

CASE STUDY



PROJECT: 132 kV Hydro Power Retrofill | Nordic Region

ESTER TYPE: MIDEL 7131 synthetic ester

PURPOSE: Retrofilling for environmental protection

[OVERVIEW]

A Nordic national power company, operating multiple hydro power stations, has a strong commitment to environmental stewardship, reliability and safety in its operations.

One of these hydro stations came on-line in 1959, with an installed generator capacity of 27 MW. Inside the facility, its mineral oil-filled 132 kV, 40 MVA electrical transformer's job is to convert the low voltage from the hydro generators to high voltage. This converted power supply from the transformer then connects to the grid, where it is distributed for domestic and industrial use. While the transformer was operating satisfactorily, concern was expressed about the potential for environmental damage if there was a mineral oil leak.

After in-depth consultation with the MIDEL technical team, both the utility and transformer manufacturer agreed to retrofilling the transformer - replacing the existing mineral oil insulating material with MIDEL ester fluid.

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[SITUATION]

The decision to refill the transformer was not taken lightly, but the knowledge that refilling is a simple, cost effective and proven method of enhancing transformer performance and reducing asset risk was instrumental in the procedure going ahead.

Simple – can be quickly done on-site with existing equipment

Upgrades the transformer– life extension, robustness, moisture tolerance

Proven - many thousands of transformers refilled since first performed in the 1970s

MIDEL 7131 synthetic ester transformer fluid was chosen for the refilling because of its acknowledged performance since it was introduced in the 1970s; it is fire safe, biodegradable, non-toxic and is the preferred insulating fluid for mainstream applications and for transformers located in challenging environments.

Dr. Attila Gyore, Senior Engineer in the MIDEL team, commented “Refilling consistently delivers tangible solutions to transformer operators. For projects involving a unit above 33 kV, we always work closely with the engineering team on site, performing a thorough technical review to ensure the transformer is a viable candidate for refilling.”

[RESULT]

After the refilling was complete, the utility sent a sample of MIDEL 7131 to M&I Materials for testing. The sample received was tested for water content, acid value, colour, breakdown voltage, flash and fire point to assess its condition.

The results for the refilled MIDEL 7131 sample were well within the specification limits for in-service synthetic ester (IEC 61203) indicating that the fluid is in good condition.

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Dr. Attila Gyore
Senior Engineer, MIDEL

The use of MIDEL ester fluids in this project supports the following UN Sustainable Development Goals:

