

CASE STUDY



PROJECT: Sabine Power Station | Texas, USA
ESTER TYPE: MIDEL eN 1215 natural ester - soybean
PURPOSE: Safeguard assets and environmental protection



[OVERVIEW]

Entergy is a Fortune 500 company headquartered in New Orleans, serving 3 million customers across Arkansas, Louisiana, Mississippi and Texas. Entergy has a vision of creating a cleaner, more resilient energy future with a diverse power generation portfolio, including increasingly carbon-free energy sources.

Given such a commitment, the company's decision to deploy a natural ester transformer fluid in one of its important power stations should not be surprising.

At Entergy's Sabine Power Station in Orange, Texas, eight transformers (manufactured in 1984) were in operation but scheduled to be taken out of service by 2024. The dielectric fluid used in the transformers was Wecosol, a transformer grade of tetrachloroethylene (sometimes called perchloroethylene). While this fluid was initially introduced as a replacement option for PCBs (polychlorinated biphenyl), after some years of service the EPA identified serious toxicity issues with the fluid. Since then companies like Entergy, committed to environmental stewardship, have been keen to replace this fluid with more effective, biodegradable alternatives.



CASE STUDY



[SITUATION]

Entergy had eight Westinghouse transformers at the Sabine site, each rated at 750 KVA and all scheduled to be taken out of service by 2024. However, leaks were discovered in two of the transformers during routine maintenance in May 2022 by Southern Power Systems, a substation service provider headquartered in Baton Rouge, LA.

Due to the environmental hazards posed by the Wecosol liquid, Entergy's Internal Safety Group instructed that all eight of the transformers be drained, cleaned and refilled immediately. Entergy hired Reladyne LLC to drain and clean the transformers and dispose of the toxic insulating liquid. Southern Power Systems was contracted to refill the transformers with natural ester fluid.

Entergy originally specified Cargill FR3 as the natural ester liquid for the retrofills but chose to use MIDEL eN 1215 soy-based natural ester instead. Entergy made this decision to switch to MIDEL eN 1215 after reviewing the technical specifications and references, and after consultation with Southern Power Systems.

Being a MIDEL Service Partner, Southern Power Systems had comprehensive experience of working with MIDEL ester fluids. In addition, the company could count on a high degree of technical support provided by MIDEL engineers.

[RESULT]

The refilling operation took place during the summer of 2022. The tetrachloroethylene liquid was drained and disposed of safely. Southern Power Systems then followed the correct procedures to fill the units with MIDEL eN 1204. The fluid, manufactured in the US and already well-established in the electric power sector, is extremely fire-safe (K class), readily biodegradable, moisture tolerant and can extend the life of a transformer's internal paper insulation – qualities absent from insulating fluids such as mineral oil.

MIDEL Service Partners are electrical service companies that have been carefully vetted by M&I Materials (manufacturer of MIDEL fluids) and have passed a course of technical instruction on the chemistry, background and use of MIDEL ester liquids.

The MIDEL Service Partner initiative was developed to build a network of experienced oil service and maintenance companies to perform the refilling of electricity transformers. This process upgrades the transformer and removes the need to purchase an expensive new unit.

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

