IEEE PES Transformers Committee
Spring 2024 Meeting
Vancouver, BC, Canada

Dry-Type Pole-Mounted Transformers: Innovative Solution to Increase Safety in Overhead Distribution Networks

— Technical Presentation —
Thursday, March 14, 2024

By André Moreno, Tim-Felix Mai and Cassandra Wadsten

1. Abstract

For a long time, pole-mounted liquid-immersed transformers have been the preferred solution for supplying appropriate voltage levels for electricity consumption by endusers in distribution systems around the world. However, despite being an established product, manufacturers and utilities are confronted with environmental, personal safety and maintenance challenges. These challenges arise from liquid fluids used as an insulation medium in the transformers.

This technical presentation will demonstrate a new type of single-phase dry-type pole-mounted transformer. This product, commercially known as CAREPOLE, has been developed by Siemens Energy. It utilizes a self-extinguishing cycloaliphatic epoxy resin system which not only insulates the windings, but also provides outdoor protection for the cast coils.

Due to the absence of oil, dry-type pole-mounted transformers are an option for eliminating explosion risks, reducing fire hazards, and preventing contamination from insulation liquids, especially when safety is paramount. Additionally, the goal is to enhance the performance of the distribution network and reduce costs associated with installation and maintenance.

Being at the forefront in search of technological solutions, Consumers Energy will share its experience and expectations about this new technology.

2. Learning Objectives

This tutorial offers opportunities to gain experience in the following areas:

- Evaluating the technical viability between oil-immersed and dry-type transformers.
- Defining the insulation system for pole-mounted dry-type transformers.
- Conducting design and validation tests.
- Experience on field tests.

3. Learning Outcomes

By attending this tutorial, participants will gain an understanding of the following:

- Primary challenges involved in transitioning from pole-mounted oil-immersed to dry-type transformers.
- How to implement the insulation system to optimize distances in dry-type transformers.
- Benefits and drawbacks of using dry-type transformers.
- Evaluation and proposals for adaptions to the standards for pole-mounted dry-type transformers.
- Use case and technology evaluation.

4. Presenters' Biographies

André Moreno is the global head of research and development for dry-type transformers of Siemens Energy's Distribution Transformer group. He started in the transformer business more than 20 years ago and held several positions in the electrical and mechanical design engineering departments.

Tim-Felix Mai is the head of research and development for dry-type transformers at Siemens Energy's factory in Kirchheim unter Teck, Germany. He holds a bachelor's degree in electrical engineering and has over 15 years of experience in the field of dry-type transformers.

Cassandra Wadsten is the manager of standards for Consumers Energy in Jackson, Michigan. She holds a bachelor's degree in electrical engineering and has over 20 years of experience in the standards department with Consumers Energy.