

IAEA SAFETY STANDARDS SERIES

Site Evaluation for Nuclear Installations

SAFETY REQUIREMENTS

No. NS-R-3



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IAEA SAFETY STANDARDS

Under the terms of Article III of its Statute, the IAEA is authorized to establish standards of safety for protection against ionizing radiation and to provide for the application of these standards to peaceful nuclear activities.

The regulatory related publications by means of which the IAEA establishes safety standards and measures are issued in the **IAEA Safety Standards Series**. This series covers nuclear safety, radiation safety, transport safety and waste safety, and also general safety (that is, of relevance in two or more of the four areas), and the categories within it are **Safety Fundamentals**, **Safety Requirements** and **Safety Guides**.

Safety Fundamentals (blue lettering) present basic objectives, concepts and principles of safety and protection in the development and application of nuclear energy for peaceful purposes.

Safety Requirements (red lettering) establish the requirements that must be met to ensure safety. These requirements, which are expressed as 'shall' statements, are governed by the objectives and principles presented in the Safety Fundamentals.

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Information on the IAEA's safety standards programme (including editions in languages other than English) is available at the IAEA Internet site

www-ns.iaea.org/standards/

or on request to the Safety Co-ordination Section, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

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SITE EVALUATION FOR NUCLEAR INSTALLATIONS

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The Agency's Statute was approved on 23 October 1956 by the Conference on the Statute of the IAEA held at United Nations Headquarters, New York; it entered into force on 29 July 1957. The Headquarters of the Agency are situated in Vienna. Its principal objective is "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world".

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FOREWORD

by Mohamed ElBaradei
Director General

One of the statutory functions of the IAEA is to establish or adopt standards of safety for the protection of health, life and property in the development and application of nuclear energy for peaceful purposes, and to provide for the application of these standards to its own operations as well as to assisted operations and, at the request of the parties, to operations under any bilateral or multilateral arrangement, or, at the request of a State, to any of that State's activities in the field of nuclear energy.

The following bodies oversee the development of safety standards: the Commission on Safety Standards (CSS); the Nuclear Safety Standards Committee (NUSSC); the Radiation Safety Standards Committee (RASSC); the Transport Safety Standards Committee (TRANSSC); and the Waste Safety Standards Committee (WASSC). Member States are widely represented on these committees.

In order to ensure the broadest international consensus, safety standards are also submitted to all Member States for comment before approval by the IAEA Board of Governors (for Safety Fundamentals and Safety Requirements) or, on behalf of the Director General, by the Publications Committee (for Safety Guides).

The IAEA's safety standards are not legally binding on Member States but may be adopted by them, at their own discretion, for use in national regulations in respect of their own activities. The standards are binding on the IAEA in relation to its own operations and on States in relation to operations assisted by the IAEA. Any State wishing to enter into an agreement with the IAEA for its assistance in connection with the siting, design, construction, commissioning, operation or decommissioning of a nuclear facility or any other activities will be required to follow those parts of the safety standards that pertain to the activities to be covered by the agreement. However, it should be recalled that the final decisions and legal responsibilities in any licensing procedures rest with the States.

Although the safety standards establish an essential basis for safety, the incorporation of more detailed requirements, in accordance with national practice, may also be necessary. Moreover, there will generally be special aspects that need to be assessed on a case by case basis.

The physical protection of fissile and radioactive materials and of nuclear power plants as a whole is mentioned where appropriate but is not treated in detail; obligations of States in this respect should be addressed on the basis of the relevant instruments and publications developed under the auspices of the IAEA. Non-radiological aspects of industrial safety and environmental protection are also not explicitly considered; it is recognized that States should fulfil their international undertakings and obligations in relation to these.

The requirements and recommendations set forth in the IAEA safety standards might not be fully satisfied by some facilities built to earlier standards. Decisions on the way in which the safety standards are applied to such facilities will be taken by individual States.

The attention of States is drawn to the fact that the safety standards of the IAEA, while not legally binding, are developed with the aim of ensuring that the peaceful uses of nuclear energy and of radioactive materials are undertaken in a manner that enables States to meet their obligations under generally accepted principles of international law and rules such as those relating to environmental protection. According to one such general principle, the territory of a State must not be used in such a way as to cause damage in another State. States thus have an obligation of diligence and standard of care.

Civil nuclear activities conducted within the jurisdiction of States are, as any other activities, subject to obligations to which States may subscribe under international conventions, in addition to generally accepted principles of international law. States are expected to adopt within their national legal systems such legislation (including regulations) and other standards and measures as may be necessary to fulfil all of their international obligations effectively.

EDITORIAL NOTE

An appendix, when included, is considered to form an integral part of the standard and to have the same status as the main text. Annexes, footnotes and bibliographies, if included, are used to provide additional information or practical examples that might be helpful to the user.

The safety standards use the form 'shall' in making statements about requirements, responsibilities and obligations. Use of the form 'should' denotes recommendations of a desired option.

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1. INTRODUCTION

BACKGROUND

1.1. This Safety Requirements publication supersedes the Code on the Safety of Nuclear Power Plants: Siting, which was issued in 1988 as Safety Series No. 50-C-S (Rev. 1). It takes account of developments relating to site evaluations for nuclear installations since the Code on Siting was last revised. These developments include the issuing of the Safety Fundamentals publication on The Safety of Nuclear Installations [1], and the revision of various safety standards and other publications relating to safety. Requirements for site evaluation are intended to ensure adequate protection of site personnel, the public and the environment from the effects of ionizing radiation arising from nuclear installations. It is recognized that there are steady advances in technology and scientific knowledge, in nuclear safety and in what is considered adequate protection. Safety requirements change with these advances and this publication reflects the present consensus among States.

1.2. This Safety Requirements publication was prepared under the IAEA programme on safety standards for nuclear installations. It establishes requirements and provides criteria for ensuring safety in site evaluation for nuclear installations. The Safety Guides on site evaluation listed in the references provide recommendations on how to meet the requirements established in this Safety Requirements publication.

OBJECTIVE

1.3. The objective of this publication is to establish the requirements for the elements of a site evaluation for a nuclear installation so as to characterize fully the site specific conditions pertinent to the safety of a nuclear installation.

1.4. The purpose is to establish requirements for criteria, to be applied as appropriate to site and site–installation interaction in operational states and accident conditions, including those that could lead to emergency measures for:

- (a) Defining the extent of information on a proposed site to be presented by the applicant;

- (b) Evaluating a proposed site to ensure that the site related phenomena and characteristics are adequately taken into account;
- (c) Analysing the characteristics of the population of the region and the capability of implementing emergency plans over the projected lifetime of the plant;
- (d) Defining site related hazards.

1.5. This publication does not specifically address underground or offshore installations.

SCOPE

1.6. The scope of this publication encompasses site related factors and site–installation interaction factors relating to plant operational states and accident conditions, including those that could lead to emergency measures, and natural and human induced events external to the installation that are important to safety. The external human induced events considered in this Safety Requirements publication are all of accidental origin. Considerations relating to the physical protection of the installation against wilful actions by third parties are outside its scope.

1.7. The phrase ‘external to the installation’ is intended to include more than the external zone (see the Glossary). In addition to the area immediately surrounding the site, the site area itself may contain objects that pose a hazard to the installation, such as an oil storage tank for diesel generators or another reactor on a multiunit site.

1.8. The siting process for a nuclear installation generally consists of an investigation of a large region to select one or more candidate sites (site survey)¹, followed by a detailed evaluation of those candidate sites. This publication is primarily concerned with the latter stage.

1.9. Previous safety standards on this subject related to land based, stationary thermal neutron power plants. This Safety Requirements publication has been extended to cover a more comprehensive range of nuclear installations: land based, stationary nuclear power plants and research reactors, as well as nuclear

¹ Site survey is the process that is used to identify preferred candidate sites for nuclear installations on the basis of safety and other considerations.