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Criteria for accident monitoring instrumentation for nuclear power generating stations

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IEC 63147:2017

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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland
Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue
New York, NY 10016-5997
United States of America
stds.info@ieee.org
www.ieee.org

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CRITERIA FOR ACCIDENT MONITORING INSTRUMENTATION FOR NUCLEAR POWER GENERATING STATIONS

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IEEE Std	FDIS	Report on voting
IEEE Std 497™-2016	45A/1167/FDIS	45A/1170/RVD

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IEEE Standard Criteria for Accident Monitoring Instrumentation for Nuclear Power Generating Stations

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Abstract: Established in this standard are criteria for variable selection, performance, design, and qualification of accident monitoring instrumentation for anticipated operational, design basis events and severe accidents.

Keywords: accident monitoring, design criteria, display criteria, IEEE 497™, performance criteria, selection criteria, severe accidents, type variables

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IEEE Introduction

This introduction is not part of IEEE Std 497™-2016, IEEE Standard Criteria for Accident Monitoring Instrumentation for Nuclear Power Generating Stations.

History

This standard evolved from IEEE Std 497™-2010 [B4]¹. It represents a continued effort by IEEE to support the specification, design, and implementation of accident monitoring instrumentation of nuclear power generating stations.

IEEE Std 497-2010 [B4] was developed to provide criteria for advanced instrumentation system designs and design modifications based on modern digital technology. It marked a clear path forward for the application of new technology. Though still maintaining applicability to existing systems, this version of IEEE Std 497 provides more current guidance based on historically related standards and guidance.

It was the working group's intention that the criteria of this standard address the variety of possible accident monitoring channel configurations that current technology affords. It was also the working group's intention to address the display of information using computer generated displays and calculated values. The criteria presented in this standard provide guidance in this area without limiting the types of displays that can be made available to accident management personnel.

Although written primarily for new plant designs, existing plants may also use the guidance and applicable criteria in this standard. The use of applicable plant procedures to determine the requirements of the accident monitoring instrumentation provides the necessary flexibility for useful design criteria. This standard can be used to help address the necessary changes to the plant configuration that occur over the operating life of any plant.

Historically the standard addressed accident monitoring instrumentation used for anticipated operating occurrences (AOOs) and design basis events (DBEs). To address lessons learned from various industry events, the scope of this standard has evolved to now include severe accidents. This evolution was intended to provide a broader applicability to cover both preventative and mitigative phases of potential plant events. A broader applicability of the standard was also achieved by moving to a more international, technology neutral approach to the standard. This approach was achieved by changing to International Atomic Energy Agency (IAEA) definitions of terms, where applicable; the removal, where appropriate, of U.S. specific references; and involvement in the working group of members of other standards organizations. Furthermore, the corresponding International Electrotechnical Commission (IEC) counterparts to the IEEE standards referenced were investigated and introduced as a second set of normative references. This opens the possibility to apply this standard in the IEC domain. The individual IEEE and IEC reference sets in whole are individually appropriate for use in the application of the standard, but inclusion of the IEEE and IEC references does not imply equivalency between the individual references of the two sets.

Intended use

The standard applies to instrumentation intended for use during anticipated operational occurrences (AOO), design basis events (DBE), and design extension conditions (DEC) including severe accidents.

This standard defines severe accidents as a subset of design extension conditions during which fuel damage has occurred. Operationally, severe accidents and design extension conditions without fuel damage are

¹ The numbers in brackets correspond to those of the bibliography in Annex D.