

CASE STUDY



PROJECT: 110 kV retrofill at mine site | Manitoba, Canada

ESTER TYPE: MIDEL 7131 synthetic ester fluid

PURPOSE: Increase fire safety and environmental protection



[OVERVIEW]

A diversified mining company producing gold, copper, zinc and silver by-products, and with operations in North and South America, conducted a technical review of the electrical infrastructure at its Stall Mill Concentrator facility in Manitoba, Canada.

It discovered that two transformers (10MVA, 110 kV, manufactured in 1978) had developed several moderate leaks involving gasketed and sealed components, causing a minor loss of oil but creating concern for the potential environmental hazard to the surrounding area. The units had been filled with mineral oil and were confirmed to have 18 ppm and 19 ppm PCB content.

Insurance audits also raised concerns about the proximity of the two units to each other in the event of a catastrophic failure. Building a blast wall between the units or the installation of a fire suppression system was considered - both expensive options.

Dynamo, a MIDEL Service Partner, was consulted on the situation; they recommended an alternative solution - retrofilling the units with MIDEL 7131 synthetic ester transformer insulating fluid. Because of the unit's 110 kV rating, the MIDEL technical team consulted closely with all parties to ensure the transformer was a viable candidate for retrofilling.

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[SITUATION]

As a responsible mine operator, the company was keen to deploy a sustainable solution to its aging transformer issue. Accordingly, Dynamo was retained to repair leaking components and perform fluid retrofills of the units. Dynamo's first step was to complete detailed engineering analyses of the units to confirm they were viable candidates for retrofilling. Once this step was complete, Dynamo worked quickly with the retrofilling operation.

Kyle Solie, Key Account Manager at Dynamo commented "MIDEL 7131 synthetic ester fluid was used because it has a fire point and flash point nearly double that of mineral-based oil, removing the requirement for blast walls or external fire suppression systems. Deploying MIDEL 7131 also removes the volatility and risk to nearby equipment, infrastructure, and personnel in the event of a catastrophic failure." The remote, logistically challenging location of the site was also a consideration - transformers in such environments need to be reliable, safe and robust; MIDEL 7131 directly helps transformers meet these criteria.

In addition, MIDEL 7131 can extend the life of transformers (an advantage in this case since future planning for the facility indicated that plant operation was expected to last another fifteen to twenty years, thus requiring the transformers to be reliable for the duration of the remaining plant life). Due to its inherent properties (high moisture tolerance and resistance to oxidization), MIDEL 7131 synthetic ester fluid can often prevent failures and ultimately extend the life of the equipment.

Lastly, MIDEL 7131 is readily biodegradable (a property not found in mineral oil) - presenting a much lower risk to the local environment if spillage occurs. It also has a much lower pour point, making it an attractive proposition in cold weather applications - a definite advantage considering the location of the transformers.

[RESULT]

The entire retrofill process on the two transformers (from entering to leaving the site) was successfully accomplished over a 2-week period. Comprehensive testing was carried out post-retrofill and the transformers were returned to service.

The project again demonstrates that the use of MIDEL 7131 synthetic ester fluid is increasing globally in retrofill applications. Using this fluid demonstrably improves fire safety, prevents environmental contamination, and extends transformer life. Clearly, such risk reduction measures save lives and money.

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Kyle Solie, A.Sc.T.
Manager - Key Accounts, Dynamo (MIDEL Service Partner)

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

