Rejuvenating aging power cables

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Siemens' Smart Grid Division is offering a new service to extend the lifespan of insulated medium voltage cables. The process injects a rejuvenation fluid into a cable under constant pressure. The process increases the dielectric strength of the cable and returns its performance to a like-new condition. Rejuvenated cables can then be utilized for many more decades. Credit: Novinium

A special restoration service from Siemens extends the service life of power cables. After this treatment, older cables can remain in service for several more decades. As a result, network operators can avoid the

sizable investments that would be necessary for a complete replacement. In other words, cable replacement can be postponed for a longer period of time.

Siemens uses a process called Califex that was patented by Novinium, a contractual partner in the U.S. The experts at Siemens' Smart Grid division are initially offering the Califex service to power companies, municipal utility operators, and industrial companies in Germany, Sweden, and Norway. This service is suitable for power cables that have plastic insulation.

Many medium-voltage cables that were laid in the 1970s and 1980s are gradually reaching the end of their maximum service life. In order to prevent disruptions in the medium-voltage grid due to cable failure, older cables are often replaced before they have reached the end of their service life. The new cable restoration service from Siemens offers an alternative that is much less expensive than complete cable replacement.

For this life-extending process, maintenance technicians inject a special fluid into the cable under constant pressure. This procedure increases the dielectric strength of the insulation for a long period of time. According to Siemens' partner Novinium, the fluids that are used are non-flammable or flame-retardant, non-toxic, and non-carcinogenic. Different fluids can be used depending on the prevailing temperatures and weather conditions of an individual cable's location. In other words, the treatment can be adjusted in response to local conditions.

An injection adaptor is fitted to one end of an aging cable, at the connection point. This adaptor is used for the introduction of the fluid. The special fluid is pumped out of its holding tank and injected into the spaces between the cable's conductors. This pumping continues until the fluid flows out of the other end of the cable. The cable is then immediately ready to go back into service. It takes about seven days for

the silicone-based fluid mixture to diffuse into the insulation and for the cable's dielectric strength to once again reach its previous value. Compared to replacement, this procedure offers tremendous savings in terms of time, and for continuous stretches of cable it often only requires a few hours.

Until the 1990s, Siemens was one of the world's largest cable manufacturers. Many experienced employees are still with the company, and today these colleagues are specialists at the Smart Grid division. These energy-efficient and environmentally friendly solutions for intelligent power grids are part of the Siemens environmental portfolio. Green products and solutions account for approximately 43 percent of the company's sales. This makes Siemens one of the world's largest suppliers of environmentally friendly technology.

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