

Procedure

Introduction

Retrofilling is the replacement of the dielectric fluid in a transformer.

Retrofilling with Paryol ELECTRA 7426® brings the following benefits: reduction of fire risk, less paper degradation with an extension of the transformer's lifetime and no environmental impact.

In the retrofilling process emptying and cleaning do not completely remove the exhausted mineral oil that will continue to be released from the insulating paper into the new dielectric, Paryol ELECTRA 7426® in this case behaves as a solvent.

Although mineral oil is completely miscible and compatible with Paryol ELECTRA 7426® (see TG2), if the residual mineral oil concentration is above 5% by volume, the fire point of the resulting mixed medium could fall below 300 °C.

The correct application of the following retrofilling procedure will help reaching mineral oil concentrations in the new Paryol ELECTRA 7426® based dielectric not exceeding 5%.



Activities before retrofilling - inspection

1. Read the transformer's maintenance manual and take all mandatory safety precautions (see disclaimer at bottom)
2. Inspect the transformer (oil leaks, oil level, oil temperature etc.)
3. Verify the electrical functioning of the transformer with Low Voltage tests (insulation resistance, windings resistance, voltage ratio, etc.)
4. Sample the old dielectric fluid and analyze the following parameters: color and appearance, PCB, corrosive sulphur, DBDS, DGA, breakdown voltage, acidity, NAS class, moisture, $\tan \delta$ (@25 and @90 °C)
5. Take a set of new gaskets for the transformer, if necessary
6. Order spare parts, if necessary
7. Be ready to arrange used oil disposal according to local regulations
8. Plan in advance the delivery of Paryol ELECTRA 7426®
9. Assist our staff on-site with proper equipment (energy supply, lifting and handling)

Retrofilling step by step

1. Always observe safety requirements, precautions, codes, and respect regulations in force
2. Empty the transformer by removing the used dielectric fluid
3. Completely drain the residual oil
4. Flush the active parts with warm (ca. 60 °C) new Paryol ELECTRA 7426® (5-10% of the transformer volume)
5. Drain the flushing new oil, waiting the necessary time for complete dripping
6. Transfer the waste oil in a safe place and arrange disposal
7. Replace the seals with the new set if necessary
8. Fill the transformer with Paryol ELECTRA 7426®
9. Perform treatment of the new fluid and of the active parts of the transformers through closed-loop system (filtration, de-gassing, de-hydrating)
10. It is recommended to wait 24 h before applying power to the transformer unit. This interval helps filling the porous materials that may have remained dry during part of the procedure
11. Perform end-of-treatment analysis: viscosity (@40 and @100 °C), $\tan \delta$ (@25 and @90 °C), color and appearance, PCB, corrosive sulphur, DBDS, DGA, breakdown voltage, acidity, NAS class, moisture
12. Perform routine electric tests before energizing the transformer unit

Disclaimer

This document applies as a general guidance for the retrofilling of transformers and does not convey safety informations. Refer to original manufacturer's operation and maintenance guides appropriate for each transformer before beginning the retrofilling process.

All applicable safety codes and procedures must be followed.

A&A Fratelli Parodi Spa shall not be held liable for any damage or injury resulting from incorrect performing of the procedure reported therein.



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