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

Vol 22, Issue 2

Cedar Pole NEWS

Sacramento Utility Uses Environmentally Friendly Poles

Sacramento Municipal Utility District (SMUD), in an effort to use more environmentally friendly products, began using butt-treated Western Red Cedar utility poles in 2003.

The utility is now using cedar poles from 30 ft to 65 ft. and Class 1 through 5. The poles are butt-treated with copper naphthenate which has reduced the chemical preservative required to treat Sacramento's annual pole volume by some 90%, or approximately 15,000 gallons annually.

Copper naphthenate (CuNap) is an oil-borne preservative which is highly effective against wood-destroying fungi and insects.

Western Red Cedar is the only species permitted by AWPA Standards which can be butt treated. Building codes recognize cedar as a naturally durable species. SMUD switched to cedar in 2003, and to copper naphthenate for the butt-treatment in 2004.

SMUD has a ten-year inspection cycle for transmission and distribution poles. SMUD serves a population of 1.4 million people in Sacramento County and a small portion of Placer County directly north of Sacramento, for a total 900 square mile service area.

The utility has over 522,000 residential connections, and over 67,000 non-residential connections. Of the non-residential connections, 8.5% are commercial, 5.4% are agricultural and industrial, and street lighting accounts for the balance.

SMUD's electrical system has 473 miles of transmission lines and 9,784 miles of distribution lines. Transmission lines are

This SMUD utility pole on Valley Highway is 65 ft., Class 2, carries 69kV, and is butt-treated with copper napthenate. As seen here, poles are treated to one foot above ground using only 10% to 20% of the preservative required for full-length treatment of other species.

SMUD Uses Butt-Treated, Environmentally Friendly Cedar

Cedar poles installed along this highway are 50 ft. Class 2, and support 69kV and 12kV conductors. Western Red Cedar is the only pole species with natural decay resistance without being full-length treated.

230kV and 115kV, and distribution system voltages are 69 kV, 21kV, 12kV and 4kV.

Sacramento County is expected to grow by nearly one million residents by 2050. SMUD's load-serving capability must grow as well, particularly during the peak hours of summer use.

Greenhouse gas reduction regulations, soon to be promulgated in California, will significantly constrain traditional fossil fuel for power generation.

Forty-five percent of the utility's power comes from non-carbon emitting sources. Of this, 49% is from SMUD hydroelectric generation, 46% is from purchased renewable power and hydroelectric generation, and 4% from wind and solar generation.

Other sources include gas-fired generation and other purchased sources.

The Upper American River Project generates about 15% of SMUD's electricity in a normal water year.

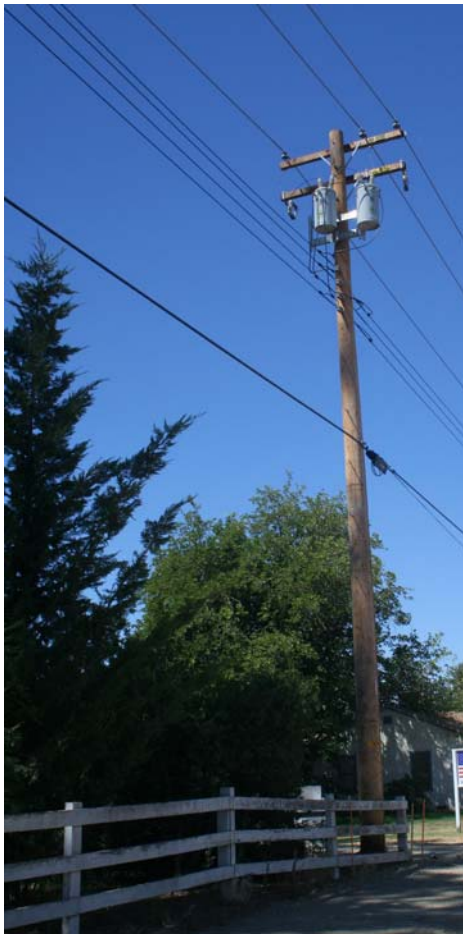
Wind and solar power are important non carbon-emitting resources for SMUD. The utility plans to exceed the state's energy efficiency requirements by 50% over the next ten years.

SMUD is also helping customers reduce total energy consumption by 15% over the next 10 years. Higher levels of efficiency will reduce peak generation by 570 megawatts by 2017. This amount is greater than the capacity of SMUD's Cosumnes River Power Plant.

A landmark year in 2007, SMUD exceeded 10 megawatts in solar capacity for the first time. SMUD has also signed partnerships with a number of homebuilders to construct more than 2,600 solar powered homes throughout the region.

The Solar Smart® homes partnership provides incentives to buy down the cost of the solar electric systems and provides rebates for energy efficient upgrades.

These rebates and incentives, along with attractive tax credits to buy down the cost of the solar electric systems,



This cedar pole is a 50 ft., Class 2 pole carrying 12kV and secondary voltage, as well as phone. Cedar poles have been butt-treated since before 1900, and were the backbone of much of the early electrification in the U.S. and Canada.

make solar electric systems more affordable than ever. Solar systems have made significant strides in the area, helped by municipalities waiving permit fees and agreeing to review residential solar applications in one day.

SMUD, along with the Sacramento Tree Foundation has planted 430,000 shade trees since 1990. Fully grown, properly placed trees can cut home cooling costs by up to 40%.

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

The last installment of the North American Wood Pole Council Technical Bulletin VII, which 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.

Another way of potentially improving storm performance is to move overhead systems to underground. This approach is generally popular with the public until the potential impact on rates is understood. It is true that underground lines are generally less exposed to the large physical loads associated with extreme weather events. However, they are not totally immune to failure in storms. Pad-mounted transformers are subject to storm surge and other secondary damage effects. On the Alabama coast in Hurricane Ivan in 2004, many miles of underground lines were physically uncovered and destroyed due to wave action and storm surge. Some locations in this area were without power for more than a year as a result.

Although underground lines may be less likely to have an outage, the time to locate and repair the outage is much longer than for overhead. A study published by Edison Electric Institute (EEI) in 2006 (Out of Sight, Out of Mind?, July 2006) reports that overhead lines in the State of Virginia in 2003 experienced outages at rates 4 to 5 times that of underground, but the average duration of the outage for underground systems was about 2.5 times that of overhead systems. A study by the North Carolina Utilities Commission (The Feasibility of Placing Electric Distribution Facilities Underground, November 2003) for the years 1998-2002 showed that underground systems experienced about half the outages of overhead, but the duration of the underground outages was 1.6 times longer. Therefore, much of the reduced frequency advantage of underground is offset by the increased duration of the outages.

The EEI report also contains some information that suggests that the outage advantage of underground diminishes as the system ages. One utility reported better reliability in 40-year-old overhead lines than 20-year-old underground lines. Maryland utilities reported underground systems were becoming unreliable after 15 to 20 years and that they were nearing the end of their service life in 25 to 35 years.

Although a significant portion of new distribution lines are going underground, cost remains a significant deterrent to replacing existing lines with underground. The increased cost for installation of new lines is typically paid by the developer who simply rolls those costs into the price of the lots being sold. The ratepayer would have to bear the cost for undergrounding existing lines. The EEI report and the North Carolina Utilities Commission study indicate that the cost of underground construc-tion may be about 10 times the cost of overhead. North Carolina concluded that embarking on a state-wide program to replace overhead lines with under-ground would require a 122% increase in utility bills, and it would require 25 years to complete the work. Based on this data, North Carolina concluded that it was not financially feasible to pursue. The EEI study found that the cost to underground was typically about 10 times more than consumers were willing to pay.

Summary and Conclusions

The desire to improve the performance of utility systems in extreme weather events is shared by consumers, utilities, and state regulatory commissions. Given that it is impossible to design and build a system that can not be damaged by catastrophic natural events, the question becomes one of balancing increased costs and potential benefits. While increased costs can be calculated for any incremental level of system hardening, the potential benefits are largely unquantifiable because of the difficulty in determining the frequency distribution of actual loads that may be placed on the system in an extreme weather event.

Considering these difficulties, the prudent approach would appear to be one which provides targeted hardening of certain lines or line segments and comparing the response of these lines to lines of normal construction located in the same area and subjected to similar conditions in terms of wind exposure and secondary damage.

Only through forensic analysis of the performance of various designs and construction methods can rational decisions be made regarding whether present designs and construction are optional from a storm response perspective.

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Butt-Treated Poles: Cost-Effective With Low Environfmental Impact

Western Red Cedar is the only pole species with natural decay resistance necessary to give long service life without being full-length treated. Cedar is also the only species for which a butt-treatment national standard is published.

Butt-treated cedar is a particularly environmentally friendly product as well as providing a very economical pole. This is possible as only the butt to one foot above the ground is treated, which means a butt-treated pole uses only 10% to 20% of the preservative required for full-length treatment for other species.

As only a little more than the length of the buried portion of the pole is treated, the total pole cost is less. Butt-treated poles are a cost-effective product in many areas.

In addition, when butt-treated poles are removed from service, the treated portion can be cut-off and used for posts, while the rest of the pole can be recycled -- often milled into lumber or siding. As a result, butt-treated poles have a very low environmental impact during their service life, and upon removal offer easy disposal.

Western Red cedar is a prime species for poles because of its natural durability, large size, straight grain and easy of climbing. Cedar has a very thin layer of sapwood that is relatively easy to treat.

Cedar is lightweight, easy-to-handle and withstands severe weather conditions. The species straight grain and uniform texture minimizes pole fracture caused by severe weather or mechanical damage.

Cedar's heartwood produces chemical compounds called extractives that naturally resist decay, fungi and insects.

Did You Know?

Western Red Cedar will absorb or discharge moisture to achieve equalibrium with the surrounding atmosphere. With a very low shrinkage factor, Western Red Cedar is superior to all other conifers in resistance to warping, twisting and checking.

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.