

Case Study

Circuit Owner: Hess Port Reading Refinery, Perth Amboy, NJ
Cable: 5 kV, EPR/XLPE, 350/500 MCM cable circuits
Problem: The refinery feeders had experienced two trips.
Solution: Cable Rejuvenation—Sustained Pressure Rejuvenation (SPR) methods were utilized to extend the life of these feeders to quickly improve the reliability of the refinery.

Hess Corporation is a global integrated energy company headquartered in New York City engaged in the exploration and production of crude oil and gas. The Hess Port Reading refinery's fluid catalytic cracking unit is capable of producing 70,000 barrels per day of some of the cleanest-burning gasoline available. Its tank field can store up to six million barrels, and its terminal can transport product by truck, ship, barge, rail and pipeline. The refinery was established in 1958 and many of the medium voltage cables are over 30 years old.

Prior to the Novinium injection project, Hess refinery had experienced two ground fault current trips. The trips caused the main feed to the refinery to trip. These outages, lasting up to 12 hours, cost the refinery millions of dollars in downtime.

Cable Injection Project: A project kickoff meeting was held to walk the project and define each of the accessories required, so that they could be ordered in advance. After an initial one day delay waiting for circuit availability, the project started. One 350 MCM EPR and four 500 MCM XLPE 3-phase 5 kV cable circuits, which were direct buried and encased in concrete, were injected in a period of four days. The project was completed ahead of the scheduled startup. There were challenges removing the old heat shrink termination kits that had been in place for a very long time.

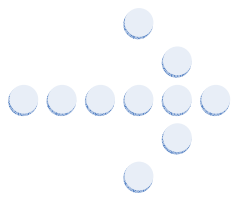


The Cable Injection Process

After cables are de-energized and grounded, the old terminations are removed. If there is no slack, a lug splitter is used to remove the old lugs.

A template is used to determine the proper cutback, and each cable end is prepared as shown in the picture above. Then an injection adaptor (IA) is installed on the cable. The IA seals the end of the cable, keeps the fluid from touching the terminations or splices, and prevents any future moisture from getting into the cables, even if there is a flood.

Once the IAs are installed on each cable
(continued on next page)



Case Study (page 2)

Refinery Injection Project (continued)

Ghanshyam (GR) Patel, process control engineer, was in charge of the project. GR said, "The Novinium team was very professional and the craft work was excellent. On this job, we used a mix of Novinium technicians and local craft labor. For the next project, we will use Novinium on a turnkey basis, because of their professional approach, knowledge, and excellent craft skills. They had the right tools, parts, and templates, and got the job done very quickly.

"I liked the fact that you can inject one end of the cable and the fluid came out the other. If we would have had to access the cable along its path, it would have been extremely difficult.

"The job was completed ahead of schedule including one day's delay, which was not Novinium's fault.

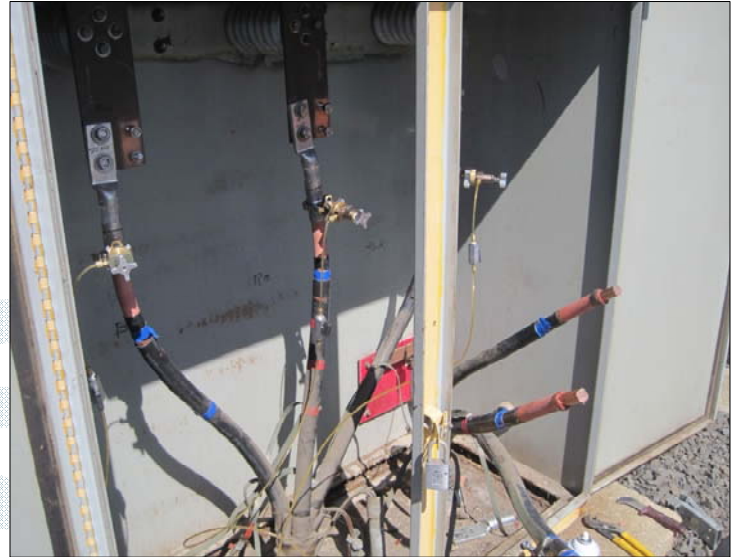
"Because of the concrete encasement of these cables, the cost of replacement vs. injection was 30 to 1.

"We have the B1 feeder that we would like Novinium to inject next. We will plan more time in our next turnaround for more extensive injection to complete the remainder of our 5 kV feeders."

Rejuvenation of medium voltage takes about 1/3 the amount of time as cable replacement.

Refineries have a large cost of downtime. Any extended outage can cost millions of dollars. Aging cables can cause these types of outages.

Rejuvenation is like buying life insurance on your cable reliability, and it is easy to do.



Injection Process (continued)

end, an injection valve is mounted on the IA (above picture) and is connected to the pressurized tank (below picture). The fluid flows from one end of the cable to the other in just a couple of hours. Both IAs are then sealed, and new termination kits are installed. The cable is reconnected and re-energized. Within 7 days the dielectric strength of the cable has improved to the point where it is unlikely to fail.

After injection, these cables will last another 40 years.

