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Guidelines for in-service inspections for primary coolant circuit components of light water reactors —

Part 2: Magnetic particle and penetrant testing

Lignes directrices pour les contrôles périodiques des composants du circuit primaire des réacteurs à eau légère —

Partie 2: Contrôle par poudre magnétique et ressuage

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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Guidelines for in-service inspections for primary coolant circuit components of light water reactors —

Part 2:
Magnetic particle and penetrant testing

1 Scope

This document gives guidelines for pre-service inspections (PSI) and in-service inspections (ISI) of the surfaces using the magnetic particle testing and penetrant testing on components of the reactor coolant circuit of light water reactors. This document is also applicable to other components of nuclear installations.

Test systems for the localisation of surface inhomogeneities and requirements for test personnel, test devices, test media, accessories as well as optical auxiliaries, the preparation and implementation of the test as well as the recording are defined.

NOTE 1 Data concerning the test section, test extent, inspection period, inspection interval and evaluation of indications are defined in the applicable national nuclear safety standards.

NOTE 2 In general, this document is in accordance with ISO 3452 and ISO 9934 series. This document provides details to be considered in the standard test procedure (see Annex A).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3059, *Non-destructive testing — Penetrant testing and magnetic particle testing — Viewing conditions*

ISO 3452-1, *Non-destructive testing — Penetrant testing — Part 1: General principles*

ISO 3452-2, *Non-destructive testing — Penetrant testing — Part 2: Testing of penetrant materials*

ISO 3452-3, *Non-destructive testing — Penetrant testing — Part 3: Reference test blocks*

ISO 3452-4, *Non-destructive testing — Penetrant testing — Part 4: Equipment*

ISO 3452-5, *Non-destructive testing — Penetrant testing — Part 5: Penetrant testing at temperatures higher than 50 °C*

ISO 3452-6, *Non-destructive testing — Penetrant testing — Part 6: Penetrant testing at temperatures lower than 10 °C*

ISO 8596, *Ophthalmic optics — Visual acuity testing — Standard and clinical optotypes and their presentation*

ISO 9934-1, *Non-destructive testing — Magnetic particle testing — Part 1: General principles*

ISO 9934-2:2015, *Non-destructive testing — Magnetic particle testing — Part 2: Detection media*

ISO 9934-3, *Non-destructive testing — Magnetic particle testing — Part 3: Equipment*

ISO 9712:2012, *Non-destructive testing — Qualification and certification of NDT personnel*

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ISO 12706, *Non-destructive testing — Penetrant testing — Vocabulary*

ISO 12707, *Non-destructive testing — Magnetic particle testing — Vocabulary*

ISO 18490, *Non-destructive testing — Evaluation of vision acuity of NDT personnel*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12706, ISO 12707 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
component
part of a system delimited according to structural or functional aspects, which can still implement independent sub-functions

3.2
test section
part of the *test area* (3.4)

3.3
test supervisor
responsible for application of the test method and for the individual details of the test implementation including monitoring of the activities for preparation and implementation of the test as well as analysis of the test results

3.4
test area
defined area on the *test object* (3.6) over which the tests are to be conducted

[SOURCE: ISO 5577:2017, 6.2.2]

3.5
test surface
surface of the *test object* (3.6) to be tested

3.6
test object
part of a *component* (3.1) to be tested

3.7
test medium
<magnetic particle testing> magnetic particles suspended in liquid or in dry powder form, ready for use

[SOURCE: ISO 12707:2016, 2.17]

3.8
test medium
<penetrant testing> products consisting of cleaner, penetrants, removers and developers

[SOURCE: ISO 12706:2009, 2.19]

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