IEEE/PES Transformers Committee
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Ester-based Transformer Fluids

-- Panel Discussion, Tuesday, October 7, 4:45 p.m. --

by Patrick McShane, T. V. Oommen, and Charles Tanger

1. Abstract

Recent emphasis on environmentally preferable fluids triggered the development of ester-based dielectric coolants for use in transformers. The presentations cover the development of vegetable oil ester fluids, and their commercial use.

2. Learning Objectives

These ester-based fluids are new, and are significantly different from the commonly-used fluids. The new fluid and its properties and performance will be discussed.

Specific topics include:

- What are ester fluids?
- Use in transformers
- Development
- Performance
- Enhanced insulation thermal life
- Commercial availability

3. Learning Outcomes

Attendees will learn about environmentally-friendly transformer fluids that are currently in use:

- Basic information on ester fluids
- Challenges in development
- Acceptance tests
- Performance in transformers
- Enhanced Insulation thermal life
- Current status with EPA regulations regarding spills

4. Presenter's Biographies

C. Patrick McShane: Mr. McShane received his BS in Electrical Engineering from Marquette University in 1970, and an MS in Engineering Management from the Milwaukee School of Engineering in 1998. Currently the Product Line Manager for Dielectric Fluids at Cooper Power Systems Transformer Products, his employment experience includes International Area Manager for RTE Corp. and Regional Technical Director for the State of Sao Paulo (Brazil) Rural Electrification Program. His professional activities include USA Delegate IEC TC99, IEC TC99 Liaison to TC64, IEC TC89 Expert Delegate, Chair ASTM WG D-5222, and WG Chair IEEE TC Dielectric Fluids Subcommittee C57.121. Several of his proposals have been adopted by USA Codes and Standards (NEC, NESC, FMRC). He has presented papers at domestic and international engineering conferences including IEEE, EPRI, Doble, and CIRED. He is the principal inventor of two US patents relating to dielectric fluids.

Dr. T. V. Oommen: Dr. Oommen is presently Consultant on electrical insulation related to transformers, and during his 24 year career as R&D Engineer/Scientist with Westinghouse Electric and ABB Power Co. he was involved in a variety of transformer related research in the areas of gas and bubble generation, moisture effects, particle contamination, static electrification and insulation life. His developmental efforts included on-line moisture sensors, mini-static tester, and vegetable-oil based transformer fluid. He has published about seventy technical papers and he conducts seminars on insulation topics. He is a Senior Member of IEEE, and member of IEEE/PES Transformers Committee Subcommittees on Insulating Fluids and Insulation Life.

Charles Tanger: Mr. Tanger is a Staff Scientist with Cargill Industrial Oils and Lubricants. His responsibilities include product and process development for vegetable oil based products in industrial applications, including transformer oils, lubricants, coatings, and polymers. He is a member of the American Chemical Society and ASTM Committee D27 on Insulating Fluids. Prior to joining Cargill, Charles was a Senior R&D Manager with Ethyl Petroleum Additives. He received a B.S. in Chemistry from Wisconsin State University - Eau Claire, and a Ph.D in Organic Chemistry from Iowa State University.