

Case Study 21

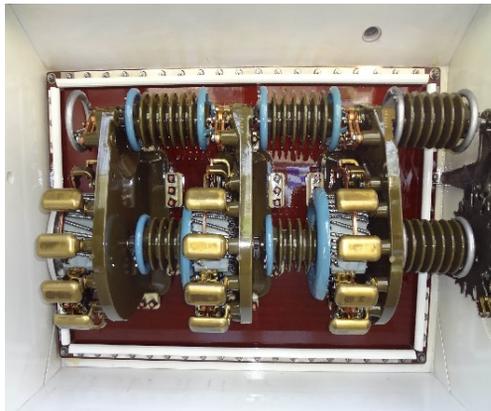
Dielectric Oil Filtration for Transformers

Background

In the PowerGen industry, transformers are key to transmission and distribution of electricity by converting voltage to meet demand and safety requirements. Step-up transformers increase voltage from power plant generators so electric current can travel long distances economically without generating heat. Step-down transformers reduce voltage from long-distance transmission lines for safe commercial and residential use. These transformers are typically filled with dielectric oil to cool and insulate the internal components and windings from each other and ambient surroundings. Moisture and solids contamination in dielectric oil can effect the operational cost and life cycle of transformers and can even cause catastrophic failure. Northeast Filter was contacted by a major electric utility to work with their maintenance group on developing a strategy to address high OPEX of 50 older transformers associated with excessive contact wear which they suspected was related to contaminated dielectric oil.

Solution

Fluid analysis from transformers located in three different locations showed that the presence of moisture, particles and oxidation by-products had caused a dielectric breakdown of the oil which, in turn, was causing arcing in the transformers. Northeast Filter recommended dedicated, stationary filter systems with moisture sorbent/particle retention elements for each of the transformers. The filters could be run during off-peak hours to minimize electrical OPEX and labor demand. After a successful trial with a rental portable unit for proof of concept, Northeast Filter sold 50 customized filter systems with each system installed as a dedicated kidney loop on each transformer. These 50 filters were installed in 1994 and due to their success, an additional 25 more filters were installed from 1996 through 2000. The filters and transformers are all still running efficiently today.



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