

Smarter Than Replacement: Proactive Cable Assessment as a Capital Strategy

Across North America, thousands of miles of systems are crossing the 30–40-year threshold—and many are already showing signs of deterioration. Meanwhile, utilities continue expanding their underground networks for grid resilience, wildfire mitigation, and urban growth, only to find that nearly 40% of newly installed systems contain manufacturing or installation defects that compromise long-term reliability.

Traditionally, utilities have had a binary choice: run cables to failure and replace them reactively or undertake costly replacements based solely on asset age and history. But both paths are expensive, operationally disruptive, and inefficient.

A third option—one that's both fiscally and technically superior—is now gaining wider adoption: high-sensitivity diagnostic cable assessments that match factory testing standards and enable targeted life extension. As the catalysts for cable life extension, these assessments also qualify as capital expenditures under FERC guidelines, shifting budget pressure from O&M to CAPEX while improving grid reliability.

Factory Level Insight, In the Field

Modern cable scanning technologies used in the assessments apply a 50/60Hz overvoltage to energized spans and detect partial discharge (PD)



activity with sensitivity as low as 5 picoCoulombs (pC)—the same threshold used in shielded factory labs. With advanced signal processing that filters out atmospheric electrical noise, these tools can pinpoint substandard components or damaged accessories with precision, even in noisy urban environments.

Unlike traditional very low frequency (VLF) or damped alternating current (AC) tests that may miss defects or produce ambiguous results, factory-grade field assessments provide usable insights that meet IEEE and ICEA standards. The accurate, actionable data from these assessments allow utilities to restore cable systems to like-new performance without the cost or complexity of full replacement or fluid injection that can't repair existing defects.

Capitalizable, Cost-Effective, and Reliable

The economic implications are big. In one large-scale deployment, CenterPoint Energy used proactive cable assessments to reduce loop restoration costs by 65% compared to full replacement and improved underground reliability by 98% after assessments and on-site mitigations. Even better, 75% of the utility's cable spans assessed required no immediate action, proving that many replacements would have been premature.

Because these assessments demonstrably extend useful life, they qualify as capital investments per FERC Docket AC09-27-000. This creates an opportunity for utilities to recast maintenance interventions as long-lived asset improvements—preserving O&M budgets while enhancing performance.

From Diagnostics to Forecasting

Beyond remediation, the data gathered from high-sensitivity cable assessments provides the groundwork for predictive maintenance. Using deep learning models trained on millions of defect signal waveforms, some utilities are now estimating remaining useful life with greater precision.



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These cable assessment models can categorize defects by severity, location, and progression risk, enabling planners to triage repairs, defer low-risk work, and prioritize the highest-impact interventions. This data-driven approach reduces reactive dispatches, lowers emergency restoration costs, and enables just-in-time asset management that aligns with workforce constraints.

A Scalable Solution for a Smarter Grid

Proactive cable assessment isn't just a technical solution—it's a strategic one. It supports utility goals around resilience, reliability, and cost optimization. It accelerates capital planning. And it equips engineers and operators with the information they need to extend the life of critical infrastructure.

For utilities navigating an era of rising demand, aging assets, and limited capital, field-based diagnostic cable testing offers a compelling path forward: extend life, enhance reliability, control costs, and capitalize smarter.



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