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IEEE Standard for Qualification of Class 1E Transformers for Nuclear Power Generating Stations

Sponsor

Transformers Committee
of the
IEEE Power Engineering Society

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Foreword

(This foreword is not a part of IEEE Std 638-1992, IEEE Standard for Qualification of Class IE Transformers for Nuclear Power Generating Stations.)

IEEE Std 323-1983 was developed to provide guidance for demonstrating and documenting the qualification of electrical equipment used in all Class IE and interface systems.

This document (IEEE Std 638-1992) was developed to provide specific methods and test procedures for the qualification of Class IE transformers in accordance with IEEE Std 323-1983.

The qualifying tests described in this standard have been established for application to new transformers. This industry experience, together with a combination of some or all of the methods described, has the capability of demonstrating a qualified life of transformers up to 40 years or more. These criteria form the basis for documenting qualification of transformers for nuclear power generating stations.

Because of the conservative approach used in the development of this standard for new transformers, the end point criteria cannot be used for in-service transformers. Criteria representative of actual operating conditions should be used to qualify such transformers.

Additionally, the appendix discusses state-of-the-art technology pertaining to the evaluation of transformer insulation materials and systems, its applicability to the aging of transformers, and its relationship to "real time." Transformer loading guides are also referenced that include procedures developed to calculate the relative fraction of insulation life considered to be expended under various loading conditions.

Based on loading and existing aging guidance, it can be demonstrated that use of insulation systems at a reduced temperature will result in reduced aging of the insulation system during the design life of a transformer. See A2.3 for an example.

Adherence to this document alone may not suffice for assuring public health and safety since it is the integrated performance of structures, fluid systems, instrumentation systems, and electrical systems of the nuclear power generating station that establish safe operating conditions.

This document was prepared by the Working Group on Qualification of Class IE Transformers of the Performance Characteristics Subcommittee of the IEEE Transformers Committee.

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