IAEA SAFETY STANDARDS SERIES

Application of the Concepts of Exclusion, Exemption and Clearance

SAFETY GUIDE

No. RS-G-1.7

IAEA
International Atomic Energy Agency

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

IAEA SAFETY RELATED PUBLICATIONS

IAEA SAFETY STANDARDS

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

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

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

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

Safety Guides (green lettering) recommend actions, conditions or procedures for meeting safety requirements. Recommendations in Safety Guides are expressed as 'should' statements, with the implication that it is necessary to take the measures recommended or equivalent alternative measures to comply with the requirements.

The IAEA's safety standards are not legally binding on Member States but may be adopted by them, at their own discretion, for use in national regulations in respect of their own activities. The standards are binding on the IAEA in relation to its own operations and on States in relation to operations assisted by the IAEA.

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

www-ns.iaea.org/standards/

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

OTHER SAFETY RELATED PUBLICATIONS

Under the terms of Articles III and VIII.C of its Statute, the IAEA makes available and fosters the exchange of information relating to peaceful nuclear activities and serves as an intermediary among its Member States for this purpose.

Reports on safety and protection in nuclear activities are issued in other series, in particular the **IAEA Safety Reports Series**, as informational publications. Safety Reports may describe good practices and give practical examples and detailed methods that can be used to meet safety requirements. They do not establish requirements or make recommendations.

Other IAEA series that include safety related publications are the **Technical Reports Series,** the **Radiological Assessment Reports Series,** the **INSAG Series, the TECDOC Series**, the **Provisional Safety Standards Series**, the **Training Course Series,** the **IAEA Services Series** and the **Computer Manual Series**, and **Practical Radiation Safety Manuals** and **Practical Radiation Technical Manuals**. The IAEA also issues reports on radiological accidents and other special publications.

AVA Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

APPLICATION OF THE CONCEPTS OF EXCLUSION, EXEMPTION AND CLEARANCE

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

The following States are Members of the International Atomic Energy Agency:

AFGHANISTAN
ALBANIA
ALGERIA
ANGOLA
ARGENTINA
ARMENIA
AUSTRALIA
AUSTRIA
AZERBAIJAN
BANGLADESH
BELARUS
BELGIUM
BENIN
BOLIVIA
BOSNIA AND HERZEGOVINA
BOTSWANA
BRAZIL
BULGARIA
BURKINA FASO
CAMEROON
CANADA
CENTRAL AFRICAN REPUBLIC
CHILE
CHINA
COLOMBIA
COSTA RICA
CÔTE D'IVOIRE
CROATIA
CUBA
CYPRUS
CZECH REPUBLIC
DEMOCRATIC REPUBLIC OF THE CONGO
DENMARK
DOMINICAN REPUBLIC
ECUADOR
EGYPT
EL SALVADOR
ERITREA
ESTONIA
ETHIOPIA
FINLAND
FRANCE
GABON
GEORGIA
GERMANY
GHANA
GREECE
GUATEMALA
HAITI
HOLY SEE
HONDURAS
HUNGARY
ICELAND
INDIA
INDONESIA
IRAN, ISLAMIC REPUBLIC OF
IRAQ
IRELAND
ISRAEL
ITALY
JAMAICA
JAPAN
JORDAN
KAZAKHSTAN
KENYA
KOREA, REPUBLIC OF
KUWAIT
KYRGYZSTAN
LATVIA
LEBANON
LIBERIA
LIBYAN ARAB JAMAHIRIYA
LIECHTENSTEIN
LITHUANIA
LUXEMBOURG
MADAGASCAR
MALAYSIA
MALI
MALTA
MARSHALL ISLANDS
MAURITIUS
MEXICO
MONACO
MONGOLIA
MOROCCO
MYANMAR
NAMIBIA
NETHERLANDS
NEW ZEALAND
NICARAGUA
NIGER
NIGERIA
NORWAY
PAKISTAN
PANAMA
PARAGUAY
PERU
PHILIPPINES
POLAND
PORTUGAL
QATAR
REPUBLIC OF MOLDOVA
ROMANIA
RUSSIAN FEDERATION
SAUDI ARABIA
SENEGAL
SERBIA AND MONTENEGRO
SEYCHELLES
SIERRA LEONE
SINGAPORE
SLOVAKIA
SLOVENIA
SOUTH AFRICA
SPAIN
SRI LANKA
SUDAN
SWEDEN
SWITZERLAND
SYRIAN ARAB REPUBLIC
TAJIKISTAN
THAILAND
THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA
TUNISIA
TURKEY
UGANDA
UKRAINE
UNITED ARAB EMIRATES
UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND
UNITED REPUBLIC OF TANZANIA
UNITED STATES OF AMERICA
URUGUAY
UZBEKISTAN
VENEZUELA
VIETNAM
YEMEN
ZAMBIA
ZIMBABWE

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

© IAEA, 2004

Permission to reproduce or translate the information contained in this publication may be obtained by writing to the International Atomic Energy Agency, Wagramer Strasse 5, P.O. Box 100, A-1400 Vienna, Austria.

Printed by the IAEA in Austria
August 2004
STI/PUB/1202

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

SAFETY STANDARDS SERIES No. RS-G-1.7

APPLICATION OF THE CONCEPTS OF EXCLUSION, EXEMPTION AND CLEARANCE

SAFETY GUIDE

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2004

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

IAEA Library Cataloguing in Publication Data

Application of the concepts of exclusion, exemption
and clearance : safety guide. — Vienna : International
Atomic Energy Agency, 2004.
p. : 24 cm. — (Safety standards series, ISSN 1020- 525X ;
no. RS-G-1.7)
STI/PUB/1202
ISBN 92-0-109404-3
Includes bibliographical references

1. Radioisotopes. 2. Radioactivity — Safety measures.
I. International Atomic Energy Agency. II. Series.

IAEAL 04-00372

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

FOREWORD

by Mohamed ElBaradei
Director General

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

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

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

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

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

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

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

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

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

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

EDITORIAL NOTE

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

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

The English version of the text is the authoritative version.

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

PREFACE

In September 2000, the General Conference of the IAEA requested the Secretariat to develop radiological criteria for long lived radionuclides in commodities, particularly foodstuffs and wood (Resolution GC(44)/RES/15). The Secretariat was requested to accomplish the task by using the IAEA's radiation protection advisory mechanisms and in collaboration with the competent organs of the United Nations and the specialized agencies concerned.

The present Safety Guide has been prepared in partial fulfilment of that request, and the guidance it provides can be applied to all commodities other than foodstuffs and drinking water. In order to comply with the request relating to foodstuffs, the Codex Alimentarius Commission of the Food and Agriculture Organization of the United Nations and the World Health Organization has been requested to review its radiological criteria for foodstuffs.

The general request contained in the resolution has been addressed by reviewing and expanding on the concepts of exclusion, exemption and clearance as discussed in the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS; IAEA Safety Series No. 115). The guidance provided in this Safety Guide is fully consistent with the concepts of the BSS and, when the BSS are revised as part of the review and revision process for safety standards, this guidance is expected to be considered for inclusion in the revised BSS.

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

CONTENTS

1. INTRODUCTION 1

Background (1.1–1.5) 1
Objective (1.6) 3
Scope (1.7–1.9) 3
Structure (1.10) 4

2. THE CONCEPTS 4

General (2.1–2.2) 4
Exclusion (2.3–2.5) 5
Exemption (2.6–2.11) 5
Clearance (2.12–2.14) 7

3. BASIS FOR THE DERIVATION OF ACTIVITY CONCENTRATION VALUES 7

General (3.1) 7
Exclusion (3.2–3.3) 8
Exemption and clearance (3.4–3.7) 9

4. VALUES OF ACTIVITY CONCENTRATION 10

General (4.1) 10
Radionuclides of natural origin (4.2–4.3) 10
Radionuclides of artificial origin (4.4–4.5) 11
Mixtures of radionuclides (4.6–4.8) 11

5. APPLICATION OF THE VALUES 16

Radionuclides of natural origin (5.1–5.4) 16
Radionuclides of artificial origin (5.5–5.7) 16
Trade (5.8–5.10) 17
Graded approach (5.11–5.13) 18
Verification of the values (5.14–5.18) 19
Dilution (5.19) 20

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

REFERENCES 21
CONTRIBUTORS TO DRAFTING AND REVIEW 23
BODIES FOR THE ENDORSEMENT OF SAFETY STANDARDS . 27

Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004

1. INTRODUCTION

BACKGROUND

1.1. The International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (the BSS) [1] specify requirements for the protection of health against exposure to ionizing radiation (hereinafter termed radiation) and for the safety of radiation sources. The BSS, which are based on information on the detrimental effects attributed to radiation exposure provided by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) [2] as well as on the recommendations of the International Commission on Radiological Protection (ICRP) [3], are intended to provide the basis for the regulation of both 'practices'[1] and 'interventions'[2]. The presence of national infrastructures for radiation protection is presumed in the BSS. A Safety Requirements publication [4] establishes the requirements for the legal and governmental infrastructure that is necessary to implement the BSS effectively. An essential element of this legal and governmental infrastructure is a national regulatory body that has the authority to establish or adopt regulations (Ref. [4], para. 2.2). Furthermore, "In order to discharge its main responsibilities, the regulatory body shall establish a process for dealing with applications, such as applications for the issuing of an authorization, accepting a notification or the granting of an exemption, or for removal from regulatory control" (Ref. [4], para. 3.3). The BSS [1] establish mechanisms for exclusion, exemption and clearance.

1.2. Humans incur radiation doses from exposure to radionuclides, which can either cause direct irradiation from outside the body or be taken into the body and irradiate it from within. Some radionuclides are primordial and some are created by the continuous interaction of cosmic rays with the atmosphere. Both

[1] A practice is any human activity that introduces additional sources of exposure or exposure pathways or extends exposure to additional people or modifies the network of exposure pathways from existing sources, so as to increase the exposure or the likelihood of exposure of people or the number of people exposed.

[2] An intervention is any action intended to reduce or avert exposure or the likelihood of exposure to sources which are not part of a controlled practice or which are out of control as a consequence of an accident.

AVA Documents
Document Sharing Hub

Full document details: IAEA RS-G-1.7 2004