

## Working the plan for first-of-its-kind transformer refurbishment

August 16, 2007

*For the past two days, Newsline has followed the efforts of APS crews as they prepared to refurbish the 230/4.16-kilovolt (kV) transformer providing power to a commercial customer located outside Seligman. At the same time, crews would replace the 4.16/12-kV transformer at the Mt. Floyd Substation, which serves other customers in the Seligman area in northwest Arizona.*

Today, the third installment - putting the plan into action:

APS crews know how to refurbish transformers. It's a regular part of System Improvement Warehouses' work scope. It usually involves the transformer being out of service for close to two weeks. And Substation Maintenance-North knows how to replace transformers. The work is rather straightforward. However, it was getting the crews to the point of doing the actual refurbishment and replacement that took weeks of careful planning.

Now, with the planning done, it was time to work the plan. And, if the job went as planned, Seligman customers would experience no more than an 8-hour, late night outage.

That's why, under a clear, star-laden sky on Monday, Aug. 6, approximately two dozen APS employees from the Energy Control Center (ECC), Predictive Maintenance, Substation Maintenance and Substation Maintenance North, and System Improvement Warehouses, assembled at the Seligman Compressor Station. Elsewhere, crews from Transmission Line Maintenance were approximately 30 miles away at the Round Valley Substation and the ECC operators, who were 230 miles away at the 502 Building in downtown Phoenix, stood ready to get to work.

By sunset, crews had pre-staged as much equipment as possible. This would help expedite the work and minimize customers' outage time.

Following a thorough tailboard the crews went to work. With **Chuck Gillum**, Senior System Operations Planner, ECC, in phone contact with **Russ Kozimor**, ECC Supervisor – Transmission, ECC, and the Transmission Line Maintenance crews at the Round Valley Substation, the lines and transformers began to be de-energized. At about 10 p.m. the lights went out in Seligman.

Working under banks of halogen lights — and stopping periodically to swat at swarms of mosquitoes — Substation Maintenance-North and System Improvements Warehouses crews followed the plan's steps.

Their work included installing temporary connections between the 230-kV line overhead and the 230-kV mobile transformer known as the "immobile mobile". The "immobile mobile" was connected to the 69/12-kV mobile transformer. The 69-kV mobile would be connected to the Mt. Floyd Substation's 12-kV distribution line that supplies power to Seligman.

Work proceeded safely and with the precision of a fine Swiss watch, **Dan Matthews**, Construction/Maintenance Coordinator, Substation Maintenance North, said.

And, although the "immobile mobile" had not operated in the past 30 years, its start-up was a non-event, according to Gillum.

"That's just the way we wanted it," Gillum said.

By 3:11 a.m. Tuesday, or about 5 hours after the outage began, the lights were back on in Seligman. And the majority of customers slept through most, if not all, of the outage.

But that wasn't the end of the night's work. **Pat Buoy**, Senior P&C Technician, Substation Maintenance, and **Derrick Pase**, Substation Technician, Predictive Maintenance and crew continued working. They needed to clear the Seligman transformer so ABB, the contractor doing the refurbishment, could start work at 7 a.m.

"Our work was the last part of the lengthy switching order," **Tom Weber**, Construction/Maintenance Coordinator, System Improvement Warehouses, said. "But, they stayed to make sure the transformer work would stay on schedule."

After a day's sleep time (to comply with Department of Transportation Hours of Service requirements), Matthews, Weber and the crews were back on site Wednesday morning to continue working on transformers' refurbishment and replacement.

And, tomorrow night, with the 230/4.16-kV transformer refurbishment complete, they repeat the Aug. 6 work, only in reverse order.

Tomorrow, Part Four: A success story in customer communications.