IEC/IEEE 62582-1 Ed.1: Nuclear power plants – Instrumentation and control important to safety – Electrical equipment condition monitoring methods

Part 1 General

Part 2 Indenter modulus

Part 4 Oxidation Induction methods

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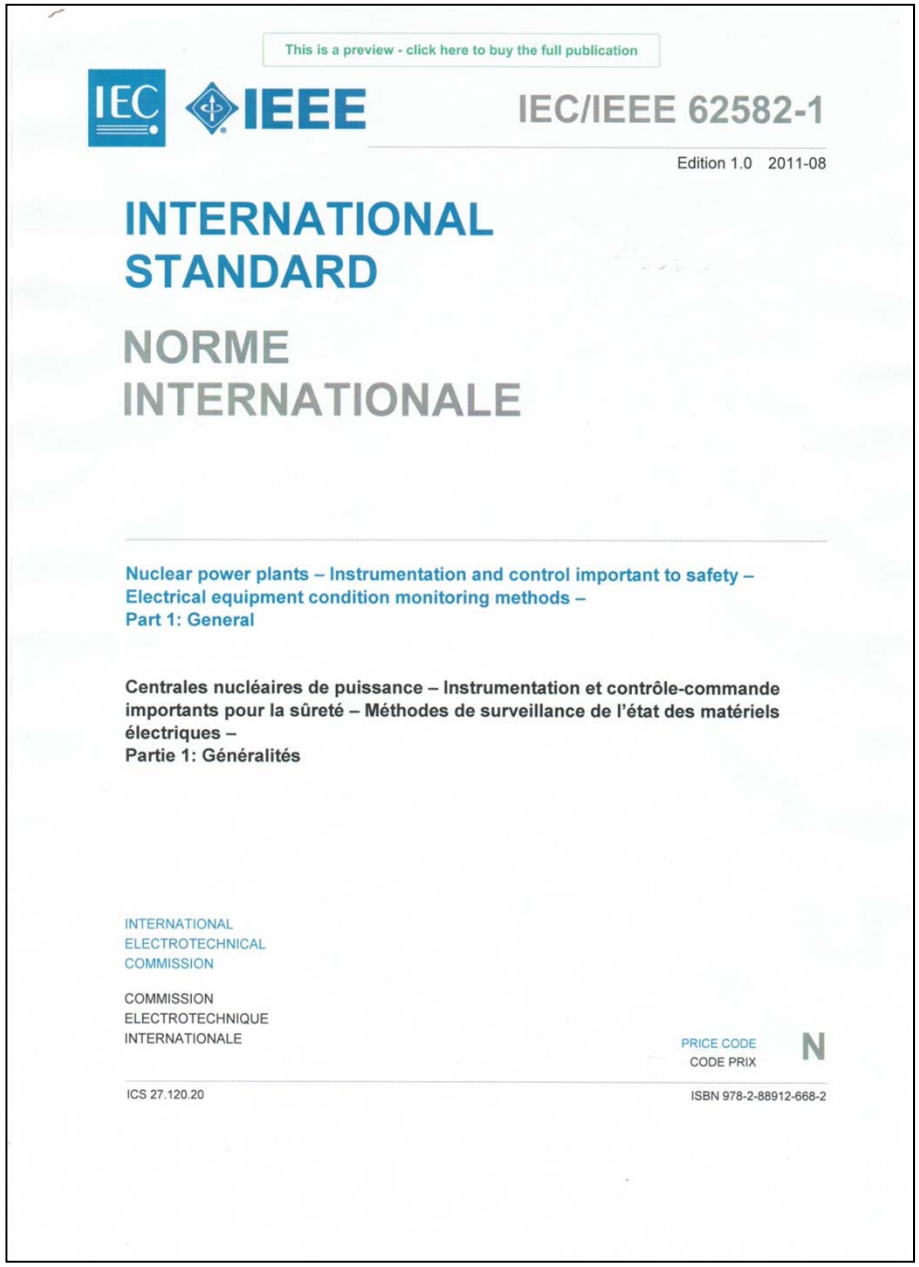

IEC IEEE

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Nuclear power plants – Instrumentation and control important to safety – Electrical equipment condition monitoring methods – Part 1: General

Centrales nucléaires de puissance – Instrumentation et contrôle-commande importants pour la sûreté – Méthodes de surveillance de l'état des matériels électriques – Partie 1: Généralités

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Part 3 Elongation-at-break: 45A/853/CDV circulated 110923, closing date 120224, prel FDIS to IEEE after Karlsruhe

Part 5 Optical time domain reflectometry: CD expected after Karlsruhe

Other parts under consideration

List of CM methods under consideration

- Time or Frequency Domain Reflectometry (TDR/FDR)
- Line Resonance Analysis (LIRA)
- Near Infrared Reflectometry (NIR)
- Fourier Transform Infrared Reflectometry (FTIR)
- Dielectric Loss Factor (Tan delta)
- Insulation Resistance
- Thermogravimetric Analysis (TGA)
- Portable Polymer Tester (Indenter Recovery)
- Density

NWIP (Korean proposal): Management of ageing of sensors and transmitters

Identifies minimum requirements aimed at ensuring that any potential impacts on NPP safety due to ageing of sensors and transmitters of NPP can be identified and that suitable actions are undertaken to demonstrate that the safety of the plant will not be impaired.

Selection and use of wireless devices to be integrated in NPP important for safety systems

The WG meeting on Nuclear Power Plant Control and Instrumentation, held in Yokohama 2009, resulted in a recommendation to develop a TR addressing the applicability of wireless technology throughout the nuclear power plant systems. A draft was circulated and discussed at the Seattle meeting in 2010 and at the Garching intermediate meeting in 2011. A draft of the TR will be prepared at Karlsruhe in 2012. (proposal from Korea)

Nuclear Energy Standard Coordination Collaborative (NESCC) Electrical Cable task group

Standards for Electrical Equipment and Assemblies

a. **Electrical Cables, Splices, and Terminations**

b. **Fiber Optic Cables (EIA 472000-A)**

Standards for Design Basis

Design and Installation (IEEE 422-general, IEEE 690-Class 1E, NEMA WC 3, WC5, WC7, WC8; UL83, UL 44)

Standards for Service Life Prediction

Assessing, Monitoring, and Mitigating Aging (IEEE 1205)

Standards for Electrical Cable Condition Monitoring

Standards for LOCA Assessments

Gaps in Current Standards

Research Needs

Roadmap for the next decade

IAEA CRP: Qualification, Condition Monitoring, and Management of Aging of Low Voltage Cables in Nuclear Power Plants

Provide the current and next generation of nuclear facilities with information and guidelines on how to qualify new cables, monitor the performance of existing cables, and establish a program of cable aging management. Objectives:

Assemble a group of experts from around the world to provide input on cable qualification, condition monitoring, and aging management.

Compile the current knowledge in a report together with areas of future research and development to cover aging mechanisms and means to identify and manage the consequences of aging.

Round-robin test, including both the qualification question and the cable condition monitoring question.

Determine the relationship between cable performance and signal quality, plant safety, and interference issues including EMI/RFI effects arising from cable problems.

IAEA CRP cont. Planned programme for validation of condition monitoring techniques

Part of the scope is the validation of condition monitoring (CM) techniques using a benchmarking exercise. Some of the questions that need to be answered are –

What cable materials should be included in the programme?
What CM methods should we aim to include in the programme?
What do we need in terms of cable samples and tests to validate CM methods in the benchmarking exercise?
How do we make best use of naturally aged samples (if available)?
Should we limit CM validation to identification of ageing degradation (not defects)?