IEEE PES Transformers Committee
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Review of PC57.120 Guide for Loss Evaluation of Distribution & Power Transformers and Reactors

— Technical Presentation —
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1. Abstract

This guide provides details and explanations for determining the constituent components and methodology for determining the economic value of distribution and power transformer and reactor losses for both utility and non-utility segments. Focusing on the cost of losses from the energy consumption of equipment perspective, the guide does not provide methods to quantify other social or environmental benefits that could be related to equipment efficiencies.

Losses are quantified typically for the purposes of purchasing evaluation or replacement cost analysis. Quantifying losses is important because equipment manufacturers have a large number of available design options and providing loss values from the user will help the manufacturer propose the most economic design to fit the user's circumstances.

Presentation will cover the following topics:

- History of the Guide for Loss Evaluation
- Highlights of the approved draft
- Loss evaluation, equipment, cost and load parameters
- Transformer loss evaluation for industrial and commercial entities and transmission only electric utilities
- Experience of loss evaluation from a utility company's perspective
- Experience of loss evaluation from a manufacturer's perspective

2. Learning Objectives

This presentation will help attendees understand the principles and concepts regarding the application of power transformer loss evaluation and will assist users when deciding how to value the efficiency of equipment. Ultimately, efficiency depends heavily on how the equipment is used, where on the power system it is used and what decisions are made regarding operating conditions, such as loading beyond nameplate and timing of asset additions/replacement.

3. Learning Outcomes

As a result of attending this presentation, members will gain an understanding of the economic loss evaluation of liquid-filled distribution and power transformers, dry-type distribution and power transformers and reactors.

4. Presenters' Biographies

Wallace Binder is a consultant engineer at WBBinder Consultant. He has over 30 years of utility experience managing maintenance and operation of company owned and major customer owned substations. He also managed substation apparatus engineering, including application, technical and economic evaluation, preparation of specifications, vendor contacts, bidder qualification and performance evaluation. Wallace led all corporate activities for transmission and distribution planning; site and right-of-way acquisition; transmission, distribution and substation design and project management for a subsidiary operating company. He has been an active member of the IEEE PES Transformers Committee since November 1987.

Rod Sauls is a principal engineer with Southern Company Services. He works in the Substation Transmission Design and Maintenance Support Group with responsibility for substation major equipment, including circuit breaker, switchgear, voltage regulator, transformer and mobile substation specifications across the Alabama Power Company territory. Rod began his career in the steel mill and telecommunications industries before coming to Alabama Power Company in 2002. He received his BSEE degree from University of Alabama-Tuscaloosa and earned his Professional Engineering license from the State of Alabama. Rod has many years of involvement with IEEE PES Transformers and Switchgear Committees and is the current Vice Chair for WG PC157.120.

Alfons Schrammel is a senior manager in the Engineering Department of Siemens Transformers in Weiz, Austria. He is in charge of electrical design of large power transformers and shunt reactors. After graduating from the Technical University of Graz, he started in 1986 as a design engineer for large power transformers at ELIN. In 1990, he changed to technical project management and was responsible for special projects, such as the first 500kV phase shifter ever built. From 1996 onward, Alfons was in charge of the electrical design department. Since 2012, he has been responsible for engineering in the business function Global Technology Center for Large Power Transformers.

Dr. Rogerio Verdolin is a consultant engineer at Verdolin Solutions. He spent more than 20 years with CEPEL - Brazil's preeminent Electrical Energy Research Centre, where he managed the High Voltage Laboratory and various research programs supported by utility companies, equipment manufacturers and other industry companies. After moving to Calgary in 1998, he joined GE Energy Services, where he contributed to the development of new products for substation on-line monitoring. Rogerio's 40-year career also includes positions with SNC Lavalin, ENMAX, ATCO and Teshmont Consultants, providing support in substation design, high voltage equipment specification, power system transient overvoltage studies and consultant services, including transient recovery voltage, insulation coordination and geomagnetically induced current simulation studies. He received his BS and MS degrees in Electrical Engineering from the Federal University of Rio de Janeiro and his PhD from the University of Manitoba and has enjoyed many years of involvement with the IEEE PES Transformers Committee, including his current position as Chair of WG PC157.20.