

# CASE STUDY



**PROJECT:** Vattenfall 238kV transformer | Sweden

**ESTER TYPE:** MIDEL 7131 synthetic ester

**PURPOSE:** Environmental protection and fire safety

## [ OVERVIEW ]

In 2002 Vattenfall AB identified a need for a new transformer for the Stalon underground hydropower station, located between Lake Malgomaj and Lake Kultsjön by the Ångermanälven River in northern Sweden. It was decided that a mineral oil transformer would not be appropriate in this instance; firstly, the 238kV transformer was to be placed underground, making fire safety a critical requirement, secondly, and just as importantly, the power station was located in an environmentally sensitive area, where spillage of mineral oil could cause serious and long lasting damage.

When the transformer was put out for tender VA Tech (now Siemens Austria) offered the option of using MIDEL 7131 as the cooling fluid rather than mineral oil because it is fire safe and readily biodegradable - thus addressing the customer's key concerns with one solution.



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## [ SITUATION ]

The MIDEL team was involved in the early stages of the tendering process during 2003, supporting VA Tech by providing technical information related to MIDEL 7131 synthetic ester fluid.

Once Vattenfall was satisfied that the MIDEL option was viable for the unit's voltage level, the contract for the transformer was awarded to VA Tech. The OEM commenced constructing a world first large generator step up transformer, which was MIDEL filled, and the transformer was successfully factory tested in April 2004. Shipping the transformer to site presented added complications; due to weight restrictions on Sweden's roads, the transformer had to be drained and refilled in place.

## [ RESULT ]

Despite the more complicated installation process VA Tech successfully installed the transformer, filled it with MIDEL and the transformer began operation in June 2004.

Since this time the transformer has run without incident and the MIDEL team has continued to have a close relationship with both Vattenfall AB and Siemens Austria. For example, the MIDEL technical team has provided support with analyzing the MIDEL fluid to check that the transformer is in good working order.

Following the success of this unit Vattenfall AB has installed several more MIDEL filled power transformers on their network, including a 200MVA unit.

When the transformer was put out for tender, VA Tech (now Siemens Austria) offered the option of using MIDEL 7131 as the cooling fluid rather than mineral oil because it is fire safe and readily biodegradable - thus addressing the customer's key concerns with one solution.

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

