

# Hybrid Solution Saves St. Charles Utility More Than \$4 Million, Improves Reliability

## Highlight

- Rejuvenated 169,829 feet and replaced 50,127 feet of cable
- The utility saved \$4.3 million, or 66 percent of the original project estimate
- Rehabilitated subdivisions experienced a 96 percent reduction in failures

## Overview

Estimated costs for the St. Charles Municipal Electric Utility cable replacement needs came in at about \$6.6 million. St. Charles chose a solution comprised of 77 percent Novinium® cable rejuvenation and 28 percent cable replacement, saving \$4.3 million, or 66 percent of the original project estimate.

## The company and situation

The St. Charles Municipal Electric Utility, located along the Missouri River just outside of Chicago, Ill., already knew it faced a large volume of aging underground residential distribution (URD) cable. The utility decided to track cable failures in greater detail after experiencing a steady increase in outage rates. The resulting data clearly showed the problem subdivisions, which were not necessarily the ones with the oldest electric lines.



“

Our holistic approach to improving the reliability of our aging URD infrastructure has been extremely successful. We've restored the addressed population of cable to new, or like-new condition, while essentially eliminating cable failures—at 34 percent of the cost of replacing all of the cable. ”

– Stephen Shroba  
Senior Distribution Engineer  
St. Charles Municipal Electric Utility



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### Company

St. Charles Municipal Electric Utility

### Location

St. Charles, IL, USA

### Website

<http://www.stcharlesil.gov/departments/public-works/electric>

### Cable Sizes and Length

#2 and 1/0, 169,829 feet

### Method

Cablecure® 732 fluid with Improved Unsustained Pressure Rejuvenation (iUPR) and Sustained Pressure Rejuvenation (SPR) injection processes

## Evaluation process

St. Charles Utility Senior Distribution Engineer Stephen Shroba designed a strategic asset management plan to identify, prioritize, and then address the areas of the St. Charles system with the highest failure rates. As part of the plan, the utility developed a priority matrix that included the number of faults, randomized VLF tan delta testing, age of the cable, and each fault's impact on customers. The cost to replace all the affected cable was estimated at \$6.6 million and the project was going to be quite difficult logistically.

## Solution

Shroba recommended a comprehensive rehabilitation program comprised of cable rejuvenation and cable replacement as the best and most cost-efficient method combination to improve reliability and maximize their asset management investment. The project used Novinium's Improved Unsustained Pressure Rejuvenation (iUPR) and Sustained Pressure Rejuvenation (SPR) processes along with Cablecure® 732 fluid to provide the longest extension of cable life available, at the lowest risk. This hybrid approach injects the greatest number of segments and avoids the cost of digging difficult-to-access splices.

As Novinium began rehabilitating the highest prioritized subdivisions, each segment was tested using a TDR and categorized for either rejuvenation or replacement based on Novinium's injection criteria. Segments with blockages, or those that were otherwise identified as non-injectable, were replaced. Between 2009 and 2012, Novinium and St. Charles rejuvenated 169,829 feet and replaced 50,127 feet for a total of 219,956 feet of like-new cable.

## Results

Prior to this project, St. Charles recorded a total of 66 failures in the affected areas. In the first five years after completion, this cable population experienced only two failures. This was a 96 percent reduction in failures. The injected cable has been restored to as-new condition and is covered by a 40-year warranty.

The cost to replace all the addressed cable was estimated at \$6.6 million. Using a comprehensive approach of rejuvenation and replacement, St. Charles spent just \$2.3 million. This saved \$4.3 million, or 66 percent, and most importantly, achieved reliability results comparable to newly installed cable. Additionally, by using cable rejuvenation as the predominant solution, customer satisfaction remained high since most the landscape issues related to the cable replacement were significantly reduced.

To be proactive and eradicate cable faults, St. Charles has expanded their comprehensive rehabilitation program to include subdivisions that have never experienced a failure.

