

IAEA

Safety Standards



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

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Printed by the IAEA in Austria
September 2018

IAEA Safety Standards Series

The IAEA Safety Standards Series comprises publications of a regulatory nature covering nuclear safety, radiation protection, radioactive waste management, the transport of radioactive material, the safety of nuclear fuel cycle facilities and management systems. These publications are issued under the terms of Article III of the IAEA's Statute, which authorizes the IAEA to establish "standards of safety for protection of health and minimization of danger to life and property". Safety standards are categorized into:

- Safety Fundamentals, stating the basic objective, concepts and principles of safety;
- Safety Requirements, establishing the requirements that must be fulfilled to ensure safety; and
- Safety Guides, recommending measures for complying with these requirements for safety.

For numbering purposes, the IAEA Safety Standards Series is subdivided into General Safety Requirements and General Safety Guides (GSR and GSG), which are applicable to all types of facilities and activities, and Specific Safety Requirements and Specific Safety Guides (SSR and SSG), which are for application in particular thematic areas.

FOREWORD

by Yukiya Amano
Director General

The IAEA's Statute authorizes the Agency to “establish or adopt... standards of safety for protection of health and minimization of danger to life and property” — standards that the IAEA must use in its own operations, and which States can apply by means of their regulatory provisions for nuclear and radiation safety. The IAEA does this in consultation with the competent organs of the United Nations and with the specialized agencies concerned. A comprehensive set of high quality standards under regular review is a key element of a stable and sustainable global safety regime, as is the IAEA's assistance in their application.

The IAEA commenced its safety standards programme in 1958. The emphasis placed on quality, fitness for purpose and continuous improvement has led to the widespread use of the IAEA standards throughout the world. The Safety Standards Series now includes unified Fundamental Safety Principles, which represent an international consensus on what must constitute a high level of protection and safety. With the strong support of the Commission on Safety Standards, the IAEA is working to promote the global acceptance and use of its standards.

Standards are only effective if they are properly applied in practice. The IAEA's safety services encompass design, siting and engineering safety, operational safety, radiation safety, safe transport of radioactive material and safe management of radioactive waste, as well as governmental organization, regulatory matters and safety culture in organizations. These safety services assist Member States in the application of the standards and enable valuable experience and insights to be shared.

Regulating safety is a national responsibility, and many States have decided to adopt the IAEA's standards for use in their national regulations. For parties to the various international safety conventions, IAEA standards provide a consistent, reliable means of ensuring the effective fulfilment of obligations under the conventions. The standards are also applied by regulatory bodies and operators around the world to enhance safety in nuclear

power generation and in nuclear applications in medicine, industry, agriculture and research.

Safety is not an end in itself but a prerequisite for the purpose of the protection of people in all States and of the environment — now and in the future. The risks associated with ionizing radiation must be assessed and controlled without unduly limiting the contribution of nuclear energy to equitable and sustainable development. Governments, regulatory bodies and operators everywhere must ensure that nuclear material and radiation sources are used beneficially, safely and ethically. The IAEA safety standards are designed to facilitate this, and I encourage all Member States to make use of them.

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Safety Fundamentals

Fundamental Safety Principles

Safety Fundamentals

IAEA Safety Standards Series No. SF-1

This publication states the fundamental safety objective and ten associated safety principles, and briefly describes their intent and purpose. The fundamental safety objective — to protect people and the environment from harmful effects of ionizing radiation — applies to all circumstances that give rise to radiation risks. The safety principles are applicable, as relevant, throughout the entire lifetime of all facilities and activities — existing and new — utilized for peaceful purposes, and to protective actions to reduce existing radiation risks. They provide the basis for requirements and measures for the protection of people and the environment against radiation risks and for the safety of facilities and activities that give rise to radiation risks, including, in particular, nuclear installations and uses of radiation and radioactive sources, the transport of radioactive material and the management of radioactive waste.

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Spanish Edition (23 pp.; 2007) • ISBN 978-92-0-308707-0 • STI/PUB/1273 • €25.00

General Safety Standards

Governmental, Legal and Regulatory Framework for Safety

General Safety Requirements

IAEA Safety Standards Series No. GSR Part 1 (Rev. 1)

This publication establishes requirements in respect of the governmental, legal and regulatory framework for safety. It covers the essential aspects of the framework for establishing a regulatory body and taking other actions necessary to ensure the effective regulatory control of facilities and activities utilized for peaceful purposes. Other responsibilities and functions, such as liaison within the global safety regime and on support services for safety (including radiation protection), emergency preparedness and response, nuclear security, and the State system of accounting for and control of nuclear material, are also covered. A review of Safety Requirements publications was

commenced in 2011 following the accident in the Fukushima Daiichi nuclear power plant in Japan. The review revealed no significant areas of weakness and resulted in just a small set of amendments to strengthen the requirements and facilitate their implementation, which are contained in the present publication.

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Leadership and Management for Safety

General Safety Requirements

IAEA Safety Standards Series No. GSR Part 2

This Safety Requirements publication establishes requirements that support Principle 3 of the Fundamental Safety Principles in relation to establishing, sustaining and continuously improving leadership and management for safety and an integrated management system. It emphasizes that leadership for safety, management for safety, an effective management system and a systemic approach (i.e. an approach in which interactions between technical, human and organizational factors are duly considered) are all essential to the specification and application of adequate safety measures and to the fostering of a strong safety culture. Leadership and an effective management system will integrate safety, health, environmental, security, quality, human and organizational factors, societal and economic elements. The management system will ensure the fostering of a strong safety culture, regular assessment of performance and the application of lessons from experience. The publication is intended for use by regulatory bodies, operating organizations and other organizations concerned with facilities and activities that give rise to radiation risks.

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Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards

General Safety Requirements

IAEA Safety Standards Series No. GSR Part 3

This publication is the new edition of the International Basic Safety Standards. The edition is co-sponsored by seven other international organizations — European Commission (EC/Euratom), FAO, ILO, OECD/NEA, PAHO, UNEP and WHO. It replaces the interim edition that was published in November 2011 and the previous edition of the International Basic Safety Standards which was published in 1996. It has been extensively revised and updated to take account of the latest finding of the United Nations Scientific Committee on the Effects of Atomic Radiation, and the latest recommendations of the International Commission on Radiological Protection. The publication details the requirements for the protection of people and the environment from harmful effects of ionizing radiation and for the safety of radiation sources. All circumstances of radiation exposure are considered.

Arabic Edition (443 pp., 2 figs; 2015) • ISBN 978-92-0-605815-2 • STI/PUB/1578 • €68.00

Chinese Edition (421 pp., 2 figs; 2015) • ISBN 978-92-0-505615-9 • STI/PUB/1578 • €68.00

English Edition (436 pp., 2 figs; 2014) • ISBN 978-92-0-135310-8 • STI/PUB/1578 • €68.00

French Edition (457 pp., 2 figs; 2016) • ISBN 978-92-0-200316-3 • STI/PUB/1578 • €68.00

Russian Edition (477 pp., 2 figs; 2015) • ISBN 978-92-0-409915-7 • STI/PUB/1578 • €68.00

Spanish Edition (451 pp., 2 figs; 2016) • ISBN 978-92-0-307915-0 • STI/PUB/1578 • €68.00

Safety Assessment for Facilities and Activities

General Safety Requirements

IAEA Safety Standards Series No. GSR Part 4 (Rev. 1)

This publication describes the generally applicable requirements to be fulfilled in safety assessments for facilities and activities, with special attention paid to defence in depth, quantitative analyses and the application of a graded approach to the range of facilities and activities that are addressed. The requirements provide a consistent and coherent basis for safety assessments, facilitating the transfer of good practices between organizations. A review of Safety Requirements publications was commenced in 2011 following the accident in the Fukushima Daiichi nuclear power plant in Japan. The review revealed no significant areas of weakness and resulted in just a small set of amendments to strengthen the requirements and facilitate their implementation, which are contained in the present publication.

Arabic Edition (38 pp., 3 figs; 2016) • ISBN 978-92-0-612816-9 • STI/PUB/1714 • €49.00

Chinese Edition (34 pp., 3 figs; 2016) • ISBN 978-92-0-510116-3 • STI/PUB/1714 • €49.00

English Edition (38 pp., 3 figs; 2016) • ISBN 978-92-0-109115-4 • STI/PUB/1714 • €49.00

French Edition (40 pp., 3 figs; 2017) • ISBN 978-92-0-212216-1 • STI/PUB/1714 • €49.00

Russian Edition (46 pp., 3 figs; 2016) • ISBN 978-92-0-408816-8 • STI/PUB/1714 • €49.00

Predisposal Management of Radioactive Waste

General Safety Requirements

IAEA Safety Standards Series No. GSR Part 5

There are a large number of facilities and activities around the world in which radioactive material is produced, handled and stored. This Safety Requirements publication presents international consensus requirements for the management of radioactive waste prior to its disposal. It provides the safety imperatives on the basis of which facilities can be designed, operated and regulated. The publication is supported by a number of Safety Guides that provide up to date recommendations and guidance on best practices for management of particular types of radioactive waste, for storage of radioactive waste, for assuring safety by developing safety cases and supporting safety assessments, and for applying appropriate management systems.

Arabic Edition (53 pp.; 2009) • ISBN 978-92-0-614309-4 • STI/PUB/1368 • €45.00

Chinese Edition (38 pp.; 2009) • ISBN 978-92-0-514109-1 • STI/PUB/1368 • €45.00

English Edition (38 pp.; 2009) • ISBN 978-92-0-111508-9 • STI/PUB/1368 • €45.00

French Edition (40 pp.; 2010) • ISBN 978-92-0-214609-9 • STI/PUB/1368 • €45.00

Russian Edition (46 pp.; 2010) • ISBN 978-92-0-415209-8 • STI/PUB/1368 • €45.00

Spanish Edition (44 pp.; 2010) • ISBN 978-92-0-314209-0 • STI/PUB/1368 • €45.00

Decommissioning of Facilities

General Safety Requirements

IAEA Safety Standards Series No. GSR Part 6

Decommissioning is the last step in the lifetime management of a facility. It must also be considered during the design, construction, commissioning and operation of facilities. This publication establishes requirements for the safe decommissioning of a broad range of facilities: nuclear power plants, research reactors, nuclear fuel cycle facilities, facilities for processing naturally occurring radioactive material, former military sites, and relevant medical, industrial and research facilities. It addresses all the aspects of decommissioning that are required to ensure safety, aspects such as roles and responsibilities, strategy and planning for decommissioning, conduct of decommissioning actions and termination of the authorization for decommissioning. It is intended for use by those involved in policy development, regulatory control and implementation of decommissioning.

Arabic Edition (25 pp., 2 figs; 2016) • ISBN 978-92-0-600216-2 • STI/PUB/1652 • €25.00

Chinese Edition (19 pp., 2 figs; 2015) • ISBN 978-92-0-510215-3 • STI/PUB/1652 • €25.00

English Edition (23 pp., 2 figs; 2014) • ISBN 978-92-0-102614-9 • STI/PUB/1652 • €25.00

French Edition (25 pp., 2 figs; 2017) • ISBN 978-92-0-205217-8 • STI/PUB/1652 • €25.00

Russian Edition (29 pp., 2 figs; 2015) • ISBN 978-92-0-404515-4 • STI/PUB/1652 • €25.00

Spanish Edition (25 pp., 2 figs; 2017) • ISBN 978-92-0-300417-6 • STI/PUB/1652 • €25.00

Preparedness and Response for a Nuclear or Radiological Emergency

General Safety Requirements

IAEA Safety Standards Series No. GSR Part 7

This publication, jointly sponsored by the FAO, IAEA, ICAO, ILO, IMO, INTERPOL, OECD/NEA, PAHO, CTBTO, UNEP, OCHA, WHO and WMO, is the new edition establishing the requirements for preparedness and response for a nuclear or radiological emergency which takes into account the latest experience and developments in the area. It supersedes the previous edition of the Safety Requirements for emergency preparedness and response, Safety Standards Series No. GS-R-2, which was published in 2002. This publication establishes the requirements for ensuring an adequate level of preparedness and response for a nuclear or radiological emergency, irrespective of its cause. These Safety Requirements are intended to be used by governments, emergency response organizations, other authorities at the local, regional and national levels, operating organizations and the regulatory body as well as by relevant international organizations at the international level.

Arabic Edition (109 pp., 2 figs; 2016) • ISBN 978-92-0-609816-5 • STI/PUB/1708 • €45.00

Chinese Edition (91 pp., 2 figs; 2016) • ISBN 978-92-0-506716-2 • STI/PUB/1708 • €45.00

English Edition (102 pp., 2 figs; 2015) • ISBN 978-92-0-105715-0 • STI/PUB/1708 • €45.00

French Edition (110 pp., 2 figs; 2017) • ISBN 978-92-0-205717-3 • STI/PUB/1708 • €45.00

Russian Edition (160 pp., 2 figs; 2016) • ISBN 978-92-0-408916-5 • STI/PUB/1708 • €45.00

Spanish Edition (112 pp., 2 figs; 2018) • ISBN 978-92-0-307517-6 • STI/PUB/1708 • €45.00

Classification of Radioactive Waste

General Safety Guide

IAEA Safety Standards Series No. GSG-1

This publication is a revision of an earlier Safety Guide of the same title issued in 1994. It recommends revised waste management strategies that reflect changes in practices and approaches since then. It sets out a classification system for the management of waste prior to disposal and for disposal, driven by long term safety considerations. It includes a number of schemes for classifying radioactive waste that can be used to assist with planning overall national approaches to radioactive waste management and to assist with operational management at facilities.

English Edition (48 pp., 2 figs; 2009) • ISBN 978-92-0-109209-0 • STI/PUB/1419 • €24.00

Russian Edition (54 pp., 2 figs; 2014) • ISBN 978-92-0-403514-8 • STI/PUB/1419 • €24.00

Spanish Edition (50 pp., 2 figs; 2015) • ISBN 978-92-0-307414-8 • STI/PUB/1419 • €24.00

Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency

General Safety Guide

IAEA Safety Standards Series No. GSG-2

This Safety Guide presents a coherent set of generic criteria (expressed numerically in terms of radiation dose) that form a basis for developing the operational levels needed for decision making concerning protective and response actions. The set of generic criteria addresses the requirements established in IAEA Safety Standards Series No. GS-R-2 for emergency preparedness and response, including lessons learned from responses to past emergencies, and provides an internally consistent foundation for the application of principles of radiation protection. The publication also provides a basis for a plain language explanation of the criteria for the public and for public officials.

Arabic Edition (108 pp.; 2012) • ISBN 978-92-0-629410-9 • STI/PUB/1467 • €41.00

English Edition (91 pp.; 2011) • ISBN 978-92-0-107410-2 • STI/PUB/1467 • €41.00

French Edition (102 pp.; 2012) • ISBN 978-92-0-224210-4 • STI/PUB/1467 • €41.00

Russian Edition (108 pp.; 2012) • ISBN 978-92-0-424810-4 • STI/PUB/1467 • €41.00

Spanish Edition (104 pp.; 2013) • ISBN 978-92-0-336310-5 • STI/PUB/1467 • €41.00

The Safety Case and Safety Assessment for the Predisposal Management of Radioactive Waste

General Safety Guide

IAEA Safety Standards Series No. GSG-3

This Safety Guide provides recommendations and guidance for the development and regulatory review of the safety case and supporting safety assessment throughout the lifetime of a facility. The recommendations and guidance provided in this Safety Guide can be used irrespective of how the safety case and safety assessment processes are addressed within national regulatory frameworks. It summarizes the most important considerations in assessing and demonstrating the safety of facilities and activities and recommends the steps that should be followed in developing the safety case and performing the safety assessment.

English Edition (151 pp., 11 figs; 2013) • ISBN 978-92-0-134810-4 • STI/PUB/1576 • €37.00

Use of External Experts by the Regulatory Body

General Safety Guide

IAEA Safety Standards Series No. GSG-4

This Safety Guide provides recommendations and guidance on meeting the requirements of IAEA Safety Standards Series No. GSR Part 1 on obtaining expert advice or services for the regulatory body. It informs the regulatory body on the process it should use to determine the need for external expert advice, and the processes and procedures for identifying a suitable support provider and making contractual arrangements for the work. It also provides recommendations and guidance on how the regulatory body should take the advice of external experts into account while still retaining responsibility in making its decisions.

English Edition (25 pp., 2 figs; 2013) • ISBN 978-92-0-135910-0 • STI/PUB/1583 • €25.00

Justification of Practices, Including Non-Medical Human Imaging

General Safety Guide

IAEA Safety Standards Series No. GSG-5

This Safety Guide was developed to assist governments and regulatory bodies with the assessment of particularly challenging proposals for the use of radiation; in particular, in human imaging for purposes other than medical diagnosis, medical treatment or biomedical research, such as for security screening at airports. It complements the guidance provided in the IAEA Safety Guide on the Regulatory Control of Radiation Sources. It provides guidance to governments and regulatory bodies on the elements that should be considered and the process that should be applied in determining whether the introduction of a particular type of practice is justified. It is intended to assist in the decision making process when confronted with a need or a request to authorize a novel type of practice or a need to review the justification of types of practice that are already established. The publication also provides some guidance to those wishing to demonstrate to the government or regulatory body that a particular type of practice is justified.

English Edition (57 pp., 2 figs; 2014) • ISBN 978-92-0-102414-5 • STI/PUB/1650 • €32.00

Spanish Edition (65 pp., 2 figs; 2018) • ISBN 978-92-0-309916-5 • STI/PUB/1650 • €32.00

Communication and Consultation with Interested Parties by the Regulatory Body

General Safety Guide

IAEA Safety Standards Series No. GSG-6

This Safety Guide provides recommendations on meeting the safety requirements concerning communication and consultation with the public and other interested parties by the regulatory body about the possible radiation risks associated with facilities and activities, and about processes and decisions of the regulatory body. The Safety Guide can be used by authorized parties in circumstances where there are regulatory requirements placed on them for communication and consultation. It may also be used by other organizations or individuals considering their responsibilities for communication and consultation with interested parties.

English Edition (45 pp.; 2017) • ISBN 978-92-0-102817-4 • STI/PUB/1784 • €30.00

Occupational Radiation Protection

General Safety Guide

IAEA Safety Standards Series No. GSG-7

This Safety Guide, prepared jointly by the International Atomic Energy Agency and the International Labour Organization, provides guidance on fulfilling the requirements of the International Basic Safety Standards (IAEA Safety Standards Series No. GSR Part 3) with respect to occupational exposure. It provides general guidance on the development of occupational radiation protection programmes as appropriate for the sources of radiation likely to be encountered in the workplaces in question to fulfil the management's responsibility for protection and safety. Detailed guidance is also provided on the monitoring and assessment of workers' exposure due to external radiation sources and from intakes of radionuclides. The Safety Guide reflects the current internationally accepted principles and recommended good practices in occupational radiation protection, with account taken of the conceptual changes and technological enhancements that have occurred over the past decade.

(Forthcoming) • ISBN 978-92-0-102917-1 • STI/PUB/1785 • €58.00

Radiation Protection of the Public and the Environment

General Safety Guide

IAEA Safety Standards Series No. GSG-8

This Safety Guide provides guidance on the implementation of the requirements in the International Basic Safety Standards, IAEA Safety Standards Series No. GSR Part 3, in relation to protection of the public and the environment against radiation risks. It provides generic guidance on the application of the radiation protection principles of justification, of optimization of protection and safety, and of dose limits. The publication covers the protection of the public and the environment in all exposure situations — planned, emergency and existing.

English Edition (51 pp.; 2018) • ISBN 978-92-0-102517-3 • STI/PUB/1781 • €40.00

Regulatory Control of Radioactive Discharges to the Environment

General Safety Guide

IAEA Safety Standards Series No. GSG-9

This Safety Guide is intended to assist governments, regulatory bodies, applicants for a licence and operating organizations with a structured approach to controlling radiation exposures of the public resulting from discharges from normal operations of facilities and activities, and with the optimization of protection and safety. More specifically, this publication addresses the process for authorization of discharges from new and modified facilities or activities, and the review of established authorizations. The guidance applies to different types of facilities, which range from nuclear installations to applications of radioisotopes in industry, medicine and research. It also covers the controllable releases to the environment in normal operation that may result from the mining and processing of ores for the extraction of uranium or thorium as part of the nuclear fuel cycle and discharges of naturally occurring radioactive material in non-nuclear industries.

(Forthcoming) • ISBN 978-92-0-102418-3 • STI/PUB/1818 • €42.00

Prospective Radiological Environmental Impact Assessment for Facilities and Activities

General Safety Guide

IAEA Safety Standards Series No. GSG-10

This Safety Guide provides recommendations and guidance on a general framework for performing prospective radiological impact assessments for facilities and activities, to estimate and control the radiological effects on the public and on the environment. This radiological environmental impact assessment is intended for planned exposure situations as part of the authorization process and, when applicable, as part of a governmental decision making process for facilities and activities. The situations covered in the assessment include both exposures expected to occur in normal operation as well as potential exposures. The assessment of the radiological impacts includes consideration of the risk of radiation effects for humans and for populations of non-human biota. Guidance is provided on the assumptions and input data to be used, the necessary models for environmental transfer and radiation dose assessment and the definition and use of criteria for informing decisions.

(Forthcoming) • ISBN 978-92-0-102518-0 • STI/PUB/1819 • €42.00

Arrangements for the Termination of a Nuclear or Radiological Emergency

General Safety Guide

IAEA Safety Standards Series No. GSG-11

This publication provides guidance and recommendations on arrangements to be made at the preparedness stage, as part of overall emergency preparedness, for the termination of a nuclear or radiological emergency and the subsequent transition from the emergency exposure situation to either a planned exposure situation or an existing exposure situation. It elaborates the prerequisites that need to be fulfilled so that responsible authorities can declare the nuclear or radiological emergency ended and it gives detailed guidance on adapting and lifting protective actions. This publication, jointly sponsored by 10 international organizations (FAO, IAEA, ICAO, ILO, IMO, INTERPOL, OECD/NEA, UN OCHA, WHO and WMO) is intended to assist Member States in the application of IAEA Safety Standards Series Nos GSR Part 3 and GSR Part 7.

English Edition (189 pp., 20 figs; 2018) • ISBN 978-92-0-108017-2 • STI/PUB/1796 • €53.00

Organization, Management and Staffing of the Regulatory Body for Safety

General Safety Guide

IAEA Safety Standards Series No. GSG-12

This publication provides recommendations on meeting the requirements of IAEA Safety Standards Series No. GSR Part 1 (Rev. 1), Governmental, Legal and Regulatory Framework for Safety, in respect of the organizational structure, management and staffing of the regulatory body. It addresses the arrangements and processes regulatory bodies need to consider in carrying out their responsibilities and functions efficiently and effectively and in an independent manner. It also provides guidance on how an integrated management system should be established and implemented in order to have in place both the core processes that help the regulatory body to perform its core functions, and the management and support processes that are necessary to run the regulatory body. The publication is intended for use by all regulatory bodies, irrespective of the size and type of facilities and activities they regulate.

English Edition (124 pp; 2018) • ISBN 978-92-0-100218-1 • STI/PUB/1801 • €50.00

Functions and Processes of the Regulatory Body for Safety

General Safety Guide

IAEA Safety Standards Series No. GSG-13

This Safety Guide provides recommendations on meeting the requirements of IAEA Safety Standards Series No. GSR Part 1 (Rev. 1), Governmental, Legal and Regulatory Framework for Safety, on the regulatory body's core functions and associated regulatory processes. This guidance is particularly important for regulatory bodies having responsibilities covering a range of facilities and activities that give rise to radiation risks and the important organizational interfaces between various regulatory authorities, which require effective coordination and cooperation. It promotes a consistent approach to regulation and specifically addresses the release of facilities and activities from regulatory control including sites, buildings, equipment and material. The publication is intended to be used mainly by regulatory bodies but will also be useful for governments that are developing a regulatory framework for safety. It will also assist authorized parties and others dealing with radiation sources in understanding regulatory procedures, processes and expectations.

English Edition (137 pp., 2 figs.; 2018) • ISBN 978-92-0-100718-6 • STI/PUB/1804 • €52.00

Arrangements for Preparedness for a Nuclear or Radiological Emergency

Safety Guide

IAEA Safety Standards Series No. GS-G-2.1

Under the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, one function of the IAEA is to collect and disseminate to States Parties and Member States information concerning methodologies, techniques and research data relating to emergency response. The primary objectives of this Safety Guide, co-sponsored by FAO, OCHA, ILO, PAHO and WHO, are to provide guidance on preparedness for and response to a nuclear or radiological emergency, to describe appropriate responses to a range of emergencies, and to provide background information on past experience, thereby helping the user to better implement arrangements that address the underlying issues.

English Edition (145 pp., 4 figs; 2007) • ISBN 92-0-109306-3 • STI/PUB/1265 • €31.00

Russian Edition (182 pp., 4 figs; 2016) • ISBN 978-92-0-405616-7 • STI/PUB/1265 • €31.00

Spanish Edition (165 pp., 4 figs; 2010) • ISBN 978-92-0-307310-3 • STI/PUB/1265 • €31.00

Application of the Management System for Facilities and Activities

Safety Guide

IAEA Safety Standards Series No. GS-G-3.1

This publication provides guidance for following the requirements for management systems that integrate safety, health, security, quality assurance and environmental objectives. A successful management system ensures that nuclear safety matters are not dealt with in isolation but are considered within the context of all these objectives. The aim of this publication is to assist Member States to establish and implement effective management systems that coherently integrate all aspects of managing nuclear facilities and activities.

English Edition (123 pp., 1 fig.; 2006) • ISBN 92-0-106606-6 • STI/PUB/1253 • €31.00

Russian Edition (116 pp., 1 fig.; 2009) • ISBN 978-92-0-401309-2 • STI/PUB/1253 • €31.00

Spanish Edition (109 pp., 1 fig.; 2016) • ISBN 978-92-0-307516-9 • STI/PUB/1253 • €31.00

The Management System for the Processing, Handling and Storage of Radioactive Waste

Safety Guide

IAEA Safety Standards Series No. GS-G-3.3

The objective of this Safety Guide is to provide guidance on the development and implementation of management systems for the pretreatment, treatment, conditioning and storage of radioactive waste. This publication also includes a description of how to apply the requirements detailed in IAEA Safety Standards Series No. GS-R-3, to the activities associated with producing a packaged waste form for storage and disposal.

English Edition (69 pp., 1 fig.; 2008) • ISBN 978-92-0-102008-6 • STI/PUB/1329 • €25.00

Russian Edition (80 pp., 1 fig.; 2015) • ISBN 978-92-0-404415-7 • STI/PUB/1329 • €25.00

Application of the Concepts of Exclusion, Exemption and Clearance

Safety Guide

IAEA Safety Standards Series No. RS-G-1.7

This Safety Guide provides guidance on the application of the concepts of exclusion, exemption and clearance as established in the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources. The Safety Guide includes specific values for activity concentrations for both radionuclides of natural origin and those of artificial origin that may be used for bulk amounts of material for the purposes of applying the concepts of exclusion and exemption.

Chinese Edition (29 pp.; 2006) • ISBN 92-0-502106-7 • STI/PUB/1202 • €16.00

English Edition (29 pp.; 2004) • ISBN 92-0-109404-3 • STI/PUB/1202 • €16.00

Russian Edition (31 pp.; 2006) • ISBN 92-0-403206-5 • STI/PUB/1202 • €16.00

Spanish Edition (30 pp.; 2007) • ISBN 92-0-300407-6 • STI/PUB/1202 • €16.00

Environmental and Source Monitoring for Purposes of Radiation Protection

Safety Guide

IAEA Safety Standards Series No. RS-G-1.8

The purpose of this Safety Guide is to provide international guidance, coherent with contemporary radiation protection principles and IAEA safety requirements, on the strategy of monitoring in relation to: (a) control of radionuclide discharges under practice conditions, and (b) intervention, such as in cases of nuclear or radiological emergencies or past contamination

of areas with long lived radionuclides. Three categories of monitoring are discussed: monitoring at the source of the discharge (source monitoring), monitoring in the environment (environmental monitoring) and monitoring of individual exposure in emergencies (individual monitoring). The Safety Guide also provides general guidance on assessment of the doses to critical groups of the population due to the presence of radioactive materials or radiation fields in the environment both from routine operation of nuclear and other related facilities (practice) and from nuclear or radiological emergencies and past contamination of areas with long lived radionuclides (intervention). The dose assessments are based on the results of source monitoring, environmental monitoring, individual monitoring or their combinations. This Safety Guide is primarily intended for use by national regulatory bodies and other agencies involved in national systems of radiation monitoring, as well as by operators of nuclear installations and other facilities where natural or human made radionuclides are treated and monitored.

English Edition (119 pp., 2 figs; 2005) • ISBN 92-0-113404-5 • STI/PUB/1216 • €26.00

Russian Edition (141 pp., 2 figs; 2016) • ISBN 978-92-0-405116-2 • STI/PUB/1216 • €26.00

Spanish Edition (131 pp., 2 figs; 2010) • ISBN 978-92-0-306010-3 • STI/PUB/1216 • €26.00

Categorization of Radioactive Sources

Safety Guide

IAEA Safety Standards Series No. RS-G-1.9

This Safety Guide provides a risk based ranking of radioactive sources and practices in five categories. The categorization system is based on a logical and transparent method that provides the flexibility for it to be applied in a wide range of circumstances. On the basis of this categorization, risk informed decisions can be made in a graded approach to the regulatory control of radioactive sources for the purposes of safety and security.

Arabic Edition (63 pp.; 2009) • ISBN 978-92-0-602309-9 • STI/PUB/1227 • €18.00

Chinese Edition (55 pp.; 2006) • ISBN 92-0-503506-8 • STI/PUB/1227 • €18.00

English Edition (55 pp.; 2005) • ISBN 92-0-103905-0 • STI/PUB/1227 • €18.00

French Edition (57 pp.; 2011) • ISBN 978-92-0-214810-9 • STI/PUB/1227 • €18.00

Russian Edition (57 pp.; 2006) • ISBN 92-0-404006-8 • STI/PUB/1227 • €18.00

Spanish Edition (57 pp.; 2009) • ISBN 978-92-0-301409-0 • STI/PUB/1227 • €18.00

Remediation Process for Areas Affected by Past Activities and Accidents

Safety Guide

IAEA Safety Standards Series No. WS-G-3.1

The objective of this Safety Guide is to provide guidance on implementing the requirements for the remediation of areas contaminated by past activities and accidents. It is intended to be used by regulatory bodies, operators and others responsible for remediating sites and, in the case of an accident, contributing to the recovery process. This publication provides recommendations for protective and remedial actions that are intended to reduce existing prolonged exposures due to contamination and to avert potential prolonged exposure or the likelihood of such exposure from related contamination.

English Edition (39 pp., 1 fig.; 2007) • ISBN 92-0-113306-5 • STI/PUB/1282 • €18.00

Spanish Edition (44 pp., 1 fig.; 2010) • ISBN 978-92-0-315009-5 • STI/PUB/1282 • €18.00

Release of Sites from Regulatory Control on Termination of Practices

Safety Guide

IAEA Safety Standards Series No. WS-G-5.1

An increasing number of nuclear facilities are coming to the end of their useful lives and are being, or are going to be, decommissioned with a view to removing the sites from regulatory control. In many cases, decommissioning activities include the decontamination of land, buildings and other structures such as underground pipes and tanks, or ponds, at the site that became contaminated as a result of an authorized practice. The objective of this Safety Guide is to provide guidance to the regulatory body and operators for the release of sites, or parts of sites, from regulatory control after a practice has been terminated. Such release may include cleanup of contaminated sites, and this Safety Guide also aims to provide guidance in this area.

English Edition (37 pp., 2 figs; 2006) • ISBN 92-0-101606-9 • STI/PUB/1244 • €27.00

Russian Edition (42 pp., 2 figs; 2008) • ISBN 978-92-0-404208-5 • STI/PUB/1244 • €27.00

Spanish Edition (39 pp., 2 figs; 2010) • ISBN 978-92-0-306510-8 • STI/PUB/1244 • €27.00

Safety Assessment for the Decommissioning of Facilities Using Radioactive Material

Safety Guide

IAEA Safety Standards Series No. WS-G-5.2

A large number of facilities using radioactive material, including nuclear power plants, research reactors, nuclear fuel cycle facilities, medical facilities and research facilities, are undergoing decommissioning now or will be decommissioned in the near future. Decommissioning of these facilities requires adequate evaluation of safety in accordance with the relevant safety requirements and criteria. This Safety Guide provides recommendations for the development and review of safety assessments for decommissioning activities. It is intended to assist regulators, operators and supporting technical specialists in the application of a graded approach to the development and review of safety assessments.

English Edition (62 pp., 4 figs; 2009) • ISBN 978-92-0-112308-4 • STI/PUB/1372 • €25.00

Russian Edition (66 pp., 4 figs; 2015) • ISBN 978-92-0-404215-3 • STI/PUB/1372 • €25.00

Spanish Edition (64 pp., 4 figs; 2012) • ISBN 978-92-0-333410-5 • STI/PUB/1372 • €25.00

Storage of Radioactive Waste

Safety Guide

IAEA Safety Standards Series No. WS-G-6.1

Radioactive waste is generated in a broad range of activities involving a wide variety of materials. The wastes arising from these activities have differing physical, chemical and radiological characteristics. This publication gives guidance on the storage of solid, liquid and gaseous radioactive wastes in a wide range of facilities, including those at which waste is generated, treated and conditioned.

English Edition (55 pp.; 2006) • ISBN 92-0-106706-2 • STI/PUB/1254 • €26.00

Russian Edition (62 pp.; 2008) • ISBN 978-92-0-404608-3 • STI/PUB/1254 • €26.00

Spanish Edition (61 pp.; 2009) • ISBN 978-92-0-310209-4 • STI/PUB/1254 • €26.00

Specific Safety Standards

Nuclear Power Plants

Safety of Nuclear Power Plants: Design

Specific Safety Requirements

IAEA Safety Standards Series No. SSR-2/1 (Rev. 1)

This publication establishes requirements applicable to the design of nuclear power plants and elaborates on the safety objective, safety principles and concepts that provide the basis for deriving the safety requirements that must be met for the design of a nuclear power plant. It will be useful for organizations involved in design, manufacture, construction, modification, maintenance, operation and decommissioning of nuclear power plants, as well as for regulatory bodies. A review of Safety Requirements publications was commenced in 2011 following the accident in the Fukushima Daiichi nuclear power plant in Japan. The review revealed no significant areas of weakness and resulted in just a small set of amendments to strengthen the requirements and facilitate their implementation, which are contained in the present publication.

Arabic Edition (68 pp., 2 figs; 2016) • ISBN 978-92-0-600217-9 • STI/PUB/1715 • €50.00

Chinese Edition (62 pp., 2 figs; 2016) • ISBN 978-92-0-509316-1 • STI/PUB/1715 • €50.00

English Edition (71 pp., 2 figs; 2016) • ISBN 978-92-0-109315-8 • STI/PUB/1715 • €50.00

French Edition (75 pp., 2 figs; 2017) • ISBN 978-92-0-208616-6 • STI/PUB/1715 • €50.00

Russian Edition (83 pp., 2 figs; 2016) • ISBN 978-92-0-409016-1 • STI/PUB/1715 • €50.00

Spanish Edition (75 pp., 2 figs; 2017) • ISBN 978-92-0-312916-9 • STI/PUB/1715 • €50.00

Safety of Nuclear Power Plants: Commissioning and Operation

Specific Safety Requirements

IAEA Safety Standards Series No. SSR-2/2 (Rev. 1)

This publication is a revision of IAEA Safety Standards Series No. NS-R-2, Safety of Nuclear Power Plants: Operation, and has been extended to cover the commissioning stage. It describes the requirements to be met to ensure the safe commissioning, operation, and transition from operation to decommissioning of nuclear power plants. Over recent years there have been developments in areas such as long term operation of nuclear power plants, plant ageing, periodic safety review, probabilistic safety analysis review and risk informed decision making processes. It became necessary to revise the IAEA's Safety Requirements in these areas and to correct and/or improve the publication on the basis of feedback from its application by both

the IAEA and its Member States. In addition, the requirements are governed by, and must apply, the safety objective and safety principles that are established in the IAEA Safety Standards Series No. SF-1, Fundamental Safety Principles. A review of Safety Requirements publications, initiated in 2011 following the accident in the Fukushima Daiichi nuclear power plant in Japan, revealed no significant areas of weakness but resulted in a small set of amendments to strengthen the requirements and facilitate their implementation. These are contained in the present publication.

Arabic Edition (48 pp., 2 figs; 2017) • ISBN 978-92-0-612416-1 • STI/PUB/1716 • €48.00
Chinese Edition (43 pp., 2 figs; 2016) • ISBN 978-92-0-509116-7 • STI/PUB/1716 • €48.00
English Edition (47 pp., 2 figs; 2016) • ISBN 978-92-0-109415-5 • STI/PUB/1716 • €48.00
French Edition (49 pp., 2 figs; 2016) • ISBN 978-92-0-208316-5 • STI/PUB/1716 • €48.00
Russian Edition (58 pp., 2 figs; 2017) • ISBN 978-92-0-408716-1 • STI/PUB/1716 • €48.00
Spanish Edition (51 pp., 2 figs; 2018) • ISBN 978-92-0-300117-5 • STI/PUB/1716 • €48.00

Site Evaluation for Nuclear Installations

Safety Requirements

IAEA Safety Standards Series No. NS-R-3 (Rev. 1)

This publication establishes requirements and provides criteria for ensuring safety in site evaluation for nuclear installations. The Safety Guides on site evaluation listed in the references section provide recommendations on how to meet the requirements established in this publication. A review of Safety Requirements publications was commenced in 2011 following the accident in the Fukushima Daiichi nuclear power plant in Japan. The review revealed no significant areas of weakness and resulted in just a small set of amendments to strengthen the requirements and facilitate their implementation, which are contained in the present publication.

Arabic Edition (29 pp., 2 figs; 2016) • ISBN 978-92-0-610016-5 • STI/PUB/1709 • €35.00
Chinese Edition (25 pp., 2 figs; 2016) • ISBN 978-92-0-509416-8 • STI/PUB/1709 • €35.00
English Edition (27 pp., 2 figs; 2016) • ISBN 978-92-0-106515-5 • STI/PUB/1709 • €35.00
French Edition (29 pp., 2 figs; 2016) • ISBN 978-92-0-208116-1 • STI/PUB/1709 • €35.00
Russian Edition (33 pp., 2 figs; 2016) • ISBN 978-92-0-409216-5 • STI/PUB/1709 • €35.00
Spanish Edition (29 pp., 2 figs; 2017) • ISBN 978-92-0-310216-2 • STI/PUB/1709 • €35.00

The Management System for Nuclear Installations

Safety Guide

IAEA Safety Standards Series No. GS-G-3.5

This Safety Guide has been issued in support of the Safety Requirements publication on the Management System

for Facilities and Activities, IAEA Safety Standards Series No. GS-R-3. It contains detailed recommendations in relation to nuclear installations, to complement the general recommendations provided in IAEA Safety Standards Series No. GS-G-3.1. This Safety Guide is applicable throughout the lifetime of a nuclear installation, including site evaluation, design, construction, commissioning, operation, and decommissioning.

English Edition (139 pp., 5 figs; 2009) • ISBN 978-92-0-103409-0 • STI/PUB/1392 • €35.00

Russian Edition (160 pp., 5 figs; 2014) • ISBN 978-92-0-400614-8 • STI/PUB/1392 • €35.00

Spanish Edition (153 pp., 5 figs; 2017) • ISBN 978-92-0-307916-7 • STI/PUB/1392 • €35.00

Format and Content of the Safety Analysis Report for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. GS-G-4.1

This Safety Guide provides recommendations and guidance on the possible format and content of safety analysis reports (SARs) to be developed in support of requests to regulatory bodies for authorization to construct and/or to operate a nuclear power plant. As such, this Safety Guide recommends how to meet the requirements for preparation of adequate safety demonstrations as established in IAEA Safety Standards Series No. GS-R-1, Safety Requirements on Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety, and complements IAEA Safety Standards Series No. NS-G-1.2, Safety Guide, Safety Assessment and Verification of Nuclear Power Plants.

Chinese Edition (71 pp.; 2006) • ISBN 92-0-502306-X • STI/PUB/1185 • €22.00

English Edition (81 pp.; 2004) • ISBN 92-0-115203-5 • STI/PUB/1185 • €22.00

Design of Fuel Handling and Storage Systems for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-1.4

The purpose of this Safety Guide is to provide detailed recommendations for the design of fuel handling and storage systems in nuclear power plants. This publication is intended for use by organizations designing, manufacturing, constructing and operating fuel handling and storage facilities in nuclear power plants, as well as by regulatory bodies.

English Edition (53 pp., 4 figs; 2003) • ISBN 92-0-107803-X • STI/PUB/1156 • €16.50

Russian Edition (59 pp., 4 figs; 2005) • ISBN 92-0-410805-3 • STI/PUB/1156 • €16.50

Spanish Edition (61 pp., 4 figs; 2008) • ISBN 978-92-0-309108-4 • STI/PUB/1156 • €16.50

External Events Excluding Earthquakes in the Design of Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-1.5

This Safety Guide provides recommendations and guidance on design for the protection of nuclear power plants from the effects of external events (excluding earthquakes), i.e. events that originate either off the site or within the boundaries of the site but from sources that are not directly involved in the operational states of the nuclear power plant units. In addition, it provides recommendations on engineering related matters in order to comply with the safety objectives and requirements established in the IAEA Safety Requirements publication, Safety of Nuclear Power Plants: Design. It is also applicable to the design and safety assessment of items important to the safety of land based stationary nuclear power plants with water cooled reactors.

English Edition (105 pp., 15 figs; 2003) • ISBN 92-0-113603-X • STI/PUB/1159 • €27.00

Russian Edition (127 pp., 15 figs; 2008) • ISBN 978-92-0-403308-3 • STI/PUB/1159 • €27.00

Seismic Design and Qualification for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-1.6

This Safety Guide provides recommendations on a generally accepted way to design a nuclear power plant so that an earthquake motion at the site will not jeopardize the safety of the plant. It also gives guidance on a consistent application of methods and procedures for analysis, testing and qualification of structures and equipment so that they meet the safety requirements covering the design of nuclear power plants, safety assessments for the design and the regulatory issues concerned with the licensing of plants.

English Edition (59 pp., 3 figs; 2003) • ISBN 92-0-110703-X • STI/PUB/1158 • €17.50

Russian Edition (67 pp., 3 figs; 2008) • ISBN 978-92-0-404308-2 • STI/PUB/1158 • €17.50

Protection Against Internal Fires and Explosions in the Design of Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-1.7

Safety Guide NS-G-1.7 is a revision of an earlier Safety Guide, Safety Series No. 50-SG-D2. This and other Safety Guides

recommend how to meet the design requirements established in Safety Standards Series No. NS-R-1, Safety of Nuclear Power Plants: Design. Its technical content is based on the most recent operating experience and has been extended to cover the design of plants in relation to internal explosions. The appendices provide guidance for the design and upgrading of fire detection and suppression systems.

English Edition (63 pp., 2 figs; 2004) • ISBN 92-0-103304-4 • STI/PUB/1186 • €15.00

Russian Edition (71 pp., 2 figs; 2008) • ISBN 978-92-0-402908-6 • STI/PUB/1186 • €15.00

Design of the Reactor Coolant System and Associated Systems in Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-1.9

This publication is a revision and combination of two previous Safety Guides: Safety Series No. 50-SG-D6, Ultimate Heat Sink and Directly Associated Heat Transport Systems for Nuclear Power Plants (1981), and Safety Series No. 50-SG-D13, Reactor Coolant and Associated Systems in Nuclear Power Plants (1986). The revision takes account of developments in the design of the reactor coolant and associated systems in nuclear power plants since the earlier safety guides were published. The other objectives of the revision are to ensure consistency with the Requirements for Design, issued in 2000, and to update the technical content. In addition, an appendix on pressurized heavy water reactors has been included.

English Edition (79 pp., 4 figs; 2004) • ISBN 92-0-103404-0 • STI/PUB/1187 • €18.00

Russian Edition (87 pp., 4 figs; 2008) • ISBN 978-92-0-403008-2 • STI/PUB/1187 • €18.00

Spanish Edition (83 pp., 4 figs; 2010) • ISBN 978-92-0-306910-6 • STI/PUB/1187 • €18.00

Design of Reactor Containment Systems for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-1.10

The purpose of this Safety Guide is to provide recommendations for the design of the containment systems in nuclear power plants in compliance with the safety objectives and requirements established in Safety Standards Series No. NS-R-1, Safety of Nuclear Power Plants: Design. Management of energy, radionuclides and combustible gases is considered. This publication is intended for use by organizations designing, manufacturing, constructing and operating nuclear power plants, as well as by regulatory bodies.

English Edition (127 pp., 11 figs; 2004) • ISBN 92-0-103604-3 • STI/PUB/1189 • €18.00

Russian Edition (131 pp., 11 figs; 2008) • ISBN 978-92-0-402408-1 • STI/PUB/1189 • €18.00

Protection against Internal Hazards other than Fires and Explosions in the Design of Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-1.11

This publication is a revision of the former safety standards given in Safety Series No. 50-SG-D4, dealing with protection against missiles and the consequences for the safety of nuclear power plants. This revised publication also includes other internal hazards: collapse of structures and falling objects, pipe whips, jet effects and flooding.

English Edition (43 pp.; 2004) • ISBN 92-0-104904-8 • STI/PUB/1191 • €20.00

Design of the Reactor Core for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-1.12

This publication makes recommendations concerning safety features for incorporation into the design of the reactor core for a nuclear power plant and includes guidance on general and specific design considerations.

Chinese Edition (57 pp.; 2006) • ISBN 92-0-502206-3 • STI/PUB/1221 • €23.00

English Edition (59 pp.; 2005) • ISBN 92-0-116004-6 • STI/PUB/1221 • €23.00

Russian Edition (71 pp.; 2006) • ISBN 92-0-403706-7 • STI/PUB/1221 • €23.00

Radiation Protection Aspects of Design for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-1.13

Prepared as part of the IAEA programme on safety standards for nuclear power plants (NPPs), this Safety Guide deals with the provisions that should be made in the design of NPPs to protect site personnel, the public and the environment against radiological hazards in operational states, decommissioning and accident conditions, including severe accidents. It also provides recommendations for ensuring radiation protection in the design of new NPPs, design modifications to operating plants, and safety reviews of operating NPPs. Comprehensive annexes provide additional information on the subjects addressed in this Safety Guide.

English Edition (115 pp., 4 figs; 2005) • ISBN 92-0-107905-2 • STI/PUB/1233 • €22.00

Russian Edition (131 pp., 4 figs; 2008) • ISBN 978-92-0-404908-4 • STI/PUB/1233 • €22.00

Fire Safety in the Operation of Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-2.1

This Safety Guide provides recommendations on how to meet the requirements for achieving and maintaining fire safety in the management and operation of a nuclear power plant throughout its lifetime, covering topics including fire prevention, control of combustible materials and ignition sources, manual fire fighting, training and quality assurance. The requirements for fire safety are established in IAEA Safety Standards Series No. NS-R-2, Safety of Nuclear Power Plants: Operation. The publication is intended for plant managers, operators, safety assessors and regulators. Recommendations are made concerning organization and responsibilities, periodic updating of the fire hazard analysis, modifications relating to fire safety, inspection, maintenance and testing of fire safety features, records and documentation, the adoption of a formal policy for fire safety, and specific responsibilities and authorities of staff in relation to fire safety.

Chinese Edition (27 pp.; 2005) • ISBN 92-0-514005-8 • STI/PUB/1091 • €12.50

English Edition (34 pp.; 2000) • ISBN 92-0-100900-3 • STI/PUB/1091 • €12.50

French Edition (41 pp.; 2004) • ISBN 92-0-201904-5 • STI/PUB/1091 • €12.50

Russian Edition (43 pp.; 2004) • ISBN 92-0-401504-7 • STI/PUB/1091 • €12.50

Operational Limits and Conditions and Operating Procedures for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-2.2

This Safety Guide provides guidance on the development, content and use of operational limits and conditions (limits on plant operating parameters) and operating procedures that affect them. It recommends how to meet the requirements established in IAEA Safety Standards Series No. NS-R-2, Safety of Nuclear Power Plants: Operation, setting out the responsibilities of the operating organization in setting, modifying and documenting operational limits and conditions and ensuring compliance with them.

Chinese Edition (36 pp., 2 figs; 2005) • ISBN 92-0-514105-4 • STI/PUB/1100 • €14.50

English Edition (41 pp., 2 figs; 2000) • ISBN 92-0-102000-7 • STI/PUB/1100 • €14.50

French Edition (47 pp., 2 figs; 2005) • ISBN 92-0-207205-1 • STI/PUB/1100 • €14.50

Russian Edition (45 pp., 2 figs; 2004) • ISBN 92-0-401704-X • STI/PUB/1100 • €14.50

Spanish Edition (47 pp., 2 figs; 2009) • ISBN 978-92-0-313109-4 • STI/PUB/1100 • €14.50

Modifications to Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-2.3

This Safety Guide provides recommendations and guidance on controlling activities relating to modifications to nuclear power plants so as to reduce risk and to ensure that the configuration of the plant is under control at all times, and that the modified configuration conforms to the approved basis for granting an operation licence. The recommendations cover the whole process from conception to completion for modifications to structures, systems and components, operational limits and conditions, procedures and software, and the management systems and tools for plant operation. This publication recommends how to meet the requirements established in the IAEA Safety Standards Series No. NS-R-2, Safety of Nuclear Power Plants: Operation.

Chinese Edition (27 pp., 1 fig.; 2005) • ISBN 92-0-516904-8 • STI/PUB/1111 • €12.50

English Edition (33 pp., 1 fig.; 2001) • ISBN 92-0-101501-1 • STI/PUB/1111 • €12.50

French Edition (41 pp., 1 fig.; 2005) • ISBN 92-0-202804-4 • STI/PUB/1111 • €12.50

Russian Edition (41 pp., 1 fig.; 2004) • ISBN 92-0-402904-8 • STI/PUB/1111 • €12.50

Spanish Edition (37 pp., 1 fig.; 2007) • ISBN 92-0-300307-X • STI/PUB/1111 • €12.50

The Operating Organization for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-2.4

This Safety Guide provides recommendations on setting up an operating organization for nuclear power plants so as to facilitate their safe operation, and on the organizational elements necessary for a strong safety culture and an international level of performance. The Safety Guide highlights the important elements of effective management in relation to nuclear safety, quality assurance, the management of radioactive waste and radiological protection, and in meeting the associated national regulatory requirements. It recommends how to meet the requirements established in IAEA Safety Standards Series No. NS-R-2, Safety of Nuclear Power Plants: Operation.

Chinese Edition (42 pp.; 2005) • ISBN 92-0-516804-1 • STI/PUB/1115 • €14.50

English Edition (53 pp.; 2002) • ISBN 92-0-102301-4 • STI/PUB/1115 • €14.50

French Edition (62 pp.; 2005) • ISBN 92-0-206805-4 • STI/PUB/1115 • €14.50

Russian Edition (69 pp.; 2004) • ISBN 92-0-401604-3 • STI/PUB/1115 • €14.50

Core Management and Fuel Handling for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-2.5

This Safety Guide supplements and elaborates upon the safety requirements for core management and fuel handling established in Section 5 of IAEA Safety Standards Series No. NS-R-2, Safety of Nuclear Power Plants: Operation. It also relates to IAEA Safety Standards Series No. NS-G-2.4, The Operating Organization for Nuclear Power Plants, which identifies fuel management as one of the functions to be performed by the operating organization.

English Edition (43 pp.; 2002) • ISBN 92-0-111002-2 • STI/PUB/1125 • €14.00

Russian Edition (55 pp.; 2004) • ISBN 92-0-404204-4 • STI/PUB/1125 • €14.00

Maintenance, Surveillance and In-service Inspection in Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-2.6

This Safety Guide provides recommendations and guidance for effective maintenance, surveillance and in-service inspection to ensure that the levels of reliability and availability of all plant

structures, systems and components meet the assumptions and intent of the design. It supplements Section 6 of IAEA Safety Standards Series No. NS-R-2, Safety of Nuclear Power Plants: Operation.

English Edition (74 pp.; 2002) • ISBN 92-0-115702-9 • STI/PUB/1136 • €20.50

Russian Edition (91 pp.; 2005) • ISBN 92-0-406505-2 • STI/PUB/1136 • €20.50

Recruitment, Qualification and Training of Personnel for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-2.8

This Safety Guide provides recommendations on the recruitment, selection, qualification, training and authorization of personnel working in all safety related functions and at all levels of nuclear power plants. It supplements IAEA Safety Standards Series No. NS-R-2, Safety of Nuclear Power Plants: Operation and is related to IAEA Safety Standards Series No. NS-G-2.4, The Operating Organization for Nuclear Power Plants.

English Edition (49 pp.; 2002) • ISBN 92-0-117902-2 • STI/PUB/1140 • €15.50

Russian Edition (57 pp.; 2005) • ISBN 92-0-411805-9 • STI/PUB/1140 • €15.50

Evaluation of Seismic Safety for Existing Nuclear Installations

Safety Guide

IAEA Safety Standards Series No. NS-G-2.13

This Safety Guide provides recommendations regarding the criteria and methodologies to be used for seismic safety evaluation of existing nuclear installations, including installations whose purpose and associated radiological risks have changed, installations where longer term operation is under consideration and installations where comprehensive seismic safety reassessments have become necessary. Two methodologies are discussed in detail: deterministic seismic margin assessment (SMA) and seismic probabilistic safety assessment (SPSA).

English Edition (84 pp.; 2009) • ISBN 978-92-0-100409-3 • STI/PUB/1379 • €20.00

Russian Edition (76 pp.; 2014) • ISBN 978-92-0-401314-6 • STI/PUB/1379 • €20.00

Conduct of Operations at Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-2.14

This Safety Guide identifies the main responsibilities and practices of nuclear power plant operations departments in relation to their responsibility for the safe functioning of the plant. The guide presents the factors to be considered in structuring the operations department of a nuclear power plant; setting high standards of performance; making safety related decisions in an effective manner; conducting control room and field activities in a thorough and professional manner; and maintaining a nuclear power plant within established operational limits and conditions.

English Edition (55 pp.; 2008) • ISBN 978-92-0-105408-1 • STI/PUB/1339 • €19.00

Russian Edition (68 pp.; 2009) • ISBN 978-92-0-412508-5 • STI/PUB/1339 • €19.00

Spanish Edition (61 pp.; 2012) • ISBN 978-92-0-329710-3 • STI/PUB/1339 • €19.00

Severe Accident Management Programmes for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-2.15

This Safety Guide provides recommendations for the development of accident management programmes to prevent, and to mitigate the consequences of beyond design basis accidents, including severe accidents. Although primarily developed for use for light water reactors, the recommendations are valid for a wide range of nuclear reactors, both existing and new.

English Edition (66 pp., 1 fig.; 2009) • ISBN 978-92-0-112908-6 • STI/PUB/1376 • €25.00

Russian Edition (78 pp., 1 fig.; 2014) • ISBN 978-92-0-401614-7 • STI/PUB/1376 • €25.00

Spanish Edition (72 pp., 1 fig.; 2016) • ISBN 978-92-0-310115-8 • STI/PUB/1376 • €25.00

External Human Induced Events in Site Evaluation for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-3.1

This Safety Guide recommends actions, conditions and procedures in relation to external human induced events and provides guidance for fulfilling the requirements of IAEA Safety Standards Series No. NS-R-3, Site Evaluation for Nuclear Installations, when conducting a site evaluation for a nuclear power plant.

Chinese Edition (41 pp., 1 fig.; 2005) • ISBN 92-0-514205-0 • STI/PUB/1126 • €14.50

English Edition (49 pp., 1 fig.; 2002) • ISBN 92-0-111202-5 • STI/PUB/1126 • €14.50

French Edition (55 pp., 1 fig.; 2006) • ISBN 92-0-212705-0 • STI/PUB/1126 • €14.50

Russian Edition (61 pp., 1 fig.; 2004) • ISBN 92-0-402304-X • STI/PUB/1126 • €14.50

Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-3.2

This Safety Guide deals with consideration of the potential effects of a nuclear power plant on the environment and of the population distribution in the surrounding area in site evaluation for a nuclear power plant. It supplements IAEA Safety Standard No. NS-R-3, Site Evaluation for Nuclear Installations.

English Edition (32 pp.; 2002) • ISBN 92-0-110102-3 • STI/PUB/1122 • €11.50

Russian Edition (41 pp.; 2004) • ISBN 92-0-404304-0 • STI/PUB/1122 • €11.50

Geotechnical Aspects of Site Evaluation and Foundations for Nuclear Power Plants

Safety Guide

IAEA Safety Standards Series No. NS-G-3.6

This publication is a revision of the former safety standards of IAEA Safety Series No. 50-SG-S8. The scope has been extended to cover not only foundations but also design questions related to geotechnical science and engineering, such as the bearing capacity of foundations, design of earth structures and design of buried structures.

Chinese Edition (49 pp.; 2006) • ISBN 92-0-501906-2 • STI/PUB/1195 • €19.00

English Edition (53 pp.; 2005) • ISBN 92-0-107204-X • STI/PUB/1195 • €19.00

Russian Edition (60 pp.; 2005) • ISBN 92-0-400106-2 • STI/PUB/1195 • €19.00

Deterministic Safety Analysis for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-2

The objective of this Safety Guide is to provide harmonized guidance to designers, operators, regulators and providers of technical support on deterministic safety analysis for nuclear power plants. It provides information on the utilization of the results of such analysis for safety and reliability improvements. The Safety Guide addresses conservative, best estimate and uncertainty evaluation approaches to deterministic safety analysis and is applicable to current and future designs.

English Edition (62 pp., 2 figs; 2010) • ISBN 978-92-0-113309-0 • STI/PUB/1428 • €23.00

Russian Edition (72 pp., 2 figs; 2014) • ISBN 978-92-0-401814-1 • STI/PUB/1428 • €23.00

Spanish Edition (66 pp., 2 figs; 2012) • ISBN 978-92-0-333010-7 • STI/PUB/1428 • €23.00

Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-3

The objective of this Safety Guide is to provide recommendations for meeting the IAEA safety requirements in performing or managing a level 1 probabilistic safety assessment (PSA) project for a nuclear power plant. These recommendations promote technical consistency among level 1 PSA studies and support applications of PSA and risk informed decision making.

The Safety Guide's scope encompasses all operational conditions of the plant and potential initiating events and hazards.

English Edition (195 pp., 8 figs; 2010) • ISBN 978-92-0-114509-3 • STI/PUB/1430 • €35.00

Russian Edition (218 pp., 8 figs; 2014) • ISBN 978-92-0-406014-0 • STI/PUB/1430 • €35.00

Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-4

The objective of this Safety Guide is to provide recommendations for meeting the IAEA safety requirements in performing or managing a level 2 probabilistic safety assessment (PSA) project for a nuclear power plant; thus it complements the Safety Guide on level 1 PSA. One of the aims of this Safety Guide is to promote a standard framework, standard terms and a standard set of documents for level 2 PSAs to facilitate regulatory and external peer review of their results. It describes all elements of the level 2 PSA that need to be carried out if the starting point is a fully comprehensive level 1 PSA.

English Edition (88 pp., 3 figs; 2010) • ISBN 978-92-0-102210-3 • STI/PUB/1443 • €22.00

Russian Edition (100 pp., 3 figs; 2014) • ISBN 978-92-0-404614-4 • STI/PUB/1443 • €22.00

Seismic Hazards in Site Evaluation for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-9

This Safety Guide provides updated guidance for site evaluation in relation to seismic hazards. It takes account of recently gained knowledge and experience of seismic hazards in Member States, presents recent findings associated with strong motion recordings from seismically active and well instrumented areas such as Japan and California in the USA, includes experience gained from significant recent earthquakes and provides clear guidance for existing as well as new build projects. It also addresses the need to expand the evaluation of seismic hazards to nuclear installations other than nuclear power plants.

English Edition (56 pp.; 2010) • ISBN 978-92-0-102910-2 • STI/PUB/1448 • €29.00

Licensing Process for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-12

This Safety Guide describes how the licensing process should be applied at the various stages of the lifetime of a nuclear installation, with discussion of topics and required documents to be considered at each stage. Recommendations on the application by a regulatory body of a graded approach in the licensing process are also provided. It also describes the processes that should be undertaken to meet the regulatory and legal requirements in a Member State to authorize the establishment of a nuclear installation and/or initiation of its activities. While this Safety Guide focuses on safety at nuclear installations, it is noted that integration of safety and security aspects should be considered and evaluated by the regulatory body in the licensing process.

English Edition (62 pp.; 2010) • ISBN 978-92-0-107510-9 • STI/PUB/1468 • €27.00

Spanish Edition (70 pp.; 2011) • ISBN 978-92-0-318410-6 • STI/PUB/1468 • €27.00

Chemistry Programme for Water Cooled Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-13

This publication provides guidance on establishing a high standard chemistry programme in accordance with plant safety policy and regulatory requirements. It will be useful to managers of operating organizations and other staff responsible for supporting or monitoring plant activities and for oversight of the plant chemistry programme, as well as to regulatory bodies.

English Edition (46 pp.; 2011) • ISBN 978-92-0-107610-6 • STI/PUB/1469 • €25.00

Russian Edition (52 pp.; 2014) • ISBN 978-92-0-400914-9 • STI/PUB/1469 • €25.00

Establishing the Safety Infrastructure for a Nuclear Power Programme

Specific Safety Guide

IAEA Safety Standards Series No. SSG-16

This Safety Guide provides guidance on the establishment of a national nuclear safety infrastructure as a key component of the overall preparations required for emerging nuclear power programmes. It provides recommendations, presented in the form of 200 sequential actions, on meeting the applicable IAEA safety requirements during the first three phases of the development of a nuclear power programme. It is intended for

use by persons or organizations participating in the preparation and implementation of a nuclear power programme, including government officials and legislative bodies, regulatory bodies, operating organizations and external support entities.

English Edition (158 pp., 7 figs; 2012) • ISBN 978-92-0-115310-4 • STI/PUB/1507 • €40.00

Russian Edition (188 pp., 7 figs; 2015) • ISBN 978-92-0-405614-3 • STI/PUB/1507 • €40.00

Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-18

This IAEA Safety Guide, which is jointly sponsored by the World Meteorological Organization, provides recommendations and guidance on how to comply with the safety requirements on assessing hazards associated with meteorological and hydrological phenomena. It includes the state of practice in the international community for dealing with these external natural hazards, considering the lessons learned from recent catastrophic events as well as from new findings on climate variability. Furthermore, this publication provides recommendations on how to determine the corresponding design basis for these natural hazards, and recommends measures for protection of the site of a nuclear installation against hazards of this type. This Safety Guide is intended for use by regulatory bodies, designers of nuclear installations and operating organizations responsible for the safety of installations and for the protection of people and the environment from harmful effects of ionizing radiation.

English Edition (146 pp., 4 figs; 2011) • ISBN 978-92-0-115210-7 • STI/PUB/1506 • €38.00

Volcanic Hazards in Site Evaluation for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-21

This publication provides comprehensive and updated guidance for site evaluation in relation to volcanic hazards. It includes recommendations on assessing the volcanic hazards at a nuclear installation site, in order to identify and characterize, in a comprehensive manner, all potentially hazardous phenomena that may be associated with future volcanic events. It describes how some of these volcanic phenomena may affect the acceptability of the selected site, resulting in exclusion of a site or determining the corresponding design basis parameters for the installation. This Safety Guide is applicable to both existing and new sites, and a graded approach is recommended to cater for all types of nuclear installation.

English Edition (106 pp., 2 figs; 2012) • ISBN 978-92-0-128110-4 • STI/PUB/1552 • €30.00

Periodic Safety Review for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-25

This Safety Guide provides recommendations and guidance on conducting periodic safety review (PSR) of an existing nuclear power plant. PSR is a comprehensive safety review of all important aspects of safety, carried out at regular intervals, typically every ten years. In addition, PSR may be used in support of the decision making process for licence renewal or long term operation, or for restart of a nuclear power plant following a prolonged shutdown. The review process described in this Safety Guide is valid for nuclear power plants of any age and may have a wider applicability, for example to research reactors and radioactive waste management facilities, by means of a graded approach. Although PSR may not be an appropriate means for identifying safety issues in the decommissioning phase, the documentation resulting from PSR of an operating nuclear power plant will be an important input when planning decommissioning.

English Edition (106 pp., 5 figs; 2013) • ISBN 978-92-0-137410-3 • STI/PUB/1588 • €37.00

Russian Edition (126 pp., 5 figs; 2016) • ISBN 978-92-0-405416-3 • STI/PUB/1588 • €37.00

Criticality Safety in the Handling of Fissile Material

Specific Safety Guide

IAEA Safety Standards Series No. SSG-27

This Safety Guide provides guidance and recommendations on how to meet the relevant requirements for ensuring subcriticality when dealing with fissile material and for planning the response to criticality accidents. The guidance and recommendations are applicable to both regulatory bodies and operating organizations. The objectives of criticality safety are to prevent a self-sustained nuclear chain reaction and to minimize the consequences of this if it were to occur. The Safety Guide makes recommendations on how to ensure subcriticality in systems involving fissile materials during normal operation, anticipated operational occurrences, and, in the case of accident conditions, within design basis accidents, from initial design through commissioning, operation, and decommissioning and disposal.

English Edition (77 pp., 2 figs; 2014) • ISBN 978-92-0-140010-9 • STI/PUB/1594 • €40.00

Commissioning for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-28

This Safety Guide provides recommendations on the basis of international best practices, as currently followed in IAEA Member States, on how to meet commissioning requirements for nuclear power plants. These requirements enable the commissioning of a nuclear power plant to proceed safely and to a high quality. The recommendations will also enable the necessary assurances to be provided that the plant has been constructed in accordance with the design intent and can be operated safely.

English Edition (84 pp., 2 figs; 2014) • ISBN 978-92-0-140110-6 • STI/PUB/1595 • €40.00

Russian Edition (104 pp., 2 figs; 2016) • ISBN 978-92-0-406016-4 • STI/PUB/1595 • €40.00

Safety Classification of Structures, Systems and Components in Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-30

This Safety Guide provides recommendations and guidance on how to meet the requirements established in Specific Safety Requirements No. SSR-2/1 and in General Safety Requirements No. GSR Part 4 for the identification of structures, systems and components important to safety in nuclear power plants and for their classification on the basis of their function and safety significance. This Safety Guide is intended primarily for use by organizations involved in the design of nuclear power plants, as well as by regulatory bodies and their technical support organizations. The Safety Guide can also be applied to other nuclear installations subject to appropriate adjustments relevant to the specific design of the type of the facility being considered.

English Edition (24 pp., 2 figs; 2014) • ISBN 978-92-0-115413-2 • STI/PUB/1639 • €22.00

Design of Electrical Power Systems for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-34

This Safety Guide provides recommendations on the necessary characteristics of electrical power systems for nuclear power plants, and of the processes for developing these systems, in order to meet the safety requirements of IAEA Safety Standards Series No. SSR-2/1 (Rev. 1). It reflects the changes that have been made to SSR-2/1, in particular to Requirement 68 on emergency power supply.

English Edition (120 pp., 9 figs; 2016) • ISBN 978-92-0-109314-1 • STI/PUB/1673 • €47.00

Site Survey and Site Selection for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-35

This publication was prepared under the IAEA's programme for Safety Standards and complements other Safety Guides that deal with all safety considerations in site evaluation regarding the effects of external events and population distribution. It supplements and provides recommendations on meeting the requirements for nuclear installations established in the Safety Requirements publication on Site Evaluation for Nuclear

Installations (IAEA Safety Standards Series No. NS-R-3) in terms of the safety aspects to be considered during the stages of the selection process of a site for a nuclear installation.

English Edition (61 pp., 5 figs; 2015) • ISBN 978-92-0-102415-2 • STI/PUB/1690 • €31.00

Construction for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-38

This Safety Guide provides recommendations and guidance based on international good practices in the construction of nuclear installations, which will enable construction to proceed with high quality. It can be applied to support the development, implementation and assessment of construction methods and procedures and the identification of good practices for ensuring the quality of the construction to meet the design intent and ensure safety. It will be a useful tool for regulatory bodies, licensees and new entrant countries introducing nuclear power plants and other nuclear installations.

English Edition (46 pp., 3 figs; 2015) • ISBN 978-92-0-102715-3 • STI/PUB/1693 • €42.00

Design of Instrumentation and Control Systems for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-39

This publication is a revision and combination of two Safety Guides, IAEA Safety Standards Series No. NS-G-1.1 and No. NS-G-1.3. The revision takes into account developments in instrumentation and control (I&C) systems since the publication of the earlier Safety Guides. The main changes relate to the continuing development of computer applications and the evolution of the methods necessary for their safe, secure and practical use. In addition, account is taken of developments in human factors engineering and the need for computer security. This Safety Guide also references and takes into account other IAEA Safety Standards and IAEA Nuclear Security Series publications that provide guidance relating to I&C design.

English Edition (161 pp., 5 figs; 2016) • ISBN 978-92-0-102815-0 • STI/PUB/1694 • €54.00

Predisposal Management of Radioactive Waste from Nuclear Power Plants and Research Reactors

Specific Safety Guide

IAEA Safety Standards Series No. SSG-40

This Safety Guide provides operating organizations that generate and manage radioactive waste as well as regulatory bodies and government bodies with recommendations on how to meet the requirements for the predisposal management of radioactive waste generated at nuclear power plants and research reactors (including subcritical and critical assemblies). It covers all stages in the lifetime of waste management facilities, including their siting, design, construction, commissioning, operation, and shutdown and decommissioning. It covers all steps carried out in the management of radioactive waste following its generation up to (but not including) disposal, including its processing (pre-treatment, treatment and conditioning). Radioactive waste generated during normal operation and in accident conditions is considered.

English Edition (83 pp., 4 figs; 2016) • ISBN 978-92-0-109815-3 • STI/PUB/1719 • €42.00

Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-47

Decommissioning is the last step in the lifetime management of an authorized facility and it must be considered during the design, construction, commissioning and operation of such facilities. This publication provides guidance on how to comply with requirements for the safe decommissioning of nuclear power plants, research reactors, and other nuclear fuel cycle facilities. It addresses all the aspects of decommissioning that are required to ensure safety including: roles and responsibilities, strategy and planning for decommissioning, conduct of decommissioning actions and completion of decommissioning. It is intended for use by those working in policy and strategy development, planning, implementation and regulatory control of decommissioning.

(Forthcoming) • ISBN 978-92-0-104118-0 • STI/PUB/1812 • €40.00

Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-48

This Safety Guide supplements and provides recommendations on meeting the requirements related to ageing management and long term operation that are established in IAEA Safety Standards Series No. SSR-2/1 (Rev.1), Safety of Nuclear Power Plants: Design, and IAEA Safety Standards Series No. SSR-2/2 (Rev.1), Safety of Nuclear Power Plants: Commissioning and Operation. It provides guidance for operating organizations on implementing and improving ageing management and, obsolescence management and on developing a programme for safe long term operation for nuclear power plants. It may also be used by the regulatory body in preparing regulatory requirements, codes and standards, and in verifying effective ageing management, obsolescence management and preparation for safe long term operation of nuclear power plants.

(Forthcoming) • ISBN 978-92-0-104318-4 • STI/PUB/1814 • €43.00

Operating Experience Feedback for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-50

A robust operating experience programme prevents or minimizes the risk of future events by learning from events that have already occurred. This Safety Guide provides recommendations for establishing, implementing, assessing and continuously improving an operating experience programme for nuclear installations. The publication is primarily aimed at operating organizations and regulatory bodies responsible for nuclear installation and describes their roles and responsibilities in the overall operating experience programme. However, this publication is also of relevance to other organizations involved in the design, construction, commissioning, operation and decommissioning of nuclear installations, including technical support organizations, vendor companies, research establishments and universities.

English Edition (45 pp., 2 figs; 2018) • ISBN 978-92-0-100918-0 • STI/PUB/1805 • €30.00

Site Evaluation for Nuclear Installations

Safety Requirements

IAEA Safety Standards Series No. NS-R-3 (Rev. 1)

Please see page 19

Safety of Research Reactors

Specific Safety Requirements

IAEA Safety Standards Series No. SSR-3

This Safety Requirements publication establishes requirements for all main areas of safety for research reactors, with particular emphasis on requirements for design and operation. It explains the safety objectives and concepts that form the basis for safety and safety assessment for all stages in the lifetime of a research reactor. Technical and administrative requirements for the safety of new research reactors are established in accordance with these objectives and concepts, and they are to be applied to the extent practicable for existing research reactors. The safety requirements established in this publication for the management of safety and regulatory supervision apply to site evaluation, design, manufacturing, construction, commissioning, operation (including utilization and modification), and planning for decommissioning of research reactors (including critical assemblies and subcritical assemblies). The publication is intended for use by regulatory bodies and other organizations with responsibilities in these areas and in safety analysis, verification and review, and the provision of technical support.

Arabic Edition (123 pp., 2 figs; 2018) • ISBN 978-92-0-609317-7 • STI/PUB/1751 • €58.00

Chinese Edition (113 pp., 2 figs; 2017) • ISBN 978-92-0-506017-0 • STI/PUB/1751 • €58.00

English Edition (125 pp., 2 figs; 2016) • ISBN 978-92-0-104816-5 • STI/PUB/1751 • €58.00

French Edition (135 pp., 2 figs; 2017) • ISBN 978-92-0-203617-8 • STI/PUB/1751 • €58.00

Russian Edition (153 pp., 2 figs; 2017) • ISBN 978-92-0-405017-2 • STI/PUB/1751 • €58.00

Spanish Edition (135 pp., 2 figs; 2017) • ISBN 978-92-0-305917-6 • STI/PUB/1751 • €58.00

The Management System for Nuclear Installations

Safety Guide

IAEA Safety Standards Series No. GS-G-3.5

Please see page 19

Evaluation of Seismic Safety for Existing Nuclear Installations

Safety Guide

IAEA Safety Standards Series No. NS-G-2.13

Please see page 27

Commissioning of Research Reactors

Safety Guide

IAEA Safety Standards Series No. NS-G-4.1

This Safety Guide provides recommendations for the commissioning of research reactors on the basis of international best practices. The guidance and recommendations of this Safety Guide are applicable to most types of research reactors and fulfil the general requirements on research reactor safety presented in IAEA Safety Standards Series No. NS-R-4, Safety of Research Reactors, as well as those in Safety Series No. 35-G1, Safety Assessment of Research Reactors and Preparation of the Safety Analysis Report. Commissioning is one of the major steps in the life cycle of a research reactor, and appropriate guidance for conducting the process is essential. The emphasis in this Safety Guide is on the commissioning of a new research reactor, but guidance is also provided on the commissioning of new experiments and of reactor modifications.

English Edition (65 pp.; 2006) • ISBN 92-0-109606-2 • STI/PUB/1268 • €28.00

Maintenance, Periodic Testing and Inspection of Research Reactors

Safety Guide

IAEA Safety Standards Series No. NS-G-4.2

This Safety Guide provides practical guidance on how to fulfil requirements on research reactor safety. It covers a broad range of international practices, including preventive and corrective maintenance of structures, systems and components, periodic testing to ensure that operations remain within established operating limits and conditions, and non-routine inspections. This Safety Guide is applicable to all types of heterogeneous research reactors having a power rating of up to several tens of megawatts.

English Edition (67 pp., 1 fig.; 2006) • ISBN 92-0-109806-5 • STI/PUB/1270 • €30.00

Core Management and Fuel Handling for Research Reactors

Safety Guide

IAEA Safety Standards Series No. NS-G-4.3

This Safety Guide provides practical guidance and recommendations to meet the requirements on research reactor safety. It addresses aspects of those core management activities that should be performed to allow optimum reactor core operation and reactor utilization for experiments without compromising the limits imposed by the design safety considerations relating to the fuel assemblies and the reactor as a whole. It also covers the management of in-core and out-of-core experimental devices. The incorporation of newly designed fuel assemblies into an existing core is also considered. The guidance on the handling of fuel and core components covers the aspects of receipt, storage and handling of fresh fuel assemblies and other core components; inspection of fresh fuel assemblies; loading and unloading of fuel assemblies and core components; inspection of irradiated fuel; insertion and removal of other reactor materials, either manually or by automated systems; and preparation of fuel assemblies for shipment and loading of a transport container with irradiated fuel.

English Edition (53 pp.; 2008) • ISBN 978-92-0-111307-8 • STI/PUB/1315 • €22.00

Operational Limits and Conditions and Operating Procedures for Research Reactors

Safety Guide

IAEA Safety Standards Series No. NS-G-4.4

This publication provides practical guidance on all important aspects of developing, formulating and presenting the operational limits and conditions as well as the operating procedures for research reactors. It covers the concept of operational limits and conditions, their content, and the responsibilities of the operating organization with respect to their establishment, modification, documentation and compliance. The guidance also covers the training of operating personnel on performing periodic testing, established by the operational limits and conditions and operating procedures.

English Edition (67 pp.; 2008) • ISBN 978-92-0-103508-0 • STI/PUB/1333 • €23.00

The Operating Organization and the Recruitment, Training and Qualification of Personnel for Research Reactors

Safety Guide

IAEA Safety Standards Series No. NS-G-4.5

This Safety Guide provides recommendations on meeting the requirements on the operating organization and on personnel for research reactors. It covers the typical operating organization for research reactor facilities; the recruitment process and qualification in terms of education, training and experience; programmes for initial and continuing training; the authorization process for those individuals having an immediate bearing on safety; and the processes for their requalification and reauthorization.

English Edition (89 pp., 2 figs; 2008) • ISBN 978-92-0-103708-4 • STI/PUB/1335 • €20.00

Radiation Protection and Radioactive Waste Management in the Design and Operation of Research Reactors

Safety Guide

IAEA Safety Standards Series No. NS-G-4.6

This Safety Guide provides guidance on radiation protection and radioactive waste management programmes for research reactor facilities. It identifies important components that should be considered at the design stage with regard to facilitating radiation protection and radioactive waste management. It also recommends good practices in implementing operational radiation protection and radioactive waste management programmes, and in their optimization.

English Edition (104 pp.; 2009) • ISBN 978-92-0-111608-6 • STI/PUB/1369 • €30.00

Seismic Hazards in Site Evaluation for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-9

Please see page 31

Ageing Management for Research Reactors

Specific Safety Guide

IAEA Safety Standards Series No. SSG-10

This Safety Guide provides practical guidance and recommendations on ageing management for the safety related systems, structures and components of research reactors on the basis of current international good practices. It is intended for use by operating organizations in establishing, implementing and improving ageing management programmes for research reactors, and by regulatory bodies in verifying that ageing of research reactors is being effectively managed. The Safety Guide focuses on managing the physical ageing of systems, structures and components important to safety, and also provides guidance on safety aspects of managing obsolescence.

English Edition (52 pp.; 2010) • ISBN 978-92-0-102810-5 • STI/PUB/1447 • €25.00

Licensing Process for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-12

Please see page 32

Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-18

Please see page 33

Safety Assessment for Research Reactors and Preparation of the Safety Analysis Report

Specific Safety Guide

IAEA Safety Standards Series No. SSG-20

This publication is a revision of IAEA Safety Series No. 35-G1, and experience acquired from the use of that Safety Guide has been taken into account. The present publication provides guidance on performing safety assessments throughout the lifetime of a research reactor and on the regulatory review of this assessment within the framework of the licensing process. Guidance on preparation of the safety analysis report, including its format and contents, is also provided.

English Edition (118 pp., 2 figs; 2012) • ISBN 978-92-0-115410-1 • STI/PUB/1508 • €35.00

Volcanic Hazards in Site Evaluation for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-21

Please see page 34

Use of a Graded Approach in the Application of the Safety Requirements for Research Reactors

Specific Safety Guide

IAEA Safety Standards Series No. SSG-22

This publication provides recommendations on the appropriate manner to comply with the Safety Requirements for research reactors, IAEA Safety Standards Series No. NS-R-4, utilizing a graded approach. It is intended for use by operating organizations, regulatory bodies and other organizations involved in the design, construction and operation of research reactors.

English Edition (74 pp., 2 figs; 2012) • ISBN 978-92-0-127310-9 • STI/PUB/1547 • €29.00

Safety in the Utilization and Modification of Research Reactors

Specific Safety Guide

IAEA Safety Standards Series No. SSG-24

This Safety Guide is a revision of IAEA Safety Series No. 35-G2 on safety in the utilization and modification of research reactors. It provides recommendations on meeting the requirements for the categorization, safety assessment and approval of research reactor experiments and modification projects. Specific safety considerations in different phases of utilization and modification projects are covered, including the pre-implementation, implementation and post-implementation phases. Guidance is also provided on the operational safety of experiments, including in the handling, dismantling, post-irradiation examination and disposal of experimental devices. Examples of the application of the safety categorization process for experiments and modification projects and of the content of the safety analysis report for an experiment are also provided.

English Edition (68 pp., 3 figs; 2012) • ISBN 978-92-0-129110-3 • STI/PUB/1559 • €28.00

Criticality Safety in the Handling of Fissile Material

Specific Safety Guide

IAEA Safety Standards Series No. SSG-27

Please see page 35

Site Survey and Site Selection for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-35

Please see page 36

Instrumentation and Control Systems and Software Important to Safety for Research Reactors

Specific Safety Guide

IAEA Safety Standards Series No. SSG-37

This Safety Guide provides recommendations and guidance on instrumentation and control systems and software important to safety for research reactors, including instrumentation and control system architecture and associated components, from sensors to actuators, operator interfaces and auxiliary equipment. It also provides recommendations on computer based systems and software, including software requirements and design, verification and validation, integration, and operation. This publication also addresses safety classification, design, implementation, qualification and operation of instrumentation as well as control systems. The recommendations and guidance apply to both the design and configuration management of instrumentation and control systems for new research reactors and the modernization of the instrumentation and control systems to existing research reactor facilities. In addition, this Safety Guide provides recommendations and guidance on human factors engineering and human-machine interfaces, and for computer based systems and software for use in instrumentation and control systems important to safety.

English Edition (75 pp., 6 figs; 2015) • ISBN 978-92-0-102615-6 • STI/PUB/1692 • €41.00

Construction for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-38

Please see page 37

Predisposal Management of Radioactive Waste from Nuclear Power Plants and Research Reactors

Specific Safety Guide

IAEA Safety Standards Series No. SSG-40

Please see page 38

Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-47

Please see page 38

Operating Experience Feedback for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-50

Please see page 39

Fuel Cycle Facilities

Site Evaluation for Nuclear Installations

Safety Requirements

IAEA Safety Standards Series No. NS-R-3 (Rev. 1)

Please see page 19

Safety of Nuclear Fuel Cycle Facilities

Specific Safety Requirements

IAEA Safety Standards Series No. SSR-4

This Safety Requirements publication establishes a basis for safety and for safety assessment at all stages in the lifetime of nuclear fuel cycle facilities. A broad scope of requirements

is established for site evaluation, design, construction, commissioning, operation and preparation for decommissioning that must be satisfied to ensure safety. These requirements apply to facilities for conversion, enrichment, nuclear fuel production, storage of fresh and spent fuels, reprocessing, preparation for disposal and associated research and development facilities.

English Edition (135 pp., 1 fig.; 2017) • ISBN 978-92-0-103917-0 • STI/PUB/1791 • €48.00

The Management System for Nuclear Installations

Safety Guide

IAEA Safety Standards Series No. GS-G-3.5

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Evaluation of Seismic Safety for Existing Nuclear Installations

Safety Guide

IAEA Safety Standards Series No. NS-G-2.13

Please see page 27

Safety of Conversion Facilities and Uranium Enrichment Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-5

This Safety Guide supplements the Safety Requirements publication on Safety of Fuel Cycle Facilities and addresses all the stages in the life cycle of conversion facilities (CFs) and enrichment facilities (EFs), with emphasis placed on design and operation. It describes the actions, conditions and procedures for meeting safety requirements and deals specifically with the handling, processing and storage of depleted, natural and low enriched uranium. The publication is intended to be of use to designers, operating organizations and regulators for ensuring the safety of conversion and enrichment facilities.

English Edition (82 pp., 2 figs; 2010) • ISBN 978-92-0-104809-7 • STI/PUB/1404 • €28.00

Safety of Uranium Fuel Fabrication Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-6

This Safety Guide supplements the Safety Requirements publication Safety of Fuel Cycle Facilities and addresses all

the stages in the life cycle of uranium fuel fabrication facilities, with emphasis being placed on design and operation. It describes the actions, conditions and procedures for meeting safety requirements and deals specifically with the handling, processing and storage of low enriched uranium that has a ^{235}U concentration of no more than 6%, derived from natural, highly enriched or reprocessed uranium. The publication is intended to be of use to designers, operating organizations and regulators to ensure the safety of uranium fuel fabrication facilities.

English Edition (62 pp., 2 figs; 2010) • ISBN 978-92-0-104609-3 • STI/PUB/1402 • €25.00

Safety of Uranium and Plutonium Mixed Oxide Fuel Fabrication Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-7

This Safety Guide supplements the Safety Requirements publication Safety of Fuel Cycle Facilities and addresses all the stages in the life cycle of MOX fuel fabrication facilities, with emphasis placed on design and operation. It describes the actions, conditions and procedures for meeting safety requirements and deals specifically with the handling, processing and storage of plutonium oxide, depleted, natural or reprocessed uranium oxide or mixed oxide manufactured from the above to be used as a feed material to form MOX fuel rods and assemblies for export and subsequent use in water reactors and fast breeder reactors. The publication is intended to be of use to designers, operating organizations and regulators to ensure the safety of MOX fuel fabrication facilities.

English Edition (70 pp., 2 figs; 2010) • ISBN 978-92-0-104709-0 • STI/PUB/1403 • €27.00

Seismic Hazards in Site Evaluation for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-9

Please see page 31

Licensing Process for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-12

Please see page 32

Storage of Spent Nuclear Fuel

Specific Safety Guide

IAEA Safety Standards Series No. SSG-15

This Safety Guide provides recommendations and guidance on the storage of spent nuclear fuel. It covers all types of storage facilities and all types of spent fuel from nuclear power plants and research reactors. It takes into consideration the longer storage periods that have become necessary owing to delays in the development of disposal facilities and the decrease in reprocessing activities. It also considers developments associated with nuclear fuel, such as higher enrichment, mixed oxide fuels and higher burnup. The Safety Guide is not intended to cover the storage of spent fuel if this is part of the operation of a nuclear power plant or spent fuel reprocessing facility. Guidance is provided on all stages in the lifetime of a spent fuel storage facility, from planning through siting and design to operation and decommissioning, and in particular retrieval of spent fuel.

English Edition (110 pp.; 2012) • ISBN 978-92-0-115110-0 • STI/PUB/1503 • €40.00

Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-18

Please see page 33

Volcanic Hazards in Site Evaluation for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-21

Please see page 34

Criticality Safety in the Handling of Fissile Material

Specific Safety Guide

IAEA Safety Standards Series No. SSG-27

Please see page 35

Site Survey and Site Selection for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-35

Please see page 36

Construction for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-38

Please see page 37

Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-41

This Safety Guide provides guidance on the predisposal management of all types of radioactive waste (including spent nuclear fuel declared as waste and high level waste) generated at nuclear fuel cycle facilities. These waste management facilities may be located within larger facilities or may be separate, dedicated waste management facilities (including centralized waste management facilities). The Safety Guide covers all stages in the lifetime of these facilities, including their siting, design, construction, commissioning, operation, and shutdown and decommissioning. It covers all steps carried out in the management of radioactive waste following its generation up to (but not including) disposal, including its processing (pretreatment, treatment and conditioning). Radioactive waste generated both during normal operation and in accident conditions is considered.

English Edition (93 pp., 3 figs; 2016) • ISBN 978-92-0-110315-4 • STI/PUB/1720 • €43.00

Safety of Nuclear Fuel Reprocessing Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-42

This publication provides guidance on meeting the requirements of IAEA Safety Standards Series No. NS-R-5 (Rev.1) relating to nuclear fuel reprocessing facilities. It covers the lifetime of these facilities, from site selection through to decommissioning, concentrating on the design and operational phases. It applies to facilities that reprocess spent fuel and other material from nuclear power plants that use metallic and oxide fuels, including

materials from mixed oxide fuel (MOX) and breeder reactors. It covers the safety issues relating to: the handling of spent fuel; mechanical treatment and the dissolution of spent fuel in acid; the separation of uranium and plutonium from fission products using solvents; the separation and purification of plutonium and uranium; and the production and storage of solutions and oxides to be used as feed material to form fresh uranium or mixed (UO₂/PuO₂) oxide fuel.

English Edition (119 pp., 6 figs; 2017) • ISBN 978-92-0-103016-0 • STI/PUB/1744 • €51.00

Safety of Nuclear Fuel Cycle Research and Development Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-43

This publication provides guidance on meeting the requirements of IAEA Safety Standards Series No. NS-R-5 (Rev.1) relating to research and development facilities in the nuclear fuel cycle. It covers the lifetime of these facilities from site selection through to decommissioning, concentrating on design and operation. It applies to laboratories, pilot workshops and experimental facilities that store, handle and process uranium, plutonium and other transuranics, fission products and activated materials in significant quantities. Such facilities may be involved in the study of chemical, metallurgical or radiological properties of specific radioactive materials such as prototype nuclear fuels (before and after reactor irradiation) or nuclear material or radioactive waste arising from experimental processes. This Safety Guide also applies to research and development for processes and equipment that are envisaged for later use on an industrial scale for the nuclear fuel cycle (e.g. pilot workshops for active waste conditioning).

English Edition (93 pp., 2 figs; 2017) • ISBN 978-92-0-103116-7 • STI/PUB/1745 • €44.00

Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-47

Please see page 38

Operating Experience Feedback for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-50

Please see page 39

Radioactive Waste Disposal Facilities

Disposal of Radioactive Waste

Specific Safety Requirements

IAEA Safety Standards Series No. SSR-5

This publication establishes requirements applicable to all types of radioactive waste disposal facility. It is linked to the fundamental safety principles for each disposal option and establishes a set of strategic requirements that must be in place before facilities are developed. Consideration is also given to the safety of existing facilities developed prior to the establishment of present day standards. The requirements will be complemented by Safety Guides that will provide guidance on good practice for meeting the requirements for different types of waste disposal facility.

Arabic Edition (70 pp.; 2011) • ISBN 978-92-0-619110-1 • STI/PUB/1449 • €48.00

Chinese Edition (56 pp.; 2011) • ISBN 978-92-0-519210-9 • STI/PUB/1449 • €48.00

English Edition (62 pp.; 2011) • ISBN 978-92-0-103010-8 • STI/PUB/1449 • €48.00

French Edition (66 pp.; 2011) • ISBN 978-92-0-220310-5 • STI/PUB/1449 • €48.00

Russian Edition (76 pp.; 2011) • ISBN 978-92-0-420010-2 • STI/PUB/1449 • €48.00

Spanish Edition (70 pp.; 2012) • ISBN 978-92-0-322010-1 • STI/PUB/1449 • €48.00

The Management System for the Disposal of Radioactive Waste

Safety Guide

IAEA Safety Standards Series No. GS-G-3.4

The objective of this Safety Guide is to provide guidance on the development and implementation of management systems for all phases of radioactive waste disposal facilities and related activities, with a description of how to apply the requirements detailed in The Management System for Facilities and Activities, IAEA Safety Standards Series No. GS-R-3, to the activities and facilities associated with waste disposal.

English Edition (75 pp.; 2008) • ISBN 978-92-0-102108-3 • STI/PUB/1330 • €25.00

Russian Edition (88 pp.; 2015) • ISBN 978-92-0-404115-6 • STI/PUB/1330 • €25.00

Borehole Disposal Facilities for Radioactive Waste

Safety Guide

IAEA Safety Standards Series No. SSG-1

This Safety Guide addresses the safety issues relevant to the disposal of disused sealed sources and provides guidance on meeting the safety requirements and criteria for such facilities. In addition to making recommendations on safety for borehole facilities, such as in site selection and characterization, design and operation, and for closure and post-closure, the Safety Guide also covers provision for containment and isolation, and the performance requirements of the engineered components of the disposal system.

English Edition (100 pp., 2 figs; 2009) • ISBN 978-92-0-109109-3 • STI/PUB/1418 • €32.00

Geological Disposal Facilities for Radioactive Waste

Specific Safety Guide

IAEA Safety Standards Series No. SSG-14

This Safety Guide provides guidance on prevailing good practices for meeting and demonstrating compliance with, the Safety Requirements on Disposal of Radioactive Waste in a systematic and comprehensive manner. It covers aspects related to siting, design, construction, operation and closure, including the safety case, its supporting safety assessments and the regulatory process. The publication addresses both operational and long term safety of geological disposal facilities for waste that pose a hazard for at least several thousand years.

English Edition (104 pp., 2 figs; 2011) • ISBN 978-92-0-111510-2 • STI/PUB/1483 • €32.00

The Safety Case and Safety Assessment for the Disposal of Radioactive Waste

Specific Safety Guide

IAEA Safety Standards Series No. SSG-23

This Safety Guide provides guidance and recommendations on meeting the safety requirements in respect of the safety case and supporting safety assessment for the disposal of radioactive waste. The safety case and supporting safety assessment provide the basis for demonstration of safety and for licensing of radioactive waste disposal facilities, and assist and guide decisions on siting, design and operations. The safety case is also the main basis on which dialogue with

interested parties is conducted and on which confidence in the safety of the disposal facility is developed. This Safety Guide is relevant for operating organizations preparing the safety case as well as for the regulatory body responsible for developing the regulations and regulatory guidance that determine the basis and scope of the safety case.

English Edition (120 pp., 5 figs; 2012) • ISBN 978-92-0-128310-8 • STI/PUB/1553 • €39.00

Near Surface Disposal Facilities for Radioactive Waste

Specific Safety Guide

IAEA Safety Standards Series No. SSG-29

This Safety Guide provides recommendations on how to meet safety requirements on the disposal of radioactive waste. It is concerned with the disposal of solid radioactive waste by emplacement in designated facilities at or near the land surface. The Safety Guide provides guidance on the development, operation and closure of, and on the regulatory control of, near surface disposal facilities, which are suitable for the disposal of very low level waste and low level waste. The Safety Guide provides guidance on a range of disposal methods, including the emplacement of solid radioactive waste in earthen trenches, in above ground engineered structures, in engineered structures just below the ground surface and in rock caverns, silos and tunnels excavated at depths of up to a few tens of metres underground. It is intended for use primarily by those involved with policy development for, with the regulatory control of, and with the development and operation of near surface disposal facilities.

English Edition (103 pp., 5 figs; 2014) • ISBN 978-92-0-114313-6 • STI/PUB/1637 • €36.00

Monitoring and Surveillance of Radioactive Waste Disposal Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-31

This Safety Guide provides recommendations and guidance on how to plan and perform monitoring and surveillance programmes for disposal facilities for radioactive waste. The Safety Guide considers monitoring and surveillance for near surface disposal facilities, for geological disposal facilities and for facilities for the disposal of waste from mining and from mineral processing. The publication provides recommendations on how to use results from the monitoring and surveillance of radioactive waste disposal facilities over their entire lifetime. It

covers the different objectives of monitoring and surveillance for the different periods of the lifetime of disposal facilities, from the initiation of work on a candidate site to the period after closure of the disposal facility.

English Edition (73 pp., 3 figs; 2014) • ISBN 978-92-0-115513-9 • STI/PUB/1640 • €40.00

Mining and Processing

Management of Radioactive Waste from the Mining and Milling of Ores

Safety Guide

IAEA Safety Standards Series No. WS-G-1.2

This Safety Guide provides recommendations and guidance on the safe management of radioactive waste resulting from the mining and milling of ores, with the purpose of protecting workers, the public and the environment from the consequences of these activities. It supplements Safety Standards Series No. WS-R-1, Near Surface Disposal of Radioactive Waste.

English Edition (39 pp., 2 figs; 2002) • ISBN 92-0-115802-5 • STI/PUB/1134 • €13.50

Russian Edition (47 pp., 2 figs; 2005) • ISBN 92-0-404104-8 • STI/PUB/1134 • €13.50

Spanish Edition (41 pp., 2 figs; 2010) • ISBN 978-92-0-301510-3 • STI/PUB/1134 • €13.50

Application of Radiation Sources

Categorization of Radioactive Sources

Safety Guide

IAEA Safety Standards Series No. RS-G-1.9

Please see page 15

Safety of Radiation Generators and Sealed Radioactive Sources

Safety Guide

IAEA Safety Standards Series No. RS-G-1.10

The objective of this Safety Guide is to assist Member States in implementing regulatory requirements for radiation sources that will ensure their safety. To that end, this publication provides guidance on infrastructure responsibilities for safety, on methodologies for performing safety assessments and on specific design and operational measures that should be taken to ensure safety throughout the life cycle of radiation generators and sealed radioactive sources. The safety measures recommended are also applicable to radioactive sources in nuclear facilities or radioactive waste disposal facilities, while

recognizing that these facilities should in any case provide a high standard of source safety.

English Edition (59 pp., 5 figs; 2006) • ISBN 92-0-107506-5 • STI/PUB/1258 • €25.00

French Edition (63 pp., 5 figs; 2008) • ISBN 978-92-0-212208-6 • STI/PUB/1258 • €25.00

Spanish Edition (63 pp., 5 figs; 2009) • ISBN 978-92-0-307409-4 • STI/PUB/1258 • €25.00

Decommissioning of Medical, Industrial and Research Facilities

Safety Guide

IAEA Safety Standards Series No. WS-G-2.2

This Safety Guide addresses the subject of how to meet the requirements for the decommissioning of medical, industrial and research facilities where radioactive materials and sources are produced, received, used and stored. It provides guidance to national authorities and operating organizations, particularly to those in developing countries (as such facilities are predominant in these countries), on the planning and safe management of the decommissioning of such facilities.

Arabic Edition (32 pp., 2 figs; 1999) • STI/PUB/1078 • €13.00

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Radiation Safety of Gamma, Electron and X Ray Irradiation Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-8

This Safety Guide provides recommendations on how to meet the requirements of the IAEA International Basic Safety Standards with regard to irradiation facilities. It gives practical information on the safe design and operation of gamma, electron and X ray irradiators in accordance with these requirements, and discusses the beneficial applications of ionizing irradiation and how to avoid potential radiation hazards at industrial irradiators, including contamination arising from damaged radioactive sources. The Safety Guide is intended for use by the designers and operating organizations of these facilities and also by regulatory bodies.

English Edition (94 pp., 8 figs; 2010) • ISBN 978-92-0-103710-7 • STI/PUB/1454 • €30.00

Spanish Edition (98 pp., 8 figs; 2015) • ISBN 978-92-0-304314-4 • STI/PUB/1454 • €30.00

Radiation Safety in Industrial Radiography

Specific Safety Guide

IAEA Safety Standards Series No. SSG-11

This Safety Guide provides recommendations for ensuring radiation safety in industrial radiography used in non-destructive testing. This includes industrial radiography work that utilizes X ray and gamma sources, both in shielded facilities that have effective engineering controls and outside shielded facilities using mobile sources.

Arabic Edition (105 pp., 2 figs; 2012) • ISBN 978-92-0-633110-1 • STI/PUB/1466 • €33.00

English Edition (104 pp., 2 figs; 2011) • ISBN 978-92-0-107210-8 • STI/PUB/1466 • €33.00

French Edition (112 pp., 2 figs; 2013) • ISBN 978-92-0-236610-7 • STI/PUB/1466 • €33.00

Spanish Edition (112 pp., 2 figs; 2014) • ISBN 978-92-0-338710-1 • STI/PUB/1466 • €33.00

Control of Orphan Sources and Other Radioactive Material in the Metal Recycling and Production Industries

Specific Safety Guide

IAEA Safety Standards Series No. SSG-17

Accidents involving orphan sources and other radioactive material in the metal recycling and production industries have resulted in serious radiological accidents as well as in harmful environmental, social and economic impacts. This Safety Guide provides recommendations, the implementation of which should prevent such accidents and provide confidence that scrap metal and recycled products are safe.

Arabic Edition (97 pp., 4 figs; 2014) • ISBN 978-92-0-606914-1 • STI/PUB/1509 • €31.00

English Edition (82 pp., 4 figs; 2012) • ISBN 978-92-0-115510-8 • STI/PUB/1509 • €31.00

French Edition (88 pp., 4 figs; 2014) • ISBN 978-92-0-209114-6 • STI/PUB/1509 • €31.00

Spanish Edition (90 pp., 4 figs; 2013) • ISBN 978-92-0-344010-3 • STI/PUB/1509 • €31.00

National Strategy for Regaining Control over Orphan Sources and Improving Control over Vulnerable Sources

Specific Safety Guide

IAEA Safety Standards Series No. SSG-19

This Safety Guide is intended to provide recommendations on the establishment of a national strategy for regaining control over orphan radioactive sources and for improving control over vulnerable radioactive sources. It provides guidance on how to assess the national situation, and develop and implement a national strategy to achieve these goals.

Arabic Edition (92 pp., 4 figs; 2012) • ISBN 978-92-0-636210-5 • STI/PUB/1510 • €35.00

English Edition (100 pp., 4 figs; 2011) • ISBN 978-92-0-115610-5 • STI/PUB/1510 • €35.00

French Edition (104 pp., 4 figs; 2015) • ISBN 978-92-0-210314-6 • STI/PUB/1510 • €35.00

Spanish Edition (102 pp., 4 figs; 2013) • ISBN 978-92-0-337110-0 • STI/PUB/1510 • €35.00

Protection of the Public against Exposure Indoors due to Radon and Other Natural Sources of Radiation

Specific Safety Guide

IAEA Safety Standards Series No. SSG-32

This Safety Guide provides recommendations on meeting the requirements established in the IAEA International Basic Safety Standards, for protection of the public against exposure indoors due to natural sources of radiation. Guidance is provided on the application of the requirements for justification and optimization of protection by national authorities in considering control of natural sources of radiation indoors such as radon and radionuclides of natural origin in materials used for the construction of dwellings, offices, industrial premises and other buildings. The Safety Guide provides recommendations and guidance to be followed by the regulatory body and by other authorities and organizations with responsibilities in relation to exposure to radiation from natural sources.

English Edition (90 pp., 4 figs; 2015) • ISBN 978-92-0-102514-2 • STI/PUB/1651 • €45.00

Radiation Safety for Consumer Products

Specific Safety Guide

IAEA Safety Standards Series No. SSG-36

In the IAEA safety standards, a 'consumer product' is defined as a device or manufactured item into which radionuclides have deliberately been incorporated or produced by activation,

or which generates ionizing radiation, and which can be sold or made available to members of the public without special surveillance or regulatory control after sale. Many such products, including irradiated gemstones, are sold in commercial outlets and over the Internet. This Safety Guide outlines the regulatory approach to authorizing the manufacture and supply of such products to the public, including justification, safety assessment and application of the criteria for exemption. The guidance will also assist manufacturers, transport companies and suppliers to comply with regulatory requirements during the life cycle of consumer products, including recycling and disposal at the end of their useful life.

English Edition (109 pp., 3 figs; 2016) • ISBN 978-92-0-102515-9 • STI/PUB/1691 • €52.00

Establishing the Infrastructure for Radiation Safety

Specific Safety Guide

IAEA Safety Standards Series No. SSG-44

The objective of this Safety Guide is to provide guidance on the establishment of the national radiation safety infrastructure that meets the IAEA safety standards. It provides recommendations, in the form of actions, on meeting the relevant Safety Requirements in an effective and integrated manner while taking specific national circumstances into full consideration. This Safety Guide does not diminish the application of, or provide a synopsis of or a substitute for, the IAEA Safety Fundamentals and Safety Requirements publications or other associated Safety Guides. Rather it sets out a holistic approach to the establishment of the national radiation safety infrastructure and provides advice for the application of IAEA safety standards for both, States having essentially no elements of the radiation safety infrastructure in place, and those that already have some.

English Edition (85 pp., 2 figs; 2018) • ISBN 978-92-0-101517-4 • STI/PUB/1773 • €42.00

Predisposal Management of Radioactive Waste from the Use of Radioactive Material in Medicine, Industry, Agriculture, Research and Education

Specific Safety Guide

IAEA Safety Standards Series No. SSG-45

This Safety Guide is applicable to the predisposal management of radioactive waste derived from the use of radioactive materials in medicine, industry, agriculture, research and education, including disused sealed radioactive sources. It focuses on waste generated at facilities such as hospitals and research

centres, where radioactive waste is not usually generated in bulk quantities. It covers the managerial, administrative and technical issues associated with the safe management of radioactive waste, from its generation to its acceptance at a disposal facility or its release from regulatory control.

(Forthcoming) • ISBN 978-92-0-111316-0 • STI/PUB/1758 • €40.00

Radiation Protection and Safety in Medical Uses of Ionizing Radiation

Specific Safety Guide

IAEA Safety Standards Series No. SSG-46

This Safety Guide provides recommendations and guidance on fulfilling the requirements of IAEA Safety Standards Series No. GSR Part 3 for ensuring radiation protection and safety of radiation sources in medical uses of ionizing radiation with regard to patients, workers, carers and comforters, volunteers in biomedical research, and the public. It covers radiological procedures in diagnostic radiology (including dentistry), image guided interventional procedures, nuclear medicine, and radiotherapy. Recommendations and guidance are provided on applying a systematic approach to ensure that there is a balance between being able to utilize the benefits from medical uses of ionizing radiation and minimizing the risk of radiation effects to people.

(Forthcoming) • ISBN 978-92-0-101717-8 • STI/PUB/1775 • €54.00

Transport of Radioactive Material

Regulations for the Safe Transport of Radioactive Material (2018 Edition)

Specific Safety Requirements

IAEA Safety Standards Series No. SSR-6 (Rev.1)

The transport of radioactive material is an essential activity worldwide. Both safety and security during transport are matters of national and international importance. This publication is the latest edition of the IAEA Safety Requirements for the safe transport of radioactive material. It is supported by six IAEA Safety Guides which provide explanation and guidance for the SSR-6 requirements to facilitate harmonized implementation. The SSR-6 Regulations apply to the transport of radioactive material by all modes on land, water, or in the air, including transport that is incidental to the use of the radioactive material. Transport comprises all operations and conditions associated with, and involved in, the movement of radioactive material;

these include the design, manufacture, maintenance and repair of packaging, and the preparation, consigning, loading, carriage including in-transit storage, unloading and receipt at the final destination of loads of radioactive material and packages. These requirements form an integral part of regulations worldwide, therefore SSR-6 and its associated guidance documents are a requisite source of guidance information for governments, regulators, and all individuals involved in the aforementioned activities of transport of radioactive material.

English Edition (165 pp., 7 figs; 2018) • ISBN 978-92-0-107917-6 • STI/PUB/1798 • €49.00

Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition)

Specific Safety Guide

IAEA Safety Standards Series No. SSG-26

This Safety Guide provides recommendations and guidance on achieving and demonstrating compliance with IAEA Safety Standards Series No. SSR-6, Regulations for the Safe Transport of Radioactive Material (2012 Edition), which establishes the requirements to be applied to the national and international transport of radioactive material. Transport is deemed to comprise all operations and conditions associated with and involved in the movement of radioactive material, including the design, fabrication and maintenance of packaging, and the preparation, consigning, handling, carriage, storage in transit and receipt at the final destination of packages. This publication supersedes IAEA Safety Standards Series No. TS-G-1.1 (Rev. 1), which was issued in 2008.

English Edition (450 pp., 17 figs; 2014) • ISBN 978-92-0-136910-9 • STI/PUB/1586 • €70.00

Spanish Edition (506 pp., 17 figs; 2016) • ISBN 978-92-0-300116-8 • STI/PUB/1586 • €70.00

Criticality Safety in the Handling of Fissile Material

Specific Safety Guide

IAEA Safety Standards Series No. SSG-27

Please see page 35

Schedules of Provisions of the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition)

Specific Safety Guide

IAEA Safety Standards Series No. SSG-33

This Safety Guide aims to aid users of radioactive material and regulators by providing a listing of relevant requirements of the regulations (IAEA Safety Standards Series No. SSR-6) as applicable to the type of radioactive material, package or shipment. Once a consignor has properly classified the radioactive material to be shipped (following the recommendations provided in Section 2 and Fig. 1 of this Safety Guide), the appropriate UN number can be assigned and the paragraph numbers of specific requirements for shipment can be found in the corresponding schedule.

English Edition (289 pp., 4 figs; 2015) • ISBN 978-92-0-104214-9 • STI/PUB/1666 • €61.00

Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material

Safety Guide

IAEA Safety Standards Series No. TS-G-1.2 (ST-3)

This Safety Guide provides guidance on various aspects of emergency planning and preparedness for dealing effectively and safely with transport accidents involving radioactive material, including the assignment of responsibilities. It reflects the requirements specified in Safety Standards Series No. TS-R-1, Regulations for the Safe Transport of Radioactive Material, and those of Safety Series No. 115, International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources.

English Edition (125 pp., 7 figs; 2002) • ISBN 92-0-111602-0 • STI/PUB/1119 • €14.50

Russian Edition (149 pp., 7 figs; 2005) • ISBN 92-0-406105-7 • STI/PUB/1119 • €14.50

Spanish Edition (141 pp., 7 figs; 2009) • ISBN 978-92-0-307609-8 • STI/PUB/1119 • €14.50

Radiation Protection Programmes for the Transport of Radioactive Material

Safety Guide

IAEA Safety Standards Series No. TS-G-1.3

This Safety Guide provides guidance on meeting requirements for the establishment of radiation protection programmes (RPPs) for the transport of radioactive material. It is intended to

optimize radiation protection to comply with the requirements for radiation protection that underlie the Regulations for the Safe Transport of Radioactive Material. This Safety Guide covers general aspects of meeting the requirements for radiation protection, but does not cover criticality safety or other possible hazardous properties of radioactive material. The annexes of this Safety Guide include examples of RPPs, relevant excerpts from the transport regulations, examples of total dose per transport index handled, a checklist for road transport, specific segregation distances and emergency instructions for vehicle operators.

English Edition (93 pp.; 2007) • ISBN 92-0-109706-9 • STI/PUB/1269 • €32.00

Spanish Edition (101 pp.; 2011) • ISBN 978-92-0-312310-5 • STI/PUB/1269 • €32.00

The Management System for the Safe Transport of Radioactive Material

Safety Guide

IAEA Safety Standards Series No. TS-G-1.4

The purpose of this Safety Guide is to provide information to organizations that are developing, implementing or assessing a management system for activities relating to the transport of radioactive material. Such activities include, but are not limited to, design, fabrication, inspection and testing, maintenance, transport and disposal of radioactive material packaging. This publication is intended to assist those establishing or improving a management system to integrate safety, health, environmental, security, quality and economic elements to ensure that safety is properly taken into account in all activities of the organization.

English Edition (99 pp., 2 figs; 2008) • ISBN 978-92-0-108508-5 • STI/PUB/1352 • €32.00

Russian Edition (116 pp., 2 figs; 2015) • ISBN 978-92-0-404015-9 • STI/PUB/1352 • €32.00

Spanish Edition (107 pp., 2 figs; 2018) • ISBN 978-92-0-300916-4 • STI/PUB/1352 • €32.00

Compliance Assurance for the Safe Transport of Radioactive Material

Safety Guide

IAEA Safety Standards Series No. TS-G-1.5

This Safety Guide is intended to assist competent authorities in the development of compliance assurance programmes concerning the transport of radioactive material. It also provides guidance to applicants, licensees and operating organizations for their interactions with regulatory authorities.

English Edition (124 pp., 1 fig.; 2009) • ISBN 978-92-0-110208-9 • STI/PUB/1361 • €20.00

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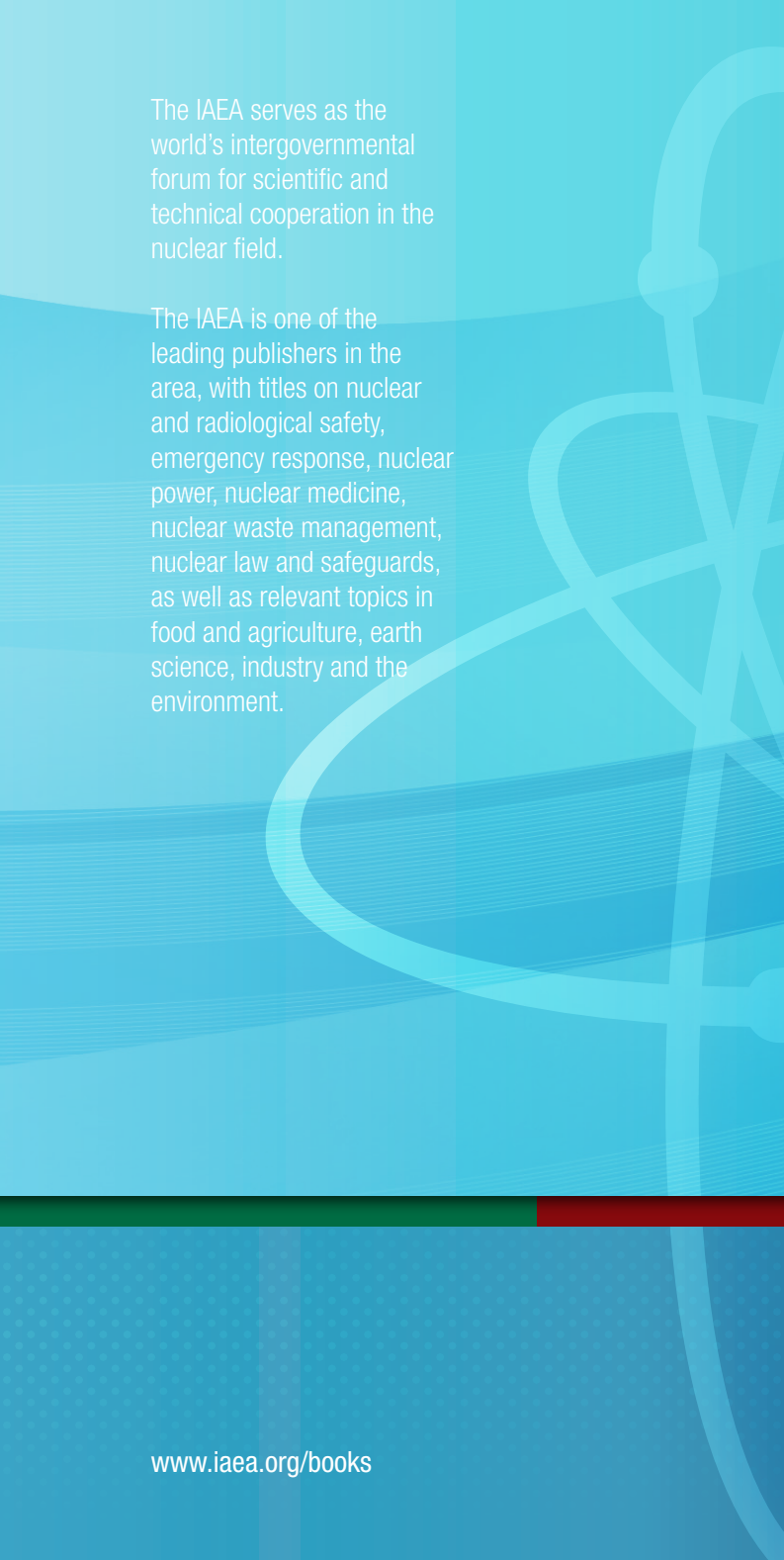
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