

SOUTHWIRE'S NOVINIUM UNDERGROUND SERVICES MODULAR INJECTION COMPONENT (MIC) INCREASES REJUVENATION PRODUCTIVITY ON RADIAL SEGMENTS AT MVEA

COMPANY: MOUNTAIN VIEW ELECTRIC ASSOCIATION
LOCATION: FALCON, CO, USA
WEBSITE: [HTTP://WWW.MVEA.COOP/](http://www.mvea.coop/)
METHOD: SUSTAINED PRESSURE REJUVENATION (SPR)

HIGHLIGHTS

- *During the case study, the MIC was utilized by MVEA as a method for rejuvenating radial segments*
- *Crew productivity was improved when using the MIC to rejuvenate radial segments*
- *Full rejuvenation of radial segments was completed within the 2-hour outage window typically reserved for cable testing or assessment*

OVERVIEW

The sustained pressure rejuvenation (SPR) injection process requires a cable segment to be deenergized for the duration of injection. On radial segments, this requires taking ratepayers out of service. The duration of the outage depends on the segment length. The duration and variability in these outages can make scheduling challenging. MVEA was not able to efficiently address their radial sections, which represent 10% of their system, because of this uncertainty.

THE COMPANY AND THE SITUATION

Mountain View Electric Association (MVEA), an electric cooperative in Falcon, Colorado, serves more than 50,000 members across 5,000 square miles east of Colorado Springs, using 600 miles of aging unjacketed XLPE URD cable. SPR injections have been performed on MVEA's system since 2011. In that time, more than 1400 individual segments were injected, a total of more than 800,000 conductor feet. MVEA selected the SPR process because of the long cable life extension it offers.

THE MIC

The Modular Injection Component (MIC) is the first 200A cable accessory designed specifically for the SPR injection of energized, medium-voltage cables. The MIC is installed below a standard-length 200amp elbow to create a termination capable of injection at pressure up to 200psi, while energized at up to 28kV. The MIC is a patented device that was developed as a collaboration between Southwire's Novinium Underground Services and Richards Manufacturing.

MIC is rated applicable to portions of:

- IEEE-386- ANSI C119.4
Craftwork is completed:
- To IEEE 1816, using Southwire's Novinium Underground Services Craftwork

RESULTS

After a single trial of the MIC in a loop application conducted in October 2019, MVEA line crews recognized the benefits of using the MIC injection system to address radial segments. A second trial was performed to showcase the MIC on radial segments. Previously when using the SPR process, a two-hour outage would be scheduled on a segment for diagnostic testing. If the segment was a candidate for injection, the outage would be extended if possible, or a second longer outage would be scheduled for injection. If the segment is a candidate for injection using the MIC, diagnostic testing, craftwork and the beginning of the injection, can be completed during the original two-hour outage. The segment is then reenergized while the injection is ongoing, and the equipment is closed, securing the terminations overnight. On the



Figure 1: Checking measurements against MIC craftwork template during vault installation.



Figure 2: MIC Injection in a low-profile transformer

Southwire's Novinium Underground Services would like to acknowledge MVEA's support in testing new advancements in cable injection technology.



following morning, injection is completed during a brief return to remove injection equipment. The improvement in outage consistency allows for applicable segments to be reliably scheduled for injection. Three two-hour outages can be easily scheduled into an eight-hour workday (or four outages in a ten-hour day), allowing projects to stay on schedule. Productivity increases allow for more segments to be addressed, shortening project durations and reducing utility overhead costs.



Figure 3: Completing MIC injection in a vault

SUMMARY

Using the MIC injection system, MVEA was able to inject radial segments, realizing the superior cable reliability of SPR injection, while reducing outage duration and frequency. Unattended energized injections using MIC allow a crew to address more segments, improving productivity.

- Crew productivity was improved when rejuvenating radial segments.
- Power was restored to a rate payer within the scheduled 2-hour outage window.
- Less disruptive to rate payers than cable replacement or longer outages for de-energized segments.
- The same extended reliability of SPR injection, an improvement over iUPR injection times.