

# AEP-PSO Moves From Overhead to Underground

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**By Kathleen Davis, senior editor, and Teresa Hansen, editor-in-chief**

Customers have an aversion to lines and poles overhead. In addition, they generally don't like utilities to trim their trees. That's the case in Tulsa, Okla., said Steve Penrose, distribution support manager for American Electric Power's Public Service Co. of Oklahoma (AEP-PSO). This is one reason AEP-PSO decided to begin burying some of its distribution lines.



*This is an example of the finished AEP project.*

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Burying lines is not cheap, Penrose said. Although underground line is often thought of as

more reliable than overhead line, the reliability improvement is small, he said. Buried lines have less exposure to the elements, which lowers power interruption frequency (SAIFI: system average interruption frequency index); it takes longer for personnel to locate and repair problems, however, which increases power interruption frequency (CAIDI: customer average interruption duration index). Therefore, reliability alone was not an adequate reason for AEP-PSO to implement its overhead-to-underground conversion project.

In 2004, the Oklahoma Corporation Commission (OCC) required the utility to adopt a four-year, rotating tree-trimming program. Penrose said that prior to the OCC requirement, AEP-PSO had been “too concerned about an owner’s private property issues” and got behind on keeping tree-trimming properly updated. In January 2005, AEP-PSO launched its Reliability Enhancement Plan, which included intensifying its tree-trimming efforts to achieve the four-year cycle trim on its distribution lines. The new program met a lot of customer push back, Penrose said.

Keeping customers happy was a priority for AEP-PSO, but so was reliability, and so was complying with the OCC requirement. The company saw overhead to underground as a viable option to tree trimming in some neighborhoods.

“Trimming moves trees away from the lines,” Penrose said, “but burying moves the lines away from the trees.”

Therefore, as part of a rate case that went before the public service commission in March 2005, AEP-PSO included permanent funding to pay for the conversion of certain overhead power lines to underground service in targeted neighborhoods. The public utility commission approved funding and AEP-PSO began the pilot in 2005 and geared up in 2006, Penrose said.

Since AEP-PSO began the program, it has replaced more than 90 miles of overhead distribution line with underground line. The utility has targeted older neighborhoods with back-lot distribution systems that are between 40 and 60 years old. The new underground systems are installed in front yards, giving AEP-PSO personnel much easier access to the lines.

“Our workers no longer have to contend with dogs, locked gates, swimming pools and landscaping,” Penrose said.

## **Lessons Learned**

Penrose said that the company has learned important lessons since first implementing the project.

“This is as much a customer public relations program as it is a reliability program,” he said.

The utility has discovered it is important to communicate clearly and early with customers and property owners in targeted neighborhoods. Penrose said AEP-PSO personnel meet and talk to local government officials, homeowners associations and others who represent affected customers. They also conduct neighborhood meetings before the utility begins work to answer property owners’ questions.

“We understand that PSO is a guest in these neighborhoods,” Penrose said. “The customers didn’t invite us.”

He also said the some neighborhoods don’t want the conversion. Before it makes a final decision on a neighborhood, AEP-PSO polls customers.

“Without 60 percent or better approval, we don’t go forward with the program,” he said.

“We move on to another neighborhood.”

The company also learned that most customers do not want above-ground transformer boxes in their neighborhoods and certainly not their yards. The company, therefore, switched to flush-grade pedestals during the project. Although these pedestals cost more, make access to equipment and its maintenance more difficult and sometimes fill with water, happy customers are more important than any of these issues, Penrose said.

AEP-PSO tries to keep buried lines in the road rights-of-way, but it also prefers lines to be behind neighborhood sidewalks, which sometimes push them back behind road rights of way.

When AEP-PSO moved its lines, it allowed local television cable and telephone companies to move their lines, as well. In most cases, the cable TV company moved its lines to the street with the AEP-PSO line. The telephone company, however, did not and took ownership of the poles.

## **Current Project Status**

Every day there’s a new story on how the recession impacts America, and AEP-PSO is not immune. In March of this year, the utility suspended the program because of problems

with capital and the program's low-priority status.

"We're having difficulties," Penrose said. "We're cash-constrained ... replacements and infrastructure take top priority over discretionary projects. We're going back to the meat and potatoes of this utility."

The financial crisis brought a need to focus on cash flow, said David Sartin, director of business operations support for AEP-PSO.

"Essentially, because of that issue, overhead-to-underground fell off the bottom of the list," Sartin said.

Penrose said the program itself is capital-intensive, costing the utility \$20 million a year. While that cost increase normally would be financed on the back end by an eventual increase in customer rates, there's a requirement for up-front financing at the start of any program.

AEP-PSO traditionally used a debt-to-equity mix of 55 percent long-term debt and 45 percent common stock equity to finance projects. The September-October 2008 slide in the financial markets hit AEP-PSO's reliance on short-term debt quickly, Sartin said.

"The commercial paper market virtually disappeared," Sartin said. "So we went to our backup of bank lines of credit to finance short-term obligations."

As with most Americans feeling the financial crisis, AEP-PSO's short-term obligations became the focus, with long-term programs such as the overhead-to-underground effort slowing almost instantly.

The overhead-to-underground program is the largest AEP-PSO program to be set aside during the crisis, but it isn't the only one getting pinched. Some inspection and review programs have been set aside or scaled back, as well.

For now, AEP-PSO is focusing on matching revenues and expenses, or, as Sartin calls it, "cash inflow vs. cash outflow."

"Basically," he said, "we're trying to balance better and have less risk."

AEP-PSO isn't just getting squeezed by those problems with the capital markets. Recently these financial problems have been compounded with a drop in revenue as the utility's big commercial and industrial customers are hit with downsizing and a lack of demand. Less

demand for the product means less need to run equipment, and that leads to reduction in power consumption.

As the utility continues to get squeezed, the executive management works to re-evaluate spending, limits and guidelines for all of the utility's operations.

The overhead-to-underground program isn't dead, however, just dormant.

## The Future and Customers

When the program halted in late March, the company had already accomplished some milestones: 90-100 miles converted one backyard at a time, 40 neighborhoods impacted, nearly 10,000 customers seeing benefits. AEP-PSO realized the program wasn't as expensive as initially estimated. Because the program doesn't focus on feeders that are costly to bury, the utility realized it was spending \$570,000 to \$580,000 per mile to bury the lines, rather than the original estimate of \$1 million per mile.



*Directional boring equipment is used to get the cable underground.*

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Still, it wasn't enough to keep the program going during this crisis. The utility has received empathy from its customers, Penrose said.

"Customers have been very understanding," he said, "although they are disappointed, of course."

What Penrose hears most from customers is concern about whether or not the program will restart once the financial crisis passes (it will) and if they can maintain their places in line when it does (they can).

The utility has no plans to kill the overhead-to-underground program. AEP-PSO knows the program “is a really good place to put it” when discretionary capital becomes available again, Penrose said. Finding contractors, training, designing and planning the conversions will take nine months to a year once given the OK.

“We don’t know dates, but there are plans to restart it,” Sartin said, “but first, the economy needs to improve. Unfortunately, we don’t have any better idea about when that will happen than anyone else does.”

Since it was originally part of the reliability enhancement program, do you expect the suspension of the overhead-to-underground effort to impact reliability?

“My feeling is that reliability is in the mind of the customer, and with the tree-trimming program, customers feel there’s better reliability today than previously, even with the overhead-to-underground program on hold.” —Steve Penrose

“Those with underground do see a reliability increase, that’s true. But our bigger bang for the reliability buck is the tree trimming. The overhead-to-underground conversion program has great benefits, especially in the area of customer satisfaction, but it is low-impact percentage-wise in the overall area of reliability.” —David Sartin