AFRY

Modular predictive maintenance in high voltage transformers

Designing a modular and reliable predictive maintenance model to optimize the maintenance plan of its HV transformers

INDUSTRIAL DATA ANALYTICS

This is the process of collecting, analyzing and using plant data to harness the hidden value. Tools like e-DAP are capable of modelling a physical phenomenon on the basis of data collected over time. The insight gained helps improve operational efficiency, optimize process, and plan maintenance ahead of time.

SITUATION & CHALLENGE

— The client recorded the oil winding temperature and transformer load every 5 minutes for five years.

— It's uncertain how the client can link this data to the transformer's aging and adopt a comprehensive condition-based maintenance approach.

SERVICE & APPROACH

— E-DAP was used to build a predictive maintenance model for transformer aging.

— 40 years of maintenance data, both frequent and rare, were analyzed.

— Client inspection results were used to detect oil degradation patterns in e-DAP.

— Paper polymerization was identified as the primary degradation cause for the transformer's lifespan.

— Analytical modeling was combined with machine learning to predict health trends.

E-DAP: the *end-to-end* data platform

A cloud-hosted infrastructure for the treatment of plant data: from IoT sensing, through engineering, dashboarding, ML/AI, digital twinning, to insight

IMPACT & ADDED VALUE

— A license is held for a modular and reliable predictive maintenance model that predicts the remaining useful life of HV transformers and optimizes the maintenance plan.

— There's capability to conduct scenario analysis, adjusting temperature, load, and oil cleaning frequency, and assess their impact on the asset health index update.
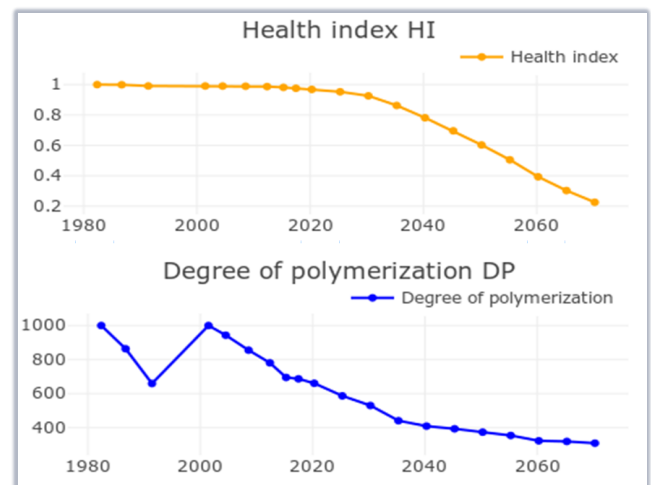
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