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

**Part 3:
Hydrostatic testing**

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

Partie 3: Essais de pression

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by ISO/TC 85, *Nuclear energy, nuclear technologies, and radiological protection*, Subcommittee SC 6, *Reactor technology*.

A list of all parts in the ISO 20890 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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

Part 3: Hydrostatic testing

1 Scope

This document gives guidelines for in-service system pressure tests of the reactor coolant circuit of light water reactors.

This document specifies the test technique, the requirements for measuring equipment and additional devices, the preparation and performance of the test as well as the recording and documentation, for the purpose to ensure the reliability and comparability of tests.

NOTE Data on (test) pressure, (test) temperature, scope of testing, rates of change of pressure and temperature, test schedule and inspection intervals can be obtained from the applicable national nuclear codes.

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

ISO 18490, *Non-destructive testing — Evaluation of vision acuity of NDT personnel* <https://www.iso.org/standard/68888/iso-20890-3-2020>

EN 837-2, *Pressure gauges — Part 2: Selection and installation recommendations for pressure gauges*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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

test medium

<pressure testing> reactor coolant or deionate

3.2

test temperature

temperature to which the pressure-retaining boundaries of the reactor coolant system and the *test medium* (3.1) are to be heated

3.3

test pressure

overpressure to which the reactor coolant system is exposed during the test

3.4

maximum operating pressure

design pressure

overpressure for which the reactor coolant system is designed with regard to safety, operational and constructional requirements

4 Test system

4.1 General

The system pressure test provides a global statement of integrity regarding the reactor coolant system and, as a safety measure for monitoring the consequences of alleged operationally induced damage mechanisms, is a part of the concept for assuring component integrity during operation.

A general test procedure shall be prepared. [Annex A](#) contains the items of the general test procedure.

4.2 Standard system

The system pressure test is an integral test covering pressure-retaining components of the reactor coolant system. After filling the reactor coolant system with the test medium, the system is pressurised in accordance with a pressure-temperature-schedule to the test pressure, which shall be applied continuously during a defined holding time. The pressure is then reduced to the operating pressure and a visual (inspection) examination of the pressure-retaining components is performed for leakages.

When planning and performing the visual (inspection) examination, aspects of minimising the radiation exposure shall be considered.

5 Requirements

5.1 Personnel requirements

The test personnel shall have the skills to perform the work they are to carry out. In particular, they shall possess adequate experience in performing and evaluating system pressure tests on pressurised containers and piping and relevant knowledge about the reactor coolant system and about operationally induced damage.

Those personnel, using qualified procedures and equipment, should be qualified through one or any combination of the following:

- certification through a national personnel certification scheme;
- theoretical and/or open trials.
- assessment based on the procedure set by testing organization

Any personnel certification requirements invoking relevant national personnel certification schemes should be validated according to [Table 1](#). Any additional personnel training requirements should also be specified in the qualification dossier.

If no relevant scheme exists or if extra personnel qualification is needed, the qualification body should determine the additional practical and theoretical examinations needed beyond those in the national certification scheme, include these in the qualification procedure and ensure that the test procedure also includes the necessary requirements. The qualification procedure should describe the proposed system.