



Guide for Application of Monitoring Equipment to Liquid-Immersed Transformers and Components C57.143

— Technical Presentation —
Thursday, March 27

Presented by Claude Beauchemin, Jeff Benach, Donald Chu, Tony Pink and Brian Sparling

Abstract

The tutorial will cover five topics:

- Overview of issues that led to the development of this guide, including a review of the scope and purpose
- Review of the need for surveillance of transformers and components
- Synopsis of monitored parameters
- Monitoring systems and components
- Discussion of a cost / benefit analysis

Donald Chu, Consolidated Edison, opens the tutorial with a discussion on the motivating elements that drove the need for a monitoring guide.

Jeff Benach, Weidmann, then presents an overview of the transformer component failure mechanisms and corresponding measurement signals. He will cover Table 1 in the guide which lists main transformer components, failure mechanisms for those components and the measured signals associated with these failure mechanisms.

Claude Beauchemin, TJ/H2b, follows with an explanation of the various parameters that can be monitored.

Tony Pink, Dynamic Ratings, next discusses monitoring systems and equipment, including sensors, instrumentation and communication.

Brian Sparling, Dynamic Ratings, ends with a presentation on the subject of performing a cost / benefit analysis. While determining cost is relatively straightforward, the guide presents concepts for quantifying the monitoring benefits.

Learning Objectives

This presentation will help attendees justify, specify, design and implement the use of monitoring systems.

Learning Outcomes

As a result of attending this technical presentation, members will gain an understanding of the following:

- "What, Why and How" of monitoring
- Failure mechanisms and associated signals that can be monitored
- Cost / Benefit tools to provide a quantitative evaluation that can be used to assess when and where monitoring is justified
- Content and application of the C57.143 guide

Presenters' Biographies

Claude Beauchemin graduated from Université de Montréal in chemistry in 1976. He worked for GE Canada (formerly Syprotec) for 30 years, where he specialized in the development and application of on-line monitoring devices of physico-chemical parameters of power transformers. In 2011, Claude became the director of technical development for TJH2b Analytical Services. He is a member of the IEEE Transformers Committee, CIGRE, IEC, CSC and the Ordre Des Chimistes du Québec.

Jeff Benach, director of technology for Weidmann Diagnostic Solutions, graduated from the Ohio Institute of Technology in 1982 with a BS in electronics engineering technology. He also earned an MBA in technology management from the University of Phoenix in 2003. Jeff has 32 years of industry experience, 25 years in the power industry. He is a Senior Member of the IEEE and an active member of the Transformers Committee.

Donald Chu is manager of the Substation Equipment Engineering Section of Con Edison Company of New York. With over 30 years of engineering and R&D experience in distribution and substation equipment, he is responsible for the development, design, engineering, construction, failure analysis and maintenance support for all major electrical equipment in transmission and area substations. Donald received his BSEE degree in 1975 and MSEE degree in 1976, both from Cornell University, New York, NY. He is a registered Professional Engineer in New York State and an active member of IEEE, EEI, CEATI and EPRI. He was the chairman of the Transformers Committee's working group that developed the new Guide for Application of Monitoring Equipment to Liquid-Immersed Transformers and Components C57.143 as well as an active member of several other working groups and subcommittees.

Tony Pink is the general manager and chief operating officer for Dynamic Ratings, Inc. Tony founded Dynamic Ratings' North American operations in 2002, managing the business through both organic growth and acquisitions. Prior to his current position, he worked for Waukesha Electric Systems' service group as the general manager. Tony has an electrical engineering degree from Milwaukee School of Engineering and an MBA from Marquette. Most recently, he served as secretary for the Transformers Committee's working group that developed the new Guide for Application of Monitoring Equipment to Liquid-Immersed Transformers and Components C57.143.

Brian Sparling, regional manager for Dynamic Ratings, Inc., has over 20 years of experience in the field of power and distribution transformers. He has been involved in all aspects of monitoring and diagnostics of power transformers for the last 20 years, authoring and co-authoring more than 18 technical papers on various relative topics. Brian is a Senior Member of IEEE and has worked on many guides and standards with the Transformers Committee, Canadian Electricity Association and CIGRE Study Committee A2 Transformers.