

# Cedar Pole NEWS

## Cedar Poles Are Mainstay Product for Two Montana Utilities

*Located in Montana's "Big Sky Country," Beartooth Electric and Vigilante Electric Cooperatives have power distribution spread over many square miles. Both utilities use long-lasting, reliable Western Red Cedar poles.*

### **B**eartooth Electric Cooperative

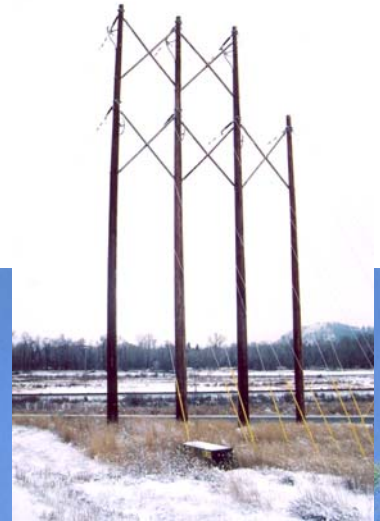
Located in Red Lodge, MT, Beartooth Electric Coop services a 2,880 square mile area, and has used Western Red Cedar poles exclusively for many years.

With more than 50,000 poles in their system, the utility has some 1,600 miles of lines in Stillwater, Carbon and Sweetgrass Counties in Montana, and the City of Clark, Wyoming.

Only 22 miles are transmission lines with a voltage of 69kV. The remainder are distribution lines carrying 12kV and 25kV. Typical pole heights range from 35 ft. to 45 ft., Class 6 or larger.

Beartooth has seen a large jump in power consumption, 44% during the past year. They attribute this growth to the

*Last year a new, three-phase line was installed using Western Red Cedar poles. Leading to a mine near Nye, MT, this line installation included a crossing of the Stillwater River, a highway and railroad. The 12.4 kV double circuit distribution line used 80 ft. Class H-1 poles on one side of the river and 75 ft. poles on the other.*



# "Big Sky Country" Coops Rely on Cedar

increased number of retirees moving to the area, and the growth of recreational activities and destination resorts nearby.

To serve this growth, a new three-phase transmission line will be installed along Highway 92 to Clark, WY. Part of the line will be 65 ft. single pole construction, with H-frame used at the ridge crossing.

Some 85% of their power consumption is residential, 11% is commercial (including mining), and 4% is for agriculture/irrigation.

Currently power production is hydro generated, and delivered by the Western Area Power Authority (WAPA) and Bonneville Power Administration (BPA).

By 2010, they expect 90% of their power will be supplied by a generating plant in Great Falls, MT, using readily available coal processed by emerging environmentally friendly technology -- fluidized bed coal combustion (FBC).  
*See page 4 for more information.*



*Due to a recent road widening and new bridge installation, this line at Reedspoint, MT, was installed using three-phase, 40 ft., Class 6 cedar poles for distribution.*

## **V**igilante Electric Cooperative

Spread over 18,800 square miles, Vigilante Electric Coop is headquartered in Dillon, MT, and provides electrical power in nine southwest Montana counties and one Idaho county.

There are some 47,000 Western Red Cedar poles in the system with 27,000 of those more than 25 years old.

The oldest cedar poles still in service are almost 70 years old. Vigilante Electric, which uses full-length, penta-treated poles, counts on cedar for its long-length of service, durability and reliability.

Vigilante Electric's 125 miles of transmission lines carry 69kV, and the more than 2,600 miles of distribution lines carry both 14.4kV and 7.2kV.

Three of their substations connect to Bonneville Power lines. Additionally, power is wheeled to fifteen other Vigilante substations over the lines of Northwest Public Power Administration.

Agriculture/irrigation consumes 60% of the utilities power, 25% is provided to residential markets and the remainder is used by commercial customers.

About 2,500 to 3,000 poles are inspected annually. Over the last ten years, this has resulted in a 2% to 3% replacement rate a year. Poles taken out of service are often sold to customers for use in agricultural areas.

Vigilante has one of the best non-interruption services records among coops. They attribute this record to their tree trimming program. Customers who have trees growing near or into power lines are encouraged to call the utility which will trim or cut down trees free of charge.



*Southwest Montana is one of the few areas where high-grade talcum is mined. Expanding operations of a local mine required additional power. Vigilante Electric built a new three-phase line using 40 ft., Class 5 cedar poles along Sweetwater Road, above, and for the line to the mine, below. Talcum is not only used in powder, but it is also used in the paint and plastics industries.*



# In Search of the Perfect Utility Pole

by Dennis Hayward

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For over a century utility managers have searched for and dreamed about the *perfect utility pole*: a pole that is economical, always in good supply, environmentally friendly, easy to install, strong enough to handle every challenge and able to last forever with no care or maintenance. The search and dream goes on - truth is there is no perfect pole. Different materials offer different advantages in different applications. But one material, **Wood**, has withstood the test of time and the challenge of alternative materials. The Utility industry estimates there are over 130 million treated wood poles currently in service in the U.S. and several million new ones enter into service each year. Alternative materials represent less than 1% of the distribution poles and wood remains a major player in the transmission market.<sup>1</sup>

While treated wood may not have the high tech image promoted for newer materials, sometimes it is just plain hard to improve on Mother Nature and time-proven performance. A recent Utility association analysis identified wood poles as "The Electric Utility's Material of Choice" concluding that "*The bottom line is that treated wood offers the most energy-efficient, functional, cost-effective and practical material for use by electric utilities in providing electrical service to the public.*"<sup>2</sup>

As the search goes on for the perfect pole, it is the characteristics of wood against which the challengers are measured. Wood has set the standards.

**Economics.** Whether decision criteria consider initial materials and installation or the full life cycle costs, the economics of wood poles are unsurpassed. The 1996 Competitive Products Research Study evaluated the relative life cycle costs of various products.<sup>3</sup> It was shown that wood systems were generally 15% to 25% more cost effective than alternatives on a total life cycle basis, a position which has been enhanced by the accelerated cost increases in steel and other high energy consumption products.

**Service Life.** Where poles are not removed prematurely for right of way or capacity change outs, the independent experts have established that it is reasonable to expect a wood pole line that is managed and maintained to have a life of 75 years or more and "*..there is an increasing body of evidence that average service lives may extend to 80 to 150 years where poles are properly specified and maintained.*"<sup>4</sup>

**Strength.** The recently completed review and refinement of the ANSI Wood Pole Standard has affirmed that wood poles are as strong as ever. The preliminary findings of a soon to be released study of over 22,000 individual wood poles of all major species across a full spectrum of sizes clearly demonstrates that concerns that today's wood poles fall below the dimension, ring count and strength requirements of the standard are unfounded.

**Design.** The basics of line and structure design remain based on wood. For more information, review the recent technical guide, *The Wood Pole 2005 – Design Considerations, Service Benefits and Economic Reward.*<sup>5</sup>

**Installation and Maintenance.** The strength and resilience of wood, along with the deep penetration of the protective treatment, enable wood poles to withstand considerable abuse when being handled and installed. Unloading is fast; special slings or equipment are rarely needed. Considered safer by linemen, wood poles require no special climbing hardware when bucket trucks cannot be used. Maintenance is simple and can be performed by trained personnel with the pole in place. Installation and modifications are easy with drilling, reframing, and adding or changing hardware performed promptly on the spot.

**Reliable Supply.** The vast managed forest resources in North America assure an adequate sustainable long-term supply of wood poles. Despite sporadic short-term inventory challenges for some classes, the wood pole industry has met both routine and emergency needs of the utility industry. Faced with national hurricane disasters of unprecedented scale in 2005, the wood pole industry was able to respond effectively, beginning shipments within hours with the over 100,000 needed poles delivered in less than a month.



**The Environmental Leader.** Using only seed, soil, water, sunshine and time, Mother Nature produces new poles on a renewable basis, while converting green house gasses to oxygen and sequestering carbon in the process. With production that consumes radically lower levels of energy and generates dramatically less air and water pollution than other materials, the wood pole has truly set the "green" standard. Treated with only EPA-registered preservatives and classed for ultimate disposal as a non-hazardous material, wood represent the most appropriate cradle-to-grave pole material.

**Finding the Perfect Pole.** While not perfect, the wood pole is the industry standard for a multitude of reasons. For more details and access to an extensive data base of information the reader is urged to visit the North American Wood Pole Council web site at [WoodPoles.org](http://WoodPoles.org).

<sup>1</sup> Utility Solid Waste Activities Group (Edison Electric Institute, National Rural Electric Cooperative Association, American Public Power Association), January 31, 2005, Submission on EPA Docket OPP-2004-0402, 13 pages, available on line at [WOODPOLES.org](http://WOODPOLES.org).

<sup>2</sup> Utility Solid Waste Activities Group, Ibid.

<sup>3</sup> Western Wood Preservers Institute, *Lifecycle Study Proves Wood Is The Best Investment*, Wood Pole Newsletter #23 1997, 8 pages.

<sup>4</sup> Western Wood Preservers Institute, *Wood Poles, How Long do they last?* Wood Pole Newsletter #20 1996, 5 pages, summarizing finding of EDM and Dr. Jeff Morrell, OSU.

<sup>5</sup> North American Wood Pole Council, September 2005. *The Wood Pole 2005 – Design Considerations, Service Benefits and Economic Reward*, Richard Lovelace, Hi-Line Engineering, 12 pages, available on line at [WOODPOLES.org](http://WOODPOLES.org).

## Fluidized Bed Coal Combustion (FBC)

Clean Coal Technology (CCT) describes a new generation of processes for the production of electricity and fuels from coal.

CCT's are designed to increase the energy efficiency and to reduce the environmental effects of coal use.

CCT's reduce air emissions, waste products and other pollutants compared to older coal-based systems, and increase the amount of energy gained from each ton of coal used.

Coal remains one of the world's lowest-cost fuels for electric power generation, and CCT continues to improve coal's economic and environmental acceptability.

Fluidized bed combustion (FBC) is a method of burning coal in a bed of heated particles suspended in flowing air. At sufficiently high air velocity, the bed acts as a fluid resulting in rapid mixing of the particles (somewhat like a popcorn popper).

The fluidizing action promotes complete coal combustion at relatively low temperatures, and provides a means to transfer combustion heat efficiently from

the bed to steam tubes.

FBC evolved from efforts to find a combustion process able to control pollutant emissions without external emission controls.

At approximately 2500°F, the nitrogen and oxygen atoms in the combustion air combine to form nitrogen oxides (NO<sub>x</sub>).

However, in the FBC furnace, the fuel burns at temperatures of 1,400°F to 1,700°F, which greatly suppresses NO<sub>x</sub> formation.

The mixing action of the fluidized bed brings the flue gases into contact with a sulfur-absorbing chemical (sorbent), such as limestone or dolomite.

More than 95% of the sulphur in coal can be captured inside the furnace by the sorbent.

The efficiency of FBC for power generation is similar to that of a conventional pulverized coal power plant. However, this technology provides better environmental performance.

There are now more than 400 FBC units being used worldwide.

--Coal Utilization Research Council

## DID YOU KNOW?

To grow a pound of wood, a tree consumes about 1.47 pounds of carbon dioxide and releases approximately 1.07 pounds of oxygen. Realistically, an acre of trees could be expected to grow 4,000 pounds of wood per year. In the process, 5,800 pounds of carbon dioxide would be consumed and 4,280 pounds of oxygen would be produced.

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