IEEE/PES Transformers Committee
Fall 2003 Meeting, October 5-9, 2003
Pittsburgh, Pennsylvania, USA

IEEE Bushing Standard C57.19.01-2000
Bushing Rating and Dimensional Simplifications Included in the New Standard
-- Panel Discussion, Tuesday, October 7, 4:45 pm --

by Fred Elliott, Mark Rivers, and Loren Wagenaar

1. Abstract

IEEE Standard C57.19.01-2000 reduced the number of different bushing ratings and dimensions from the previous versions of the standard. This project was started as the result of industry surveys which indicated an interest on the part of utilities to streamline their spare bushing stocks.

An additional purpose for this session is to solicit input for future work on this standard.

2. Learning Objectives

Understanding of the new bushing standard ratings and the reasons for their selection.

Specific topics that will be addressed by the presenters include:

- Background of the changes
- Ratings included in the C57.19.01-2000 standard
- Replacement bushings
- Discussion/comments for future revisions of this standard

3. Learning Outcomes

Attendees will become acquainted with rating structure for bushings. Specifically identified outcomes include improved understanding of:

- Reasons for fewer standard sizes of bushings
- The electrical structure of the current standard
- Standardized dimensions in the new standard
- Support for replacement bushings
- Issues for future revision of this standard

4. Presenter's Biographies

Fred E. Elliott: Mr. Elliott (SM) is a Senior Engineer in the Bonneville Power Administration Transmission Business Line High Voltage Equipment Engineering Group. He is responsible for Power Transformer, Shunt Reactor, and Bushing applications. He also participates in procurements as BPA's technical representative. He works closely with planning, procurement, specifications, construction and maintenance personnel in the performance of these duties. Prior to joining BPA in 1986, Mr. Elliott worked with Chas. T. Main, Inc. and Pacific Power & Light in the substation design and equipment procurement areas. He received a B.S.E.E. degree from Oregon State University in 1971. He is a member of IEEE/PES, DEIS, and the IEEE/PES Transformers Committee where he is chair of the Bushing Subcommittee. He is a Registered Professional Engineer in Oregon.

Mark Rivers: Mr. Rivers received his Bachelor of Science in Electrical Engineering from the University of Massachusetts at Amherst, Massachusetts in 1979 and a Masters of Business Administration at Nichols College in Dudley, Massachusetts in 1990. Since 1979, he is employed by the Doble Engineering Company as a Principal Engineer, consulting on electric power equipment insulation testing and maintenance. He has been active on the Doble Transformer and Circuit Breakers & Bushing Committees and has managed insulation software development. He is presently the Director of Information Technology. He has authored numerous papers in the area of Transformer and Circuit Breaker Testing. He was a technical contributor to the EPRI Guidelines for the Life Extensions of Substations and a member of the IEEE Working Group on Performance Characteristics and Dimensions for Outdoor Apparatus Bushings.

Loren B. Wagenaar: Mr. Wagenaar (F-96) is a Principal Engineer in the AEP Transmission Asset Management Department responsible for procurement of power and current transformers, and is involved with specifications, in-house and industry standards, performance evaluation, cost of loss analysis, design reviews, test witnessing, vendor selection and performance, and analysis of in-service failures. Prior to 1982, he worked for Westinghouse Electric Corp. for 17 years, where experience included transformer design, bushing design, development and manufacture, and development of insulation systems. He received a BSEE degree from South Dakota State University, a MSEE degree from Akron State University, and a MS Math degree from Ball State University. He is a member of IEEE/PES, DEIS, SCC 4, HVTT and the IEEE/PES Transformers Committee, where he is chair of the Dielectric Test Subcommittee and past chair of the Bushing Subcommittee. He is also a US representative to IEC Technical Committee 14, Transformers, and is a member of IEC Working Group 24, which is concerned with dielectric tests and external clearances on transformers. He has eight US patents, has co-authored 13 technical publications, and is a registered Professional Engineer in Indiana.