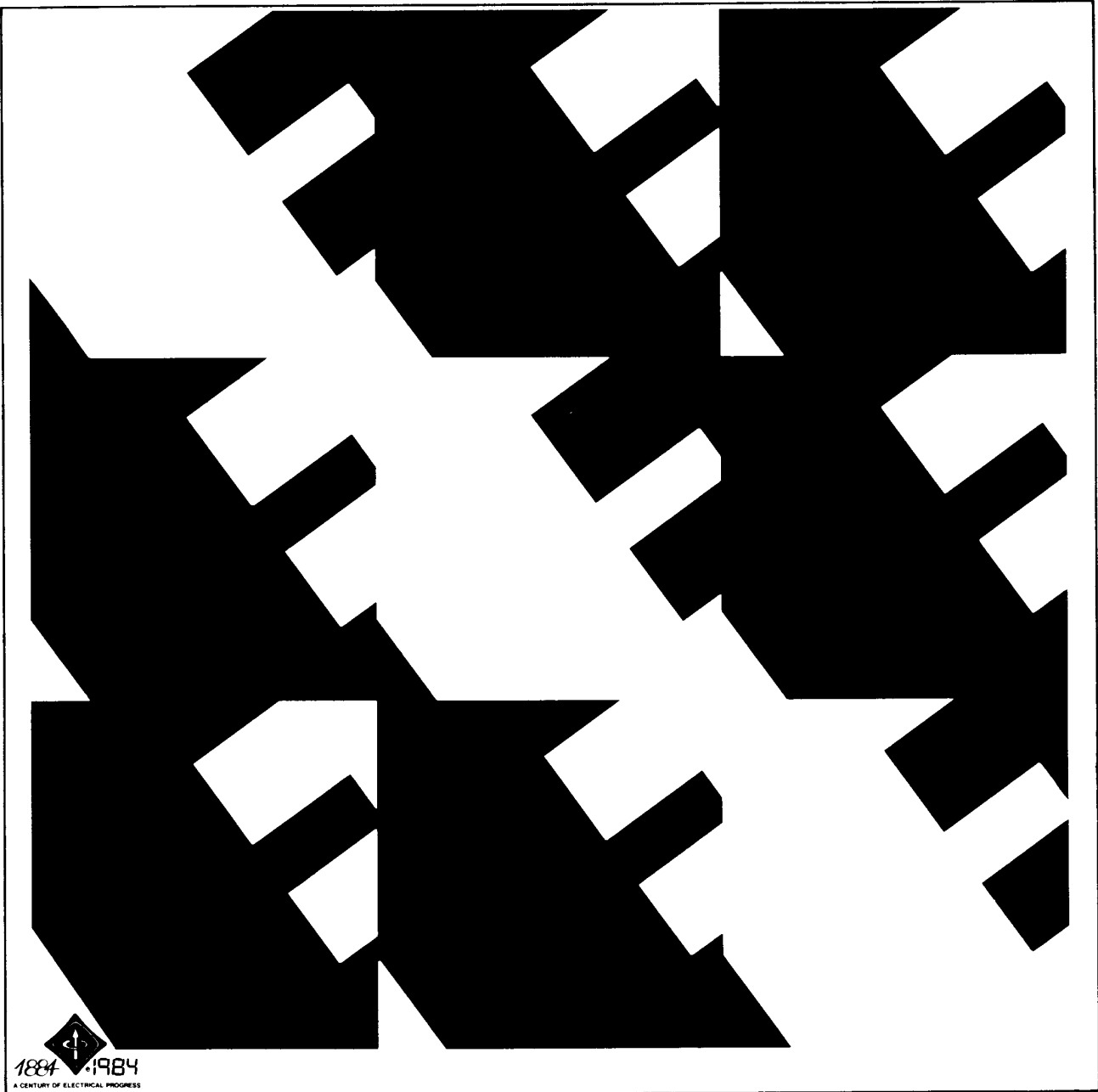


IEEE Standard for Qualifying Class 1E Motor Control Centers for Nuclear Power Generating Stations

ANSI/IEEE Std 649-1980



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Class 1E Motor Control Centers for
Nuclear Power Generating Stations**

Sponsor

Nuclear Power Engineering Committee of the
IEEE Power Engineering Society

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Foreword

(This Foreword is not part of IEEE Std 649-1980, IEEE Standard for Qualifying Class 1E Motor Control Centers for Nuclear Power Generating Stations.)

IEEE Std 323-1974 provides general guidance for demonstrating and documenting the adequacy of electrical equipment used in all Class 1E and interface systems. IEEE Std 649-1980 has been prepared to deal specifically with motor control center equipment, using IEEE Std 323-1974 as the parent document for guidance.

Safety systems equipment in nuclear power generating stations must meet or exceed performance requirements throughout their installed lives. This is accomplished by a disciplined program of design qualification and quality assurance of design, production, installation, maintenance, and surveillance. This standard is for the design qualification portion of the program only.

The nuclear power generating station safety analysis, in part, considers the station and its safety system design in terms of a set of postulated service conditions. Inherent in such analysis are two presumptions that must be evaluated to assure overall technical validity. First, designs must be such that equipment is capable of actually performing designated Class 1E functions in postulated service environments. Second, in-service aging must not degrade a safety systems equipment from its original design condition to the point where it cannot perform designated Class 1E functions, when required.

The special environmental stresses associated with some postulated service conditions promote the possibility that production testing, normal service testing, and surveillance may not be able to determine if the equipment is vulnerable to failure, either as a result of inadequate design or aging. Under these circumstances, simultaneous failure of redundant safety equipment might occur just at the time Class 1E functions are required. It is the fundamental role of qualification to provide reasonable assurance that design and age-related common failure modes do not exist and that the equipment design is adequate to permit the equipment to perform its Class 1E function during postulated service conditions.

Adherence to this standard alone may not suffice for assuring public health and safety, since it is the integrated performance of the structures, fluid systems, instrumentation systems, and electrical systems of the generating station that establishes safe operating conditions. Each applicant has the responsibility to establish that this standard, if used, is pertinent to the particular requirements of the generating station of concern and that the integrated performance of the station is adequate.

This standard was prepared by a working group of Subcommittee 2 (Qualification) of the Nuclear Power Engineering Committee (NPEC) of the IEEE Power Engineering Society. Members of this working group were:

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