



PART OF BURNS & MCDONNELL

CASE STUDY / SALT RIVER PROJECT

## Replacing 69-kV wood utility poles

Salt River Project's gas-treated wood poles had a high failure rate during high winds. Careful technical and economic analysis identified the optimal annual replacement rate to continue providing safe, reliable and affordable electric power to the region's 2 million customers.





## Batch replacement of 250 poles per year balances risk reduction and investment.

### Project stats

#### Client

Salt River Project

#### Location

Tempe, Arizona

**2M**  
electric customers served

**7K**  
poles evaluated

**10**  
budget scenarios analyzed

**250**  
poles replaced annually

#### Challenge

The Salt River Project (SRP) is a community-based, not-for-profit energy and water company serving more than 2 million customers in central Arizona. Like many other utilities, SRP faces aging infrastructure challenges. The organization seeks to understand the appropriate level of investment to manage risk and cost on the 69-kV system.

In recent years, wood poles used throughout much of the SRP grid have demonstrated higher-than-expected failure rates. This is due to weather events and wood-pole treatment techniques. Specifically, the SRP service area experiences frequent microbursts. These very high wind speeds can knock down the utility's gas-treated, 69-kV wood poles.

In 2017, SRP enlisted 1898 & Co., a part of Burns & McDonnell, to determine the optimal annual replacement rate of wood poles over the next 10 years. This required performing a thorough technical, risk and economic evaluation of SRP's nearly 7,000 wood poles.

#### Solution

We leveraged our Capital Asset Planning Solution (CAPS) to complete a benchmarking study. This covered the state of the industry relative to asset management and capital planning activities for aging infrastructure and weather events.

Then we developed a risk framework — including likelihood of failure and consequence of failure — and incorporated SRP's evaluation of pole strength into our asset health algorithm. The algorithm includes a





dynamic loading calculation based on an assessment of historical microburst weather data to calculate each pole's strength margin. This allowed us to calculate the risk profile for the nearly 7,000 wood poles.

Finally, we performed budget optimization on over 10 budget scenarios. These scenarios would guide SRP in establishing a long-term capital plan to manage risk with the 69-kV wood poles.

**Results**

Our study provided SRP with risk reduction benefits over the next 30 years, assuming different levels of investment over the next 10 years. This analysis

identified steady risk reduction with replacement of 100 to 275 poles per year, with an inflection point of minimal risk reduction above 275. While replacement of 275 poles per year would be optimal, the study determined that replacement rate of 225 to 250 poles per year achieved only slightly lower risk reduction efficiencies.

We also determined that replacing all poles between one substation and the next, rather than replacing poles in order of greatest risk, provided the best balance of risk reduction and investment. SRP is currently using the results of the study to target replacement of 250 wood poles annually over the next 10 years.

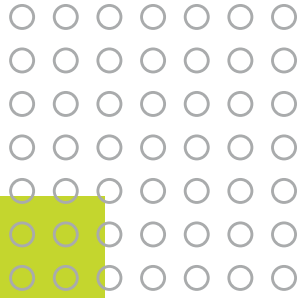
**About 1898 & Co.**

1898 & Co. is a business, technology and security solutions consultancy where experience and foresight come together to unlock lasting advancements. We innovate today to fuel your future growth, catalyzing insights that drive smarter decisions, improve performance and maximize value. As part of Burns & McDonnell, we draw on more than 120 years of deep and broad experience in complex industries as we envision and enable the future for our clients.



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