

IAEA Safety Standards

for protecting people and the environment

Fundamental Safety Principles

Jointly sponsored by

Euratom FAO IAEA ILO IMO OECD/NEA PAHO UNEP WHO



IAEA

WHO

Safety Fundamentals

No. SF-1



IAEA

International Atomic Energy Agency

Copyright International Atomic Energy Agency
Provided by IHS Markit under license with IAEA
No reproduction or networking permitted without license from IHS
Full document details: IAEA SF-1 2006

Licensee=/, User=,
Not for Resale,



Documents

Document Sharing Hub

IAEA SAFETY RELATED PUBLICATIONS

IAEA SAFETY STANDARDS

Under the terms of Article III of its Statute, the IAEA is authorized to establish or adopt standards of safety for protection of health and minimization of danger to life and property, and to provide for the application of these standards.

The publications by means of which the IAEA establishes standards are issued in the **IAEA Safety Standards Series**. This series covers nuclear safety, radiation safety, transport safety and waste safety, and also general safety (i.e. all these areas of safety). The publication categories in the series are **Safety Fundamentals**, **Safety Requirements** and **Safety Guides**.

Safety standards are coded according to their coverage: nuclear safety (NS), radiation safety (RS), transport safety (TS), waste safety (WS) and general safety (GS).

Information on the IAEA's safety standards programme is available at the IAEA Internet site

<http://www-ns.iaea.org/standards/>

The site provides the texts in English of published and draft safety standards. The texts of safety standards issued in Arabic, Chinese, French, Russian and Spanish, the IAEA Safety Glossary and a status report for safety standards under development are also available. For further information, please contact the IAEA at P.O. Box 100, A-1400 Vienna, Austria.

All users of IAEA safety standards are invited to inform the IAEA of experience in their use (e.g. as a basis for national regulations, for safety reviews and for training courses) for the purpose of ensuring that they continue to meet users' needs. Information may be provided via the IAEA Internet site or by post, as above, or by email to Official.Mail@iaea.org.

OTHER SAFETY RELATED PUBLICATIONS

The IAEA provides for the application of the standards and, under the terms of Articles III and VIII.C of its Statute, 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 as **Safety Reports**, which provide practical examples and detailed methods that can be used in support of the safety standards.

Other safety related IAEA publications are issued as **Radiological Assessment Reports**, the International Nuclear Safety Group's **INSAG Reports**, **Technical Reports** and **TECDOCs**. The IAEA also issues reports on radiological accidents, training manuals and practical manuals, and other special safety related publications. Security related publications are issued in the **IAEA Nuclear Security Series**.

FUNDAMENTAL SAFETY PRINCIPLES

Safety standards survey

The IAEA welcomes your response. Please see:
<http://www-ns.iaea.org/standards/feedback.htm>

IAEA SAFETY STANDARDS SERIES No. SF-1

FUNDAMENTAL SAFETY PRINCIPLES

SAFETY FUNDAMENTALS

JOINTLY SPONSORED BY:
EUROPEAN ATOMIC ENERGY COMMUNITY,
FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS,
INTERNATIONAL ATOMIC ENERGY AGENCY,
INTERNATIONAL LABOUR ORGANIZATION,
INTERNATIONAL MARITIME ORGANIZATION,
OECD NUCLEAR ENERGY AGENCY,
PAN AMERICAN HEALTH ORGANIZATION,
UNITED NATIONS ENVIRONMENT PROGRAMME,
WORLD HEALTH ORGANIZATION

INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2006

COPYRIGHT NOTICE

All IAEA scientific and technical publications are protected by the terms of the Universal Copyright Convention as adopted in 1952 (Berne) and as revised in 1972 (Paris). The copyright has since been extended by the World Intellectual Property Organization (Geneva) to include electronic and virtual intellectual property. Permission to use whole or parts of texts contained in IAEA publications in printed or electronic form must be obtained and is usually subject to royalty agreements. Proposals for non-commercial reproductions and translations are welcomed and considered on a case-by-case basis. Enquiries should be addressed to the IAEA Publishing Section at:

Sales and Promotion, Publishing Section
International Atomic Energy Agency
Wagramer Strasse 5
P.O. Box 100
1400 Vienna, Austria
fax: +43 1 2600 29302
tel.: +43 1 2600 22417
email: sales.publications@iaea.org
<http://www.iaea.org/books>

© IAEA, 2006

Printed by the IAEA in Austria
November 2006
STI/PUB/1273

IAEA Library Cataloguing in Publication Data

Fundamental safety principles : safety fundamentals. – Vienna : International Atomic Energy Agency, 2006.

p. ; 24 cm. – (IAEA safety standards series, ISSN 1020-525X ; No. SF-1)

STI/PUB/1273

ISBN 92-0-110706-4

1. Radiation — Safety measures. 2. Emergency management.
3. Nuclear accidents — Management. I. International Atomic Energy Agency. II. Series.

IAEAL

06-00461

FOREWORD

by Mohamed ElBaradei
Director General

The IAEA's Statute authorizes the Agency to establish safety standards to protect health and minimize danger to life and property — standards which the IAEA must use in its own operations, and which a State can apply by means of its regulatory provisions for nuclear and radiation safety. A comprehensive body of safety standards under regular review, together with the IAEA's assistance in their application, has become a key element in a global safety regime.

In the mid-1990s, a major overhaul of the IAEA's safety standards programme was initiated, with a revised oversight committee structure and a systematic approach to updating the entire corpus of standards. The new standards that have resulted are of a high calibre and reflect best practices in Member States. With the assistance of the Commission on Safety Standards, the IAEA is working to promote the global acceptance and use of its safety standards.

Safety standards are only effective, however, if they are properly applied in practice. The IAEA's safety services — which range in scope from engineering safety, operational safety, and radiation, transport and waste safety to regulatory matters and safety culture in organizations — assist Member States in applying the standards and appraise their effectiveness. These safety services enable valuable insights to be shared and I continue to urge all Member States to make use of them.

Regulating nuclear and radiation safety is a national responsibility, and many Member States have decided to adopt the IAEA's safety standards for use in their national regulations. For the Contracting 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 designers, manufacturers and operators around the world to enhance nuclear and radiation safety in power generation, medicine, industry, agriculture, research and education.

The IAEA takes seriously the enduring challenge for users and regulators everywhere: that of ensuring a high level of safety in the use of nuclear materials and radiation sources around the world. Their continuing utilization for the benefit of humankind must be managed in a safe manner, and the IAEA safety standards are designed to facilitate the achievement of that goal.

Copyright International Atomic Energy Agency
 Provided by IHS Markit under license with IAEA
 No reproduction or networking permitted without license from IHS
Full document details: IAEA SF-1 2006

AVA Documents
Document Sharing Hub

PREFACE BY THE JOINT SPONSORING ORGANIZATIONS

The Board of Governors approved the publication of IAEA safety standards in the Safety Fundamentals category on the safety of nuclear installations in June 1993¹, on the safety of radioactive waste management in March 1995² and on radiation protection and the safety of radiation sources in June 1995³.

In 1995, the Board requested the IAEA Secretariat to consider, at an appropriate time, the revision of the three Safety Fundamentals texts with the aim of combining them in a unified set of principles representing a common safety philosophy across all areas of application of the IAEA safety standards.

The distinction traditionally made between nuclear safety and radiation protection is hardly justifiable at the conceptual level. The principles for nuclear safety and radiation protection in the three Safety Fundamentals publications were technically compatible, but had been expressed differently.

In 2000, the Secretariat commenced the process of holding drafting meetings to prepare a text on a unified set of principles. The draft Safety Fundamentals text was developed by seeking a broad international consensus of opinion to provide assurance that the Fundamental Safety Principles are held by all IAEA Member States.

The Fundamental Safety Principles are jointly sponsored with the European Atomic Energy Community (Euratom), the Food and Agriculture Organization of the United Nations (FAO), the International Labour Organization (ILO), the International Maritime Organization (IMO), the OECD Nuclear Energy Agency (OECD/NEA), the Pan American Health Organization (PAHO), the United Nations Environment Programme (UNEP) and the World Health Organization (WHO) (the sponsoring organizations).

Application of the Fundamental Safety Principles will facilitate the application of international safety standards and will make for greater

¹ INTERNATIONAL ATOMIC ENERGY AGENCY, The Safety of Nuclear Installations, Safety Series No. 110, IAEA, Vienna (1993).

² INTERNATIONAL ATOMIC ENERGY AGENCY, The Principles of Radioactive Waste Management, Safety Series No. 111-F, IAEA, Vienna (1995).

³ FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANISATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, WORLD HEALTH ORGANIZATION, Radiation Protection and the Safety of Radiation Sources, Safety Series No. 120, IAEA, Vienna (1996).

consistency between the arrangements of different States. It is therefore desirable that all States adhere to and advocate these principles. The principles will be binding on the IAEA in relation to its operations and on States in relation to operations assisted by the IAEA. States or sponsoring organizations may adopt the principles, at their own discretion, for application to their own activities.

In the preparation of the present text of the Fundamental Safety Principles, all the safety principles established in the earlier Safety Fundamentals publications for the three different areas were considered and consolidated into a coherent and consistent set of ten new principles. Some of the earlier safety principles that were found to be more appropriately expressed as requirements have been established as such in Safety Requirements publications.

The ten new Fundamental Safety Principles constitute the basis on which to establish safety requirements for protection against exposure to ionizing radiation under the IAEA's safety standards programme and provide the rationale for its wider safety related programme.

The totality of safety measures taken to ensure the protection of human life and health and the environment against exposure to radiation is detailed and technically complex. To the extent possible, however, the Fundamental Safety Principles have been drafted in language that is understandable to the non-specialist reader. The intention is to convey the basis and rationale for the safety standards for those at senior levels in government and regulatory bodies and those who, while responsible for making decisions concerning the uses of nuclear energy and radiation sources, may not be specialists in nuclear or radiation science and technology or in radiation protection and safety matters.

Unless otherwise stated, the usage of safety related words and terms in the text is to be interpreted as defined and explained in the IAEA Safety Glossary (<http://www-ns.iaea.org/standards/safety-glossary.htm>), in which usage in the different subject areas has been harmonized and where possible made consistent. Some generalized safety related words and terms have been used for the purpose of simplifying the text, and in these cases the meaning has been explained in footnotes. For the purpose of formulating safety requirements in specific areas, it may be necessary to clarify and elaborate on the meaning of terms — whose general meaning may be clear — in their context in specific standards to avoid ambiguity. Such clarifications and elaborations are left to the particular safety standards concerned.

The text was approved for promulgation as a Safety Fundamentals publication by the IAEA's Board of Governors in September 2006, and this Safety Fundamentals publication thus becomes the primary publication in the

IAEA Safety Standards Series, superseding the previous Safety Fundamentals publications issued in the former Safety Series.

The IAEA wishes to express its appreciation to all those who assisted in the drafting and review of this text and in the process of reaching a consensus.
