New solution to a perplexing problem ... or should I say pileated problem?

BY RICHARD HEVERLEY

A NUMBER OF years ago, I was very rudely awakened at the crack of dawn one Saturday morning by someone hammering something. My first thought was that it sounded like a crew of carpenters nailing shingles on a roof somewhere nearby. My second thought was, who would have the nerve to start working on a roof at the crack of dawn on a Saturday — don't they know it's my morning to sleep in?

After trying to ignore the racket and go back to sleep, which wasn't happening with that incessant hammering, I finally got out of bed (more than a little upset, to put it nicely). When I went outside to see who was causing all the racket, I discovered it wasn't an inconsiderate neighbor, but rather, it was two of the biggest woodpeckers I ever saw attacking a woodpile I had down behind my house.

These woodpeckers were pounding away at those logs with a force I couldn't achieve with the 16-ounce hammer I



PERSISTENT WOODPECKERS: This is the top section of one of the poles, which is almost 14 inches in diameter. The cavity the woodpecker made in the pole's center is about 7 inches in diameter and 14 inches long. I could have easily put a half-gallon milk jug inside it to give you perspective, instead of the coffee cup, but you get the point – these holes are big. This is just one of over a dozen woodpecker holes in this pole alone.



would be using if I were driving roofing nails. They were flinging pieces of bark and wood everywhere in search of insects. After watching them for a while, I had to admit they really were beautiful birds and they certainly were good at pecking that wood to pieces. This attack on my woodpile went on for several weeks until the woodpeckers apparently found better tasting bugs somewhere else — thank goodness.

That was the last time I even thought about woodpeckers until a couple of years later when our manager of engineering, Steve Long, started voicing concern about woodpeckers pecking holes in some of our electric poles. A short time after that, I found Steve out back in our storeroom with some of our linemen experimenting with some specially designed hole-patching compound that could be used to fill woodpecker holes in poles to maintain the structural integrity of the pole. This compound not only had to repair the pole, it also had to have the consistency of wood to allow our linemen to climb the poles without their spikes hitting a hard cement-like compound that would make their spikes slip. Satisfied that they had found a solution, Steve had the linemen patch the holes

BEAUTIFUL BUT DESTRUCTIVE: This isn't the woodpecker responsible for destroying our poles, but he is a cousin to the ones that did. Although nobody from United Electric ever saw the woodpeckers at work, given the size of the holes and the cavities pecked inside the poles, the pileated woodpecker is most likely responsible for the damage to our electric poles.

left by the woodpeckers and it was assumed everything was taken care of.

Not so. These determined woodpeckers just started pecking these poles in other spots, fully convinced that there were insects in these poles, which there were not. The poles these woodpeckers were attacking so insistently were relatively new yellow pine poles treated with penta, and there were no insects in the poles for the woodpeckers to feed on. But for some reason, they were thoroughly convinced there were bugs, and they were going to find them.

A solution had to be found. The damage being done to these poles was reducing the structural integrity of the poles, and we could not have poles falling down and causing an outage for the members served off of that line. Steve began searching for a viable solution to the problem. The options he investigated to replace the wooden poles were: steel, aluminum, cement and fiberglass. After carefully considering the advantages and disadvantages of all the options available to him, and of course, the cost, Steve decided the best option would be to replace the wooden poles with fiberglass poles.

The company selected to provide the fiberglass poles was Creative Pultrusions Inc. (CPI), located in Alum Bank, Pa. United Electric's engineering department began working with the engineers at CPI designing the custom poles that would meet the needs of this particular project. Due to the specialized nature of working with fiberglass poles, all of the needed hardware and cross beams were designed and provided by CPI to ensure the job would be completed with no damage or undue stress points on the poles.

It took about three months for Steve and his staff to be sure all of our concerns were addressed prior to ordering the material needed to complete the job. The poles would be 16 inches in diameter from the top cap to the bottom plug, with 1/2-inch fiberglass and vinyl resin walls, and weigh 1,394 pounds. After allowing another month for the actual production of the poles and crossbeams, the material was finally ready and the pole replacement project could begin.

Steve informed me that crews were starting the job, and suggested that it might be something I would want to get pictures of. He gave me detailed direc-

tions of how to get to a place called Moravian Run. Now most of you in the Shiloh and Deer Creek area are probably familiar with this area, but it's one of the places in our service territory that I had never seen before. Following Steve's directions, I turned off Deer Creek Road where he said, followed that road till it ended, cut through an old trail onto our right-ofway and followed that through some particularly soupy terrain for about another mile and I had arrived at Moravian Run almost.

It seems I had missed something during all the talk I had heard about

these poles the woodpeckers were destroying. I was picturing poles like the ones in front of your house and my house. I thought we were talking about poles with a crossarm and four electric conductors strung between them — our standard three-phase construction. But that's not what I saw when I got to the construction site. Instead, what I found was a three-pole structure with crossbeams connecting them and guy wires in all directions holding them in place on the edge of a mountain top. And



HOTO BY STEVE LONG

POLES TO THE JOB SITE: BNF Line Construction (the contractor we used to complete this project) hauls three of the poles up the right-of-way to the job site. Each side of the crossings at Moravian Run required three of these 60-foot-long, 1,394-pound fiberglass poles.



MORAVIAN RUN PROJECT NEARS COMPLETION: The new structure is completed and has been re-energized. The only thing left to do is to remove the bottom half of the wooden poles in front of the structure. If you look closely, you can see gray spots on the pole that are the patches we put in place earlier. All of the new woodpecker holes don't show up in this photo.

when I looked out across the valley where the wires were running, I could see a matching structure on the opposite mountaintop - 1,460 feet away.

That's why I said earlier that I almost got to Moravian Run, because I never even saw Moravian Run. It was in the woods down over a steep incline in the bottom of that valley, and there was no right-of-way cut between those structures. Now I understood why Steve was so concerned about the poles and the possibility that the woodpecker damage might cause them to fall down. If those conductors had come down in the thick woods in the valley between those structures, it would have taken days to cut the line out of the trees below and get it restrung. It would have been a real nightmare scenario, to say the least.

The other thing that I was amazed at was the number and size of the holes these woodpeckers had pecked in these poles — all three of the poles on each side of that crossing. The woodpeckers completely ignored the poles leading up to these structures and had concentrated their efforts only on those poles. This brought up a good question. Why just these poles? As I pointed out earlier, there were no insects in the poles for the woodpecker to feed on, and some of these holes *(continued on bage 12d)*

New solution to a perplexing problem

(continued from page 12c) had to have taken weeks to peck into the hard yellow pine cores of the poles.

None of us here at United Electric are ornithologists (bird experts), but Steve had a theory he had heard of while studying for his engineering degree - a phenomena known as aeolian vibration. Aeolian vibrations are high-frequency sounds caused by wind blowing across a conductor, especially when wind blows across a long span of conductor, and that certainly describes the Moravian Run crossing. The speculation is that these aeolian vibrations caused a sound in the poles that made the woodpeckers think there were insects in those poles if they just pecked a little deeper. I, for one, am buying that story because my only other theories are that these were just some really dumb woodpeckers, or they really hate that line crossing the valley and were determined to bring it down — neither of which sounds as likely as Steve's theory.

So even though his theory is unproven (but the most logical explanation), and even though vibration dampers didn't deter the woodpeckers on the wooden poles, Steve designed in vibration dampers on this project with the new "woodpecker-proof" fiberglass poles. On each conductor, on both ends of the crossing, there are some strange looking things with counter-balanced weighted balls that are supposed to stop or at least lessen the vibrations. With these in place, the woodpeckers, hopefully, will not waste their time or hurt themselves trying to come up with a way to get into the new poles. One thing I know I'm glad of (especially when I saw the huge hole they pecked in the pole in the photo with this article) is that I didn't have to listen to that woodpecker hammering away at that pole outside my bedroom window.

In my run-in with woodpeckers, I had to just hope they would eat all the bugs in my woodpile and go somewhere else so I could go back to sleeping in on Saturday mornings. That was not an option for United Electric, we had to find a remedy for the problem in order to maintain a safe electric system and provide our members reliable power. That's what co-ops do.

Energy Efficiency Tip of the Month



Looking for an easy efficiency upgrade? Additional insulation can make a difference! The Department of Energy estimates you can reduce heating and cooling needs up to 30 percent by properly insulating and weatherizing your home.

Source: energy.gov

Do you know what your water heater is doing while you sleep?

Hot water is essential in performing many of our household chores. Showers, laundry, dishes – they all require hot water. If you think about it, we use a significant amount of energy to heat water. Now, utilities and manufacturers are teaming up to bring you new water heaters equipped with technology that can make the electric grid smarter and more efficient.

Water heaters are unique among electric home appliances. They are omnipresent, use significant amounts of electricity and can store thermal energy for hours at a time.

For decades, electric co-ops have partnered with their members on "load management programs," which allow the co-op to turn home water heaters on and off in order to reduce how much power the co-op uses during peak periods, when power is more expensive. Members often get a break on their bill in exchange for participation. New communications and automation technologies make this process even more reliable, predictable, and efficient.

United Electric is one of more than 250 electric co-ops in 35 states that use large-capacity, electric resistance water heaters that can reduce the co-op's power cost and store electricity. For example, when most of us are sleeping and wholesale power is cheaper – the electricity produced can be used to heat water in our homes. The water will remain hot even if the water heater is turned off for a short period. In other words, collectively, water heaters can act like a battery, storing energy.

For all of these reasons, electric co-ops were dismayed in 2010 when the U.S. Department of Energy issued new efficiency standards for electric water heaters that would have made demand response programs using large-capacity, electric resistance water heaters difficult.

For the last five years, electric co-ops have been working with efficiency advocates, manufacturers and others to ensure that we can take advantage of new technologies that benefit our members. In April, Congress passed legislation that allows co-ops to continue to run these demand response programs.

Electric co-ops across the country hailed this bipartisan legislation as a win for consumers. Collectively, the current water heater programs can reduce demand by an estimated 500 megawatts, saving consumers hundreds of millions of dollars and avoiding the need for new power plants. At United Electric alone, we are able to save our members over a half million dollars a year through our load management system.