indicated that requiring distribution systems to be designed to extreme wind criteria would double to quadruple the cost. Based on this feedback from utilities, the Florida PSC dropped its demand that all distribution lines be designed to the NESC extreme wind load criteria. Instead, they have asked the utilities to harden lines serving critical infrastructure such as hospitals, police stations, and fuel terminals, and to complete forensic analyses in future storms to evaluate the effectiveness of the targeted hardening. In addition, Florida has mandated inspections at set frequencies for all lines and improved vegetation management for all lines. There is a vigorous debate going on in Florida over how the costs of hardening will be distributed between the utilities and the third party attachers.

This bulletin will conclude in the next issue of Cedar Pole News.

Did You Know?

Each person in the U.S. uses wood and paper products equivalent to what can be produced from one 18-inch diameter 100 ft. tree every year. More than 5 trees are planted for each American every year.

The U.S. Forest Service estimates an average of 1.74 billion trees are planted in the U.S. every year.

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.

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