



BRINGING 50 YEAR OLD POWER CABLE TECHNOLOGY RIGHT UP TO DATE

TE Connectivity's (TE) engineering team helped the utility SP Energy Networks to remove the need for gas compression cable assets on the power network, by designing a customized end-to-end solution for their aging paper cables, in a short period of time.

The Challenge

Paper Insulated Lead Covered (PILC) cables were installed on a regular basis - including 275 kV cables with gas compression - in order to provide electricity to the city of Glasgow over 50 years ago.

To ensure the security of supply on the distribution network, SP Energy Networks initiated a strategic investment program to improve the reliability of their assets by innovating a system for fault repairs and potential deviations. This initiative included the elimination of one remaining 275 kV degassed circuit operating as an interconnector on the distribution network.

SP Energy Networks decided to work together with TE experts to engineer an innovative and complete customized cable joint solution to connect modern polymeric cables to legacy paper cables, within three months.

Featured:



Country:

Scotland

Industry:

Power Utility

Challenges:

Innovating type tested cable joints that deliver a safe, cost-effective and reliable solution for fault repairs.

Solutions:

- TE's Raychem Heat Shrink Tubing WCSM
- HV Connectors
- 72 kV Sleeves
- On-site Installation Training

Customer Advantage:

A highly sophisticated cable jointing solution, designed specifically to meet exacting client requirements.

FROM DESIGN, TESTING TO INSTALLATION TRAINING

The Solution

SP Energy Networks asked TE's highly experienced engineers to design a joint that could be used as a transition between the PILC cable and newly installed polymeric cable - and also provided a 4 meter sample for the team to assess. Although the cable was rated at 275 kV, it had been de-gassed and de-rated to 33 kV, but with the same physical dimensions and size of a 275 kV cable - enabling TE's engineers to use it as a base for their design work.

- Utilizing TE's Product Suite and Engineering Expertise

The ultimate solution was made possible thanks not only to the expertise of the TE's engineering team, but also to TE's broad portfolio - utilizing the full TE's product suite in order to build a bespoke joint, which would transition from the de-rated 275 kV PILC cable to a standard 630 mm² polymeric cable. This included TE's Raychem heat shrink tubing WCSM, high voltage connectors, 72 kV sleeves, earthing equipment and plastic molding.

- Extensive Testing

Once the design of the new cable joint was completed, TE's engineers worked together with SP Energy Networks engineers and jointers, to review the joint and also to perform extensive testing in TE's laboratories to ensure reliability. The joint successfully passed all of the tests, and a full set of test reports were provided to SP Energy Networks.

- Installation Training

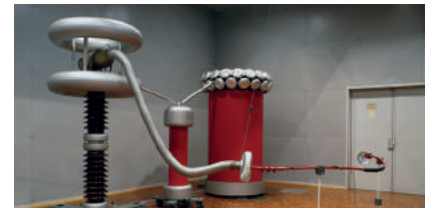
To allow for a smooth integration of the new cable joint, and to avoid any outages due to installation error, TE's engineers produced detailed installation instructions. They also trained the utility jointing instructors, to show them how to make the assembly, as well as attending training events with SP Energy Networks to offer further support. In total, 25 pieces of the bespoke cable joint were ordered, to ensure that the risk of any future outages could be swiftly addressed.



Sample of the 50 year old PILC oil paper cable.



TE's Raychem heat shrink tubing WCSM, High Voltage connectors.



Insights of TE's lab where the testing was performed.

TOTAL SOLUTION



The Outcome

TE was able to provide SP Energy Networks with a complete customized solution for fault repairs within a very short time period. The new cable joint was designed, tested and configured within just three months – which also included training the jointer team, in order to reduce the risk of installation errors.

The ultimate outcome of this project is that SP Energy Networks now has a tailored solution in case outages with the 275 kV gas compression cables occur, ensuring transmission system stability and security of supply to the city. With this project, TE demonstrates the capability to connect modern polymeric cables to aging paper insulated cables, by providing a total solution.

“TE CONNECTIVITY PROVIDED US WITH EXCELLENT SUPPORT AND CUSTOMER SERVICE. THEIR ENGINEERING TEAM APPLIED MODERN TECHNOLOGIES AND COMPONENTS TO DEVELOP, IN A SHORT PERIOD OF TIME, A TAILORED SOLUTION TO CONNECT OUR NEW POLYMERIC CABLES TO OUR LEGACY PAPER CABLES. SUPPORTING US WITH INSTALLATION TRAININGS ENSURED A SMOOTH INTEGRATION OF THE CABLE JOINTS.”

Clark Sherry,
Senior standards and policy engineer at SP Energy Networks.

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