IAEA Publications

# Catalogue

2016–2017

IAEA 60 Years
Atoms for Peace and Development

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## Atoms for Peace

The IAEA serves as the world's intergovernmental forum for scientific and technical cooperation in the nuclear field. It was set up as the world's "Atoms for Peace" organization in 1957 within the United Nations family. The IAEA works with its Member States and multiple partners worldwide to promote safe, secure and peaceful nuclear technologies.

The IAEA's mission is guided by the interests and needs of Member States, strategic plans and the vision embodied in the IAEA Statute. Three main pillars — or areas of work — underpin the IAEA's mission: Safety and Security; Science and Technology; and Safeguards and Verification.

## IAEA Publications

The IAEA is one of the leading publishers in the field of nuclear science and technology, with titles on nuclear and radiological safety, emergency response, nuclear power, nuclear medicine, nuclear waste management, nuclear law and safeguards as well as relevant topics in food and agriculture, earth science, industry and the environment.

Key publications include the IAEA Safety Standards, which detail the principles of safety for protection against ionizing radiation, and IAEA Safety Reports, which describe good practices and give practical examples and detailed methods that can be used to meet safety requirements.

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# IAEA Publications
# Catalogue

## 2016–2017

Full Details of Publications Published 2015–2016,
Forthcoming Publications 2016–2017 and a
Stocklist of Publications Published 2013–2016

# INTRODUCTION

This publications catalogue lists all sales publications of the IAEA published in 2015–2016 and those forthcoming in 2016–2017.

Most IAEA publications are issued in English; some are also available in Arabic, Chinese, French, Russian or Spanish. This is indicated at the bottom of the book entry.

Most publications are issued in softcover. The icons and indicate the following.

Hardback book

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A complete listing of all IAEA priced publications is available on the IAEA's web site: http://www.iaea.org/books

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Prices of books are quoted in Euros and are subject to change without notice. The customer is responsible for the payment of any local taxes or duties. Shipping will be charged at cost. Publications are normally sent by surface mail. Delivery by air mail, courier service or by air freight is possible upon request.

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## Discounts

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Customers from developing countries are entitled to a discount of 35% or 75%. Please contact the Marketing and Sales Unit for more information.

## Standing Orders

To set up a standing order for one of the book series, or for books in a particular subject area, please contact the Marketing and Sales Unit.

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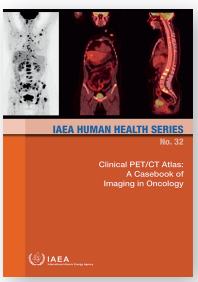
# MEDICAL PHYSICS, DOSIMETRY AND DIAGNOSIS

## Atlas of Skeletal SPECT/CT Clinical Images

### IAEA Human Health Series No. 34

The atlas focuses specifically on single photon emission computed tomography/computed tomography (SPECT/CT) in musculoskeletal imaging, and thus illustrates the inherent advantages of the combination of the metabolic and anatomical components in a single procedure. In addition, the atlas provides information on the usefulness of several sets of specific indications. The publication, which serves more as a training tool rather than a textbook, will help to further integrate the SPECT and CT experience in clinical practice by presenting a series of typical cases with many different patterns of SPECT/CT seen in bone scintigraphy.

**(Forthcoming 2016) • ISBN 978-92-0-103416-8 • STI/PUB/1748 • €75.00**

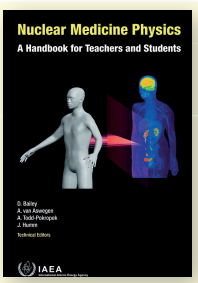



## Clinical PET/CT Atlas: A Casebook of Imaging in Oncology

### IAEA Human Health Series No. 32

Integrated positron emission tomography/computed tomography (PET/CT) has evolved since its introduction into the commercial market more than a decade ago. It is now a key procedure, particularly in oncological imaging. Over the last years in routine clinical service, PET/CT has had a significant impact on diagnosis, treatment planning, staging, therapy, and monitoring of treatment response and has therefore played an important role in the care of cancer patients. The high sensitivity from the PET component and the specificity of the CT component give this hybrid imaging modality the unique characteristics that make PET/CT, even after over 10 years of clinical use, one of the fastest growing imaging modalities worldwide. This publication combines over 90 comprehensive cases covering all major indications of fluorodeoxyglucose (18F-FDG)-PET/CT as well as some cases of clinically relevant special tracers. The cases provide an overview of what the specific disease can look like in PET/CT, the typical pattern of the disease's spread as well as likely pitfalls and teaching points. This PET/CT Atlas will allow professionals interested in PET/CT imaging to embrace the variety of oncological imaging by providing clinically relevant teaching files on the effectiveness and diagnostic quality of FDG-PET/CT imaging in routine applications.

**(201 pp., 98 figs; 2015) • ISBN 978-92-0-101115-2 • STI/PUB/1680 • €70.00**

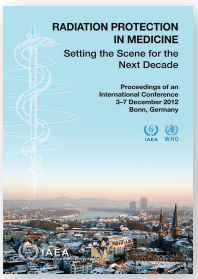



## Nuclear Medicine Physics

### *A Handbook for Teachers and Students*

This publication provides the basis for the education of medical physicists initiating their university studies in the field of nuclear medicine. The handbook includes 20 chapters and covers topics relevant to nuclear medicine physics, including basic physics for nuclear medicine, radionuclide production, imaging and non-imaging detectors, quantitative nuclear medicine, internal dosimetry in clinical practice and radionuclide therapy. It provides, in the form of a syllabus, a comprehensive overview of the basic medical physics knowledge required for the practice of medical physics in modern nuclear medicine.

**(736 pp., 237 figs; 2015) • ISBN 978-92-0-143810-2 • STI/PUB/1617 • €105.00**



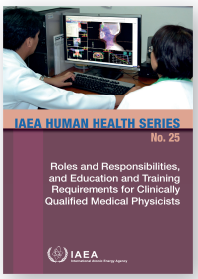

## Radiation Protection in Medicine: Setting the Scene for the Next Decade

***Proceedings of an International Conference Held in Bonn, Germany, 3–7 December 2012***

**Proceedings Series**

Presenting the proceedings of the International Conference on Radiation Protection in Medicine: Setting the Scene for the Next Decade, the publication aims to indicate gaps in current approaches to radiation protection in medicine; identify tools for improving radiation protection in medicine; review advances, challenges and opportunities in the field; and assess the impact of the international action plan for the radiation protection of patients, in order to prepare new international recommendations. The Conference drew up the 10-point Bonn Call for Action, which identifies responsibilities of and proposes priorities for stakeholders regarding radiation protection in medicine for the next decade.

**(429 pp., 26 figs; 2015) • ISBN 978-92-0-103914-9 • STI/PUB/1663 • €130.00**

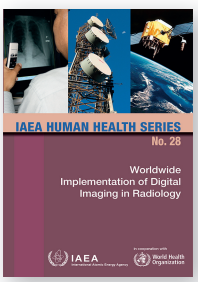



## Roles and Responsibilities, and Education and Training Requirements for Clinically Qualified Medical Physicists

**IAEA Human Health Series No. 25**

This publication addresses the shortfall of well trained and clinically qualified medical physicists working in radiation medicine. The roles, responsibilities and clinical training requirements of medical physicists have not always been well defined or well understood by health care professionals, health authorities and regulatory agencies. To fill this gap, this publication provides recommendations for the academic education and clinical training of clinically qualified medical physicists, including recommendations for their accreditation certification and registration, along with continuous professional development. The goal is to establish criteria that support the harmonization of education and clinical training worldwide.

**English Edition (71 pp., 2 figs; 2013) • ISBN 978-92-0-142010-7 • STI/PUB/1610 • €32.00**
**French Edition (77 pp., 2 figs; 2015) • ISBN 978-92-0-207114-8 • STI/PUB/1610 • €32.00**
**Russian Edition (85 pp., 2 figs; 2015) • ISBN 978-92-0-409414-5 • STI/PUB/1610 • €32.00**
**Spanish Edition (73 pp., 2 figs; 2014) • ISBN 978-92-0-304514-8 • STI/PUB/1610 • €32.00**




## Worldwide Implementation of Digital Imaging in Radiology

**IAEA Human Health Series No. 28**

Providing a basic introduction to digital technology and digital networks, the publication also gives an overview of the issues to consider when implementing such technology in diagnostic radiology. In an area that is under rapid development, it provides a careful analysis of the principles and advice on implementation and sustainability of digital imaging and teleradiology. The transition from film to digitally based medical imaging is complex and requires knowledge and planning to be successful. This comprehensive resource guide contains information on the needs and implications of a transition to digital imaging with case studies for different facilities requiring different levels of communication connectivity. It is aimed at hospital administrators and managers, radiologists and radiographers/technologists, medical physicists and clinical engineers as well as information technology staff.

**(195 pp., 14 figs; 2015) • ISBN 978-92-0-102114-4 • STI/PUB/1647 • €60.00**

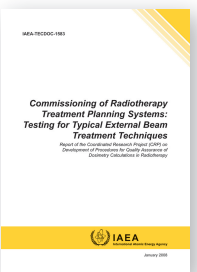
# RADIOTHERAPY

## Accuracy Requirements and Uncertainties in Radiotherapy

**IAEA Human Health Series No. 31**

Accuracy requirements in radiation oncology have been defined in multiple publications; however, these have been based on differing radiation technologies. In the meantime, the uncertainties in radiation dosimetry reference standards have been reduced and more detailed patient outcome data are available. No comprehensive literature on accuracy and uncertainties in radiotherapy has been published so far. The IAEA has therefore developed a new international consensus document on accuracy requirements and uncertainties in radiation therapy, to promote safer and more effective patient treatments. This publication addresses accuracy and uncertainty issues related to the vast majority of radiation therapy departments including both external beam radiotherapy and brachytherapy. It covers clinical, radiobiological, dosimetric, technical and physical aspects.

**(Forthcoming 2016) • ISBN 978-92-0-100815-2 • STI/PUB/1679 • €76.00**




## Commissioning of Radiotherapy Treatment Planning Systems: Testing for Typical External Beam Treatment Techniques

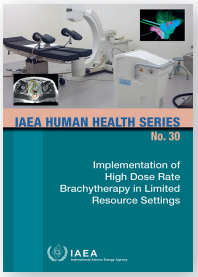
***Report of the Coordinated Research Project on Development of Procedures for Quality Assurance of Dosimetry Calculations in Radiotherapy***

**IAEA TECDOC Series No. 1583**

This publication is intended as a guide for the clinical commissioning of radiotherapy treatment planning systems (RTPSs) and provides a simple protocol for these tasks. The procedures for clinical commissioning tests cover typical treatment techniques used in radiotherapy hospitals and are based on the use of a specific phantom. The purpose of this testing is twofold. Firstly, the tests will provide an educational opportunity for the user to become familiar with the operation of the RTPS. Secondly, the tests will demonstrate to the user that the logistic chain starting from CT scanning, anatomic

modelling, treatment planning and MU calculation is operable and leads to the desired results with sufficient accuracy.

**CD Edition (2011) • ISBN 978-92-0-169910-7 • IAEA-TECDOC-1583 • €18.00**
**English Edition (2008) • ISBN 978-92-0-100508-3 • IAEA-TECDOC-1583 • €15.00**
**Russian Edition (2016) • ISBN 978-92-0-400616-2 • IAEA-TECDOC-1583 • €18.00**

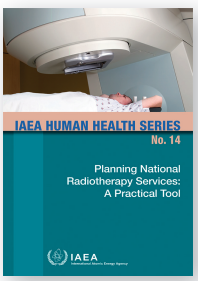



## Implementation of High Dose Rate Brachytherapy in Limited Resource Settings

### IAEA Human Health Series No. 30

Brachytherapy is an essential component of the curative treatment of cervical cancer, a disease with high incidence in many developing countries. The IAEA supports the use of high dose rate (HDR) brachytherapy for centres with a large number of patients with this disease. HDR brachytherapy is also used in other common cancers such as breast, lung, oesophagus and prostate cancer. This publication provides guidance to radiation oncologists, medical physicists and planners on establishing and operating an HDR brachytherapy unit with modern standards, and presents the main issues to be addressed for its effective and safe operation.

**(97 pp., 21 figs; 2015) • ISBN 978-92-0-107214-6 • STI/PUB/1670 • €45.00**

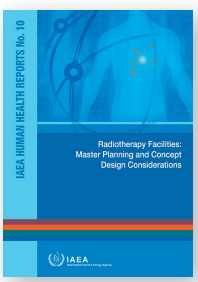



## Planning National Radiotherapy Services: A Practical Tool

### IAEA Human Health Series No. 14

The current and future burden of cancer incidence in developing countries requires the planning, establishment and upgrading of radiotherapy services at the national level. This publication is a practical guide outlining the main issues at stake when planning national radiotherapy services. It provides an assessment of the cancer burden, evaluates the existing resources, and determines what is needed and how to cover the gap in a resource oriented rational way. The publication will be of practical value to decision makers and programme managers in public health facing the organization or reorganization of radiotherapy services in their countries.

**English Edition (83 pp., 9 figs; 2011) • ISBN 978-92-0-105910-9 • STI/PUB/1462 • €34.00**
**Russian Edition (101 pp., 9 figs; 2015) • ISBN 978-92-0-407615-8 • STI/PUB/1462 • €34.00**

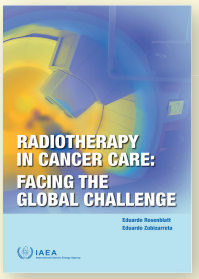



## Radiotherapy Facilities: Master Planning and Concept Design Considerations

### IAEA Human Health Reports No. 10

This publication provides guidelines on how to plan a radiotherapy facility in terms of the strategic master planning process including the legal, technical and infrastructure requirements. It outlines a risk assessment methodology and a typical project work plan, and describes the professional expertise required for the implementation of such a project. Generic templates for a block design are suggested, which include possibilities for future expansion. These templates can be overlaid onto the designated site such that the most efficient workflow between the main functional areas can be ensured. A sample checklist is attached to act as a guideline for project management and to indicate the critical stages in the process where technical expert assistance may be needed. The publication is aimed at professionals and administrators involved in infrastructure development, planning and facility management, as well as engineers, building contractors and radiotherapy professionals.

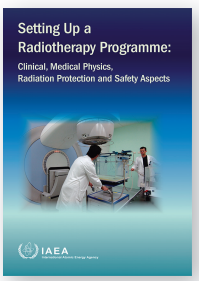
**English Edition (31 pp., 7 figs; 2014) • ISBN 978-92-0-101914-1 • STI/PUB/1645 • €29.00**
**Russian Edition (35 pp., 7 figs; 2015) • ISBN 978-92-0-407515-1 • STI/PUB/1645 • €29.00**




## Radiotherapy in Cancer Care: Facing the Global Challenge

Cancer treatment is complex and calls for a diverse set of services. Radiation therapy is recognized as an essential tool in the cure and palliation of cancer. Currently, access to radiation treatment is limited in many countries and non-existent in some. This lack of radiation therapy resources exacerbates the burden of disease and underscores the continuing health care disparity among States. Closing this gap represents an essential measure in addressing this global health equity problem. This publication presents a comprehensive overview of the major topics and issues to be taken into consideration when planning a strategy to address this problem, in particular in low and middle income countries. With contributions from leaders in the field, it provides an introduction to the achievements and issues of radiation therapy as a cancer treatment modality around the world. Dedicated chapters focus on the new radiotherapy technologies, proton beams, carbon ion, intraoperative radiotherapy, radiotherapy for children, treatment of HIV-AIDS malignancies, and costing and quality management issues.

**(Forthcoming 2016) • ISBN 978-92-0-115013-4 • STI/PUB/1638 • €62.00**




## Setting Up a Radiotherapy Programme

### *Clinical, Medical Physics, Radiation Protection and Safety Aspects*

This publication provides guidance for designing and implementing radiotherapy programmes, taking into account clinical, medical physics, radiation protection and safety aspects. It reflects current requirements for radiotherapy infrastructure in settings with limited resources. It will be of use to professionals involved in the development, implementation and management of radiotherapy programmes.

**English Edition (255 pp., 10 figs; 2008) • ISBN 92-0-101807-X • STI/PUB/1296 • €55.00**

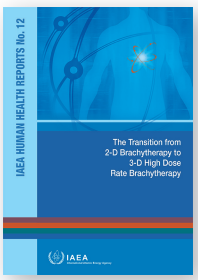
**Russian Edition (265 pp., 10 figs; 2015) • ISBN 978-92-0-404615-1 • STI/PUB/1296 • €55.00**

### Staffing in Radiotherapy: An Activity Based Approach

**IAEA Human Health Reports No. 13**

Radiotherapy requires competent professional staff to ensure safe and effective patient treatment and management. There is a need to provide guidelines that recommend appropriate staffing levels to support the initiation of new services as well as the expansion or upgrade of existing services. Even simple upgrades, or replacement of existing equipment, may have a significant impact on staffing needs. Similarly, the introduction of education and training programmes will require staffing adjustments. A calculation algorithm has been developed to predict staffing levels based on the inputs that are known or can be easily estimated. This publication complements other IAEA publications used to support the initiation of basic radiation medicine services including Setting up a Radiotherapy Programme: Clinical, Medical Physics, Radiation Protection and Safety Aspects, published in 2008.

**CD Edition (2015) • ISBN 978-92-0-156715-4 • STI/PUB/1705 • €45.00**




### The Transition from 2-D Brachytherapy to 3-D High Dose Rate Brachytherapy

**IAEA Human Health Reports No. 12**

Brachytherapy is a major treatment modality in the treatment of common cancers including cervical cancer. This publication addresses the recent technological change in brachytherapy treatment planning with better access to 3-D volumetric patient imaging modalities including computed tomography (CT) and magnetic resonance (MR) as opposed to traditional 2-D planar images. In the context of 2-D and 3-D brachytherapy, the publication provides definitions, clinical indications, transitioning milestones, commissioning steps, quality assurance measures, and a related questionnaire. Staff training and resourcing are also addressed. The publication will serve as a guide to radiotherapy departments that wish to make the transition from 2-D to 3-D brachytherapy.

**(33 pp., 8 figs; 2015) • ISBN 978-92-0-101415-3 • STI/PUB/1681 • €23.00**

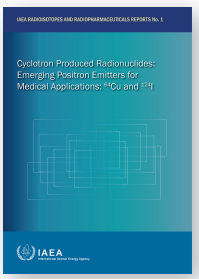
## NUCLEAR MEDICINE (INCLUDING RADIOPHARMACEUTICALS)

### Accelerator-based Alternatives to Non-HEU Production of Technetium-99m

**IAEA Radioisotopes and Radiopharmaceuticals Reports No. 2**

This publication presents a comprehensive overview of the technologies involved in the production of cyclotron based 99mTc. These would include techniques relevant to preparation of targets, irradiation of targets under high beam currents, target processing, target recovery and quality control of the final product. The publication provides broad information, well supported with references, on improved production routes and improved separation and purification of cyclotron based 99mTc. These approaches achieve high specific activity and chemical purity of 99mTc suitable for labelling molecules of medical interest and also enable spare capacity to be available at medical cyclotron centres. The readership of this publication is scientists interested in translating this technology to practice, technologists already working with cyclotrons wanting to enhance the utility of the existing machines and managers who are in the process of setting up facilities in their countries. Students working towards higher level degrees in related fields may also benefit from this publication.

**(Forthcoming 2016) • ISBN 978-92-0-102916-4 • STI/PUB/1743 • €33.00**




### Cyclotron Produced Radionuclides: Emerging Positron Emitters for Medical Applications: 64Cu and 124I

**IAEA Radioisotopes and Radiopharmaceuticals Reports No. 1**

The growing number of medical cyclotrons and positron emission tomography/computed tomography (PET/CT) centres as well as the proven high clinical utility of fluorodeoxyglucose (FDG) in cancer patients has led to interest in possibilities for the use of PET tracers which are in different stages of clinical evaluation. This publication presents the outcome of an IAEA coordinated research project on this topic and provides a comprehensive overview of the technologies involved in the production of 64Cu and 124I, techniques on preparation of targets, irradiation of targets under high beam currents, target processing, target recovery and labelling. It provides guidance to enhance 64Cu and 124I production and applications. This book will appeal to scientists and technologists involved in putting cyclotron based radioisotope production into practice, as well as postgraduate students in the field.

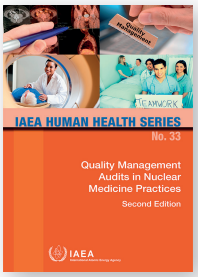
**(63 pp., 38 figs; 2016) • ISBN 978-92-0-109615-9 • STI/PUB/1717 • €38.00**

## Good Practice for Introducing Radiopharmaceuticals for Clinical Use

### IAEA TECDOC Series No. 1782

The use of new radiopharmaceuticals can provide extremely valuable information in the evaluation of cancer, as well as heart and brain diseases — information that often cannot be obtained by other means. However, there is a perceived need in many Member States for a useful reference to facilitate and expedite the introduction of radiopharmaceuticals already in clinical use in other countries. This publication intends to provide practical support for the introduction of new radiotracers, including recommendations on the necessary steps needed to facilitate and expedite the introduction of radiopharmaceuticals in clinical use, while ensuring that a safe and high quality product is administered to the patient at all times.

**(2015) • ISBN 978-92-0-111215-6 • IAEA-TECDOC-1782 • €18.00**



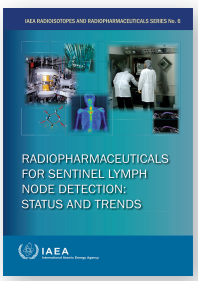

## Quality Management Audits in Nuclear Medicine Practices

***Second Edition***

### IAEA Human Health Series No. 33

Quality management systems are essential and should be maintained with the intent to continuously improve effectiveness and efficiency, enabling nuclear medicine to achieve the expectations of its quality policy, satisfy its customers and improve professionalism. The quality management (QM) audit methodology in nuclear medicine practice, introduced in this publication, is designed to be applied to a variety of economic circumstances. A key outcome is a culture of reviewing all processes of the clinical service for continuous improvement in nuclear medicine practice. Regular quality audits and assessments are vital for modern nuclear medicine services. More importantly, the entire QM and audit process has to be systematic, patient oriented and outcome based. The management of services should also take into account the diversity of nuclear medicine services around the world and multidisciplinary contributions. The latter include clinical, technical, radiopharmaceutical, medical physics and radiation safety procedures.

**(83 pp., 7 figs; 2015) • ISBN 978-92-0-101715-4 • STI/PUB/1683 • €45.00**

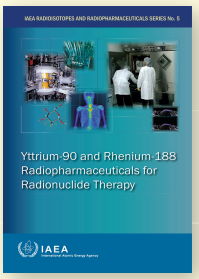



## Radiopharmaceuticals for Sentinel Lymph Node Detection: Status and Trends

### IAEA Radioisotopes and Radiopharmaceuticals Series No. 6

This book summarizes the current status and future trends in the development of radiopharmaceuticals for sentinel lymph node detection (SLND), an essential diagnostic tool for the effective treatment of superficial cancers such as breast tumours and melanoma. The publication covers all current aspects of this diagnostic methodology, including the production of nanocolloidal particles, their biological mechanism of action and relevant clinical applications. It also illustrates the recent developments in the field fuelled by the introduction of molecular imaging agents for SLND and of multimodality optical and radioactive agents. Included in the results presented in this book, are those on the novel generation of SLND radiopharmaceuticals obtained through an IAEA coordinated research project.

**(162 pp., 43 figs; 2015) • ISBN 978-92-0-109714-9 • STI/PUB/1674 • €39.00**



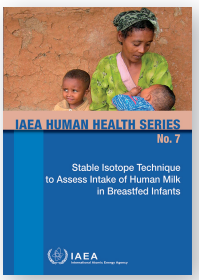

## Yttrium-90 and Rhenium-188 Radiopharmaceuticals for Radionuclide Therapy

### IAEA Radioisotopes and Radiopharmaceuticals Series No. 5

A key requirement for the effective implementation of the therapeutic approach, based on the intravenous administration of radiolabelled compounds (radionuclide therapy), is the sufficient availability of radionuclides with appropriate physical characteristics. Based on their nuclear properties, 188Re and 90Y are considered among the most interesting radionuclides for therapy. Furthermore, they are produced through portable generators, which give opportunities for ensuring a worldwide distribution of these radionuclides. This publication illustrates recent studies aimed at investigating efficient quality control methods to ensure both the radionuclidic purity of generator eluates, and the proper preparation of new target specific 188Re and 90Y radiopharmaceuticals for various clinical applications.

**(301 pp., 164 figs; 2015) • ISBN 978-92-0-103814-2 • STI/PUB/1662 • €52.00**

# NUTRITION




## Stable Isotope Technique to Assess Intake of Human Milk in Breastfed Infants

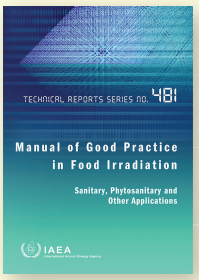
### IAEA Human Health Series No. 7

This publication was developed by an international group of experts as an integral part of the IAEA's efforts to contribute to the transfer of technology and knowledge in nutrition. Its aim is to assist Member States in their efforts to combat malnutrition by facilitating the use of relevant nuclear techniques. The stable (non-radioactive) isotope technique has been developed to assess intake of human milk in breastfed infants. The practical application of the stable isotope technique, based on analysis of deuterium by Fourier transform infrared spectrometry (FTIR), is presented in this book.

**English Edition (67 pp., 39 figs; 2010) • ISBN 978-92-0-114009-8 • STI/PUB/1429 • €32.00**
**French Edition (71 pp., 39 figs; 2015) • ISBN 978-92-0-207914-4 • STI/PUB/1429 • €32.00**
**Spanish Edition (71 pp., 39 figs; 2014) • ISBN 978-92-0- 308114-6 • STI/PUB/1429 • €32.00**

# FOOD AND AGRICULTURE

## FOOD IRRADIATION




### Manual of Good Practice in Food Irradiation

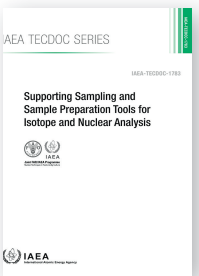
***Sanitary, Phytosanitary and Other Applications***

**Technical Reports Series No. 481**

Ensuring that the process of irradiating food delivers the desired result consistently is essential for the correct application of the technology and will help to inspire consumer confidence in irradiated food. This publication aims to help operators of irradiation facilities to appreciate and improve their practices and also to provide detailed, yet straightforward, technical information for stakeholders such as food regulators, manufacturers and traders, who also need to understand 'good practice'.

**(85 pp., 24 figs; 2015) • ISBN 978-92-0-105215-5 • STI/DOC/010/481 • €48.00**

## SOIL FERTILITY AND IRRIGATION



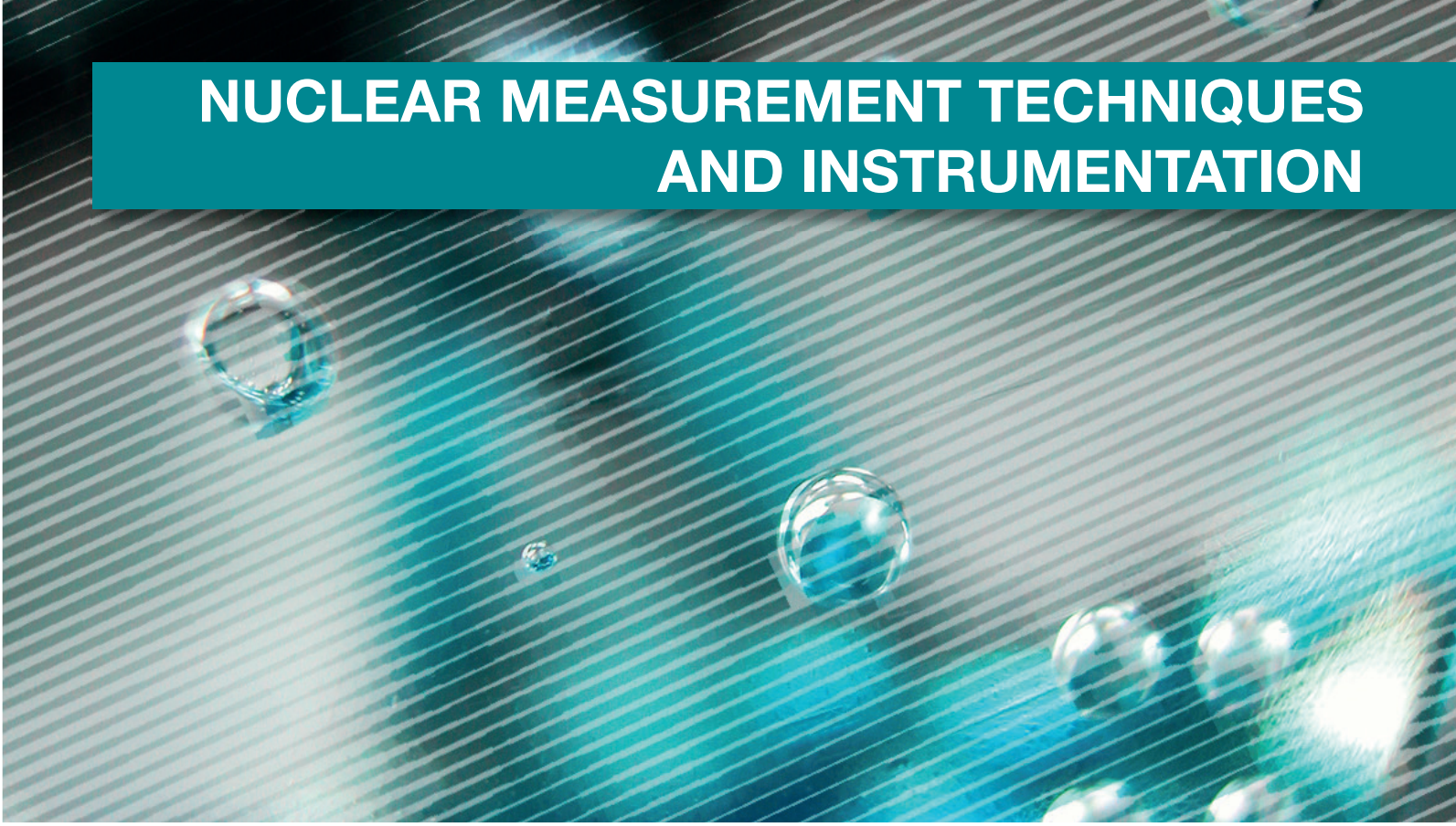

### Supporting Sampling and Sample Preparation Tools for Isotope and Nuclear Analysis

**IAEA TECDOC Series No. 1783**

Nuclear and related techniques can help develop climate-smart agricultural practices by optimizing water and nutrient use efficiency, assessing organic carbon sequestration in soil, and assisting in the evaluation of soil erosion control measures. Knowledge on the behaviour of radioactive materials in soil, water and foodstuffs is also essential in enhancing nuclear emergency preparedness and response. Appropriate sampling and sample preparation are the first steps to ensure the quality and effective use of the measurements and this publication provides comprehensive detail on the necessary steps.

**(2016) • ISBN 978-92-0-100416-1 • IAEA-TECDOC-1783 • €18.00**

# NUCLEAR MEASUREMENT TECHNIQUES AND INSTRUMENTATION



### Uses of Ionizing Radiation for Conservation for Tangible Cultural Heritage

**IAEA Radiation Technology Series No. 6**

The preservation of world cultural heritage is a key issue for maintaining national identity and understanding the influences or exchanges among civilizations throughout history. Development of appropriate preservation techniques that do not compromise longevity or authenticity are therefore of utmost importance. Radiation techniques have demonstrated significant success in the disinfestation and preservation of cultural heritage artefacts, and national and international research programmes have developed harmonized methodologies for such radiation treatment. This publication provides state of the art knowledge on radiation technology applied to the conservation and consolidation of items of cultural heritage and will be of use to collection curators, conservators, restorers, registrars, art historians, archaeologists and conservation scientists active in the various fields of cultural heritage in museums, libraries, archives, archaeological institutions, historical buildings and conservation workshops.

**(Forthcoming 2016) • ISBN 978-92-0-103316-1 • STI/PUB/1747 • €50.00**

## PHYSICS

### Accelerator Simulation and Theoretical Modelling of Radiation Effects (SMoRE)

**IAEA Nuclear Energy Series No. NF-T-2.2**

This publication summarizes the findings and conclusions of the IAEA coordinated research project (CRP) on accelerator simulation and theoretical modelling of radiation effects, aimed at supporting Member States in the development of advanced radiation-resistant structural materials for implementation in innovative nuclear systems. This aim can be achieved through enhancement of both experimental neutron-emulation capabilities of ion accelerators and improvement of the predictive efficiency of theoretical models and computer codes. This dual approach is challenging but necessary, because outputs of accelerator simulation experiments need adequate theoretical interpretation, and theoretical models and codes need high dose experimental data for their verification. Both ion irradiation investigations and computer modelling have been the specific subjects of the CRP, and the results of these studies are presented in this publication which also includes state-of-the-art reviews of four major aspects of the project: challenges and trends of structural materials development for present and future reactor designs, accelerator methodologies for material testing, multi-scale modelling tools, and advanced examination techniques.

**(Forthcoming 2016) • ISBN 978-92-0-107415-7 • STI/PUB/1732 • €39.00**

## CHEMISTRY

### Radiation Chemistry of Polysaccharides

This publication compiles research findings and details development activities relating to the development of radiation processed products made of natural polymers. An overview of current progress and recent achievements is included. Successes clearly indicate that radiation processing of natural polymers has emerged as an exciting area where the unique characteristics of these polymeric materials can be exploited for a variety of practical applications in agriculture, health care, industry and the environment.

**(Forthcoming 2016) • ISBN 978-92-0-101516-7 • STI/PUB/1731 • €75.00**

# NUCLEAR ANALYTICS

## Guidelines for the Development of a Quality Management System (QMS) on Training and Certification of Personnel for Non-destructive Testing (NDT)

### IAEA TECDOC Series No. 1772

A quality management system (QMS) can be expressed as the organizational structure or processes, procedures and resources needed to implement quality management. Such a system plays an important role in the sustainable training and certification of non-destructive testing (NDT), resulting in better management, technical competence, worldwide recognition and harmonization and competitiveness. The guidelines presented in this publication support developers and provide information on the part NDT plays in overall quality assurance (QA) programmes.

**(Forthcoming 2016) • ISBN 978-92-0-108115-5 • IAEA-TECDOC-1772 • €18.00**

## Supporting Sampling and Sample Preparation Tools for Isotope and Nuclear Analysis

### IAEA TECDOC Series No. 1783

Nuclear and related techniques can help develop climate-smart agricultural practices by optimizing water and nutrient use efficiency, assessing organic carbon sequestration in soil, and assisting in the evaluation of soil erosion control measures. Knowledge on the behaviour of radioactive materials in soil, water and foodstuffs is also essential in enhancing nuclear emergency preparedness and response. Appropriate sampling and sample preparation are the first steps to ensure the quality and effective use of the measurements and this publication provides comprehensive detail on the necessary steps.

**(2016) • ISBN 978-92-0-100416-1 • IAEA-TECDOC-1783 • €18.00**

## Use of Neutron Beams for Materials Research Relevant to the Nuclear Energy Sector

### IAEA TECDOC Series No. 1773

This publication is a compilation of the main results and findings of an IAEA coordinated research project (CRP) on development, characterization and testing of materials of relevance to nuclear energy sector using neutron beams. The document contains joint research results from nineteen institutions, which can be grouped into the main six technical areas: investigation of oxide dispersion-strengthened steels, research on zirconium based materials (including hydrogen uptake), investigations of welded structures and objects, results with irradiated materials, optimization of instruments for residual strain/stress measurements, and efforts towards standardization of neutron imaging. Particular emphasis was placed on variable environments during material characterization and testing as required by some applications such as intensive irradiation load, high temperature and high pressure conditions, and the presence of strong magnetic fields. The publication also includes some additional materials supplied by the international experts along with nineteen individual contributions describing the current status of use of diverse neutron beam techniques for materials research targeting the nuclear energy sector. These nineteen individual reports are available on CD-ROM attached to this publication. The publication will be of interest to physicists and engineers in the area of materials research, neutron beam scientists and personnel responsible for instruments, managers of neutron beam facilities, nuclear reactor designers and nuclear industry representatives.

**(2015) • ISBN 978-92-0-108915-1 • IAEA-TECDOC-1773 • €18.00**

# RESEARCH REACTORS AND PARTICLE ACCELERATORS (APPLICATIONS)

## Accelerator-based Alternatives to Non-HEU Production of Technetium-99m

### IAEA Radioisotopes and Radiopharmaceuticals Reports No. 2

This publication presents a comprehensive overview of the technologies involved in the production of cyclotron based 99mTc. These would include techniques relevant to preparation of targets, irradiation of targets under high beam currents, target processing, target recovery and quality control of the final product. The publication provides broad information, well supported with references, on improved production routes and improved separation and purification of cyclotron based 99mTc. These approaches achieve high specific activity and chemical purity of 99mTc suitable for labelling molecules of medical interest and also enable spare capacity to be available at medical cyclotron centres. The readership of this publication is scientists interested in translating this technology to practice, technologists already working with cyclotrons wanting to enhance the utility of the existing machines and managers who are in the process of setting up facilities in their countries. Students working towards higher level degrees in related fields may also benefit from this publication.

**(Forthcoming 2016) • ISBN 978-92-0-102916-4 • STI/PUB/1743 • €33.00**


## Feasibility of Producing Molybdenum-99 on a Small Scale Using Fission of Low Enriched Uranium or Neutron Activation of Natural Molybdenum

### Technical Reports Series No. 478

This publication documents the work performed within an IAEA coordinated research project (CRP) on developing techniques for small scale indigenous 99Mo production using low enriched uranium (LEU) fission or neutron activation. This captures the steps participants undertook in examining the feasibility of becoming small scale 99Mo producers. Most participants carried out work related to the entire production process, from target assembly through irradiation, planning for

target disassembly in hot cells, chemical processing of targets, quality control practices, and managing waste streams. Some participants focused on one particular area, for example, testing new methods for production of LEU foil for targets and the production of gel generators from 99Mo solution. The publication aggregates all of the work undertaken as part of the CRP in order to present the results as a whole.

**(168 pp., 80 figs; 2015) • ISBN 978-92-0-114713-4 • STI/DOC/010/478 • €44.00**

### History, Development and Future of TRIGA Research Reactors

**Technical Reports Series No. 482**

Due to its particular fuel design and resulting enhanced inherent safety features, TRIGA reactors (Training, Research, Isotopes, General Atomics) constitute a 'class of their own' among the large variety of research reactors built worldwide. This publication summarizes in a single document the information on the past and present of TRIGA research reactors and presents an outlook in view of potential issues to be solved by TRIGA operating organizations in the near future. It covers the historical development and basic TRIGA characteristics, followed by utilization, fuel conversion and ageing management of TRIGA research reactors. It continues with issues and challenges, introduction to the global TRIGA research reactor network and concludes with future perspectives. The publication is complemented with a CD-ROM to illustrate the historical developments of TRIGA research reactors through individual facility examples and experience.

**(Forthcoming 2016) • ISBN 978-92-0-102016-1 • STI/DOC/010/482 • €45.00**


### Research Reactor Benchmarking Database: Facility Specification and Experimental Data

**Technical Reports Series No. 480**

This publication contains the facility specifications, experiment descriptions, and corresponding experimental data for nine different research reactors covering a wide range of research reactor types, power levels and experimental configurations. Each data set was prepared in order to serve as a stand-alone resource of well documented experimental data, which can subsequently be used in benchmarking and validation of the neutronic and thermohydraulic computational methods and tools employed for improved utilization, operation and safety analysis of research reactors.

**CD Edition (2015) • ISBN 978-92-0-151714-2 • STI/DOC/010/480 • €39.00**

### Status of Accelerator Driven Systems Research and Technology Development

**IAEA TECDOC Series No. 1766**

One of the greatest challenges for nuclear energy is how to properly manage the highly radioactive waste generated during irradiation in nuclear reactors. Accelerator Driven Systems (ADSs) may offer new prospects and advantages for the transmutation of such high level nuclear waste. ADS or accelerator driven transmutation of waste (ATW) consists of a high power proton accelerator, a heavy metal spallation target that produces neutrons when bombarded by the high power beam, and a sub-critical core that is neutronically coupled to the spallation target. This publication provides a comprehensive state of the art of the ADS technology by representing the different ADS concepts proposed worldwide in the last 15 years, as well as the related R&D activities and demonstration initiatives carried out at national international level.

**(2015) • ISBN 978-92-0-105315-2 • IAEA-TECDOC-1766 • €18.00**

## NUCLEAR DATA

### Development of a Reference Database for Ion Beam Analysis

***Report of a Coordinated Research Project on Reference Database for Ion Beam Analysis***

**IAEA TECDOC Series No. 1780**

Ion beam analysis techniques are non-destructive analytical techniques used to identify the composition and provide elemental depth profiles in surface layers of materials. The applications of such techniques are diverse and include environmental control, cultural heritage and conservation and fusion technologies. Their reliability and accuracy depends strongly on our knowledge of the nuclear reaction cross sections, and this publication describes the coordinated effort to measure, compile and evaluate cross section data relevant to these techniques and make these data available to the user community through a comprehensive online database. It includes detailed assessments of experimental cross sections as well as attempts to benchmark these data against appropriate integral measurements.

**(2015) • ISBN 978-92-0-110515-8 • IAEA-TECDOC-1780 • €18.00**

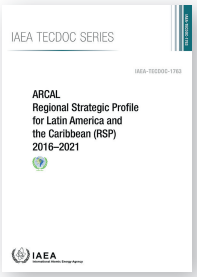

### Utilization of Accelerator Based Real Time Methods in Investigation of Materials with High Technological Importance

**IAEA Radiation Technology Reports No. 4**

This publication presents the state of the art in the development and application of various accelerator based real time techniques to materials investigation. It reports examples of multidisciplinary scientific topics and challenges where application of accelerator based methods would bring significant benefits in terms of research data and further understanding of the scientific issues. The research activities that can profit from real time material characterizations using synchrotron radiation, neutron, ion and electron beams, and simultaneous combinations of different techniques are also briefly discussed. A recurrent theme emerging from the presented papers is that further

work is needed to develop more robust and longer working life materials for energy applications.

**(104 pp., 66 figs; 2015) • ISBN 978-92-0-102314-8 • STI/PUB/1649 • €37.00**

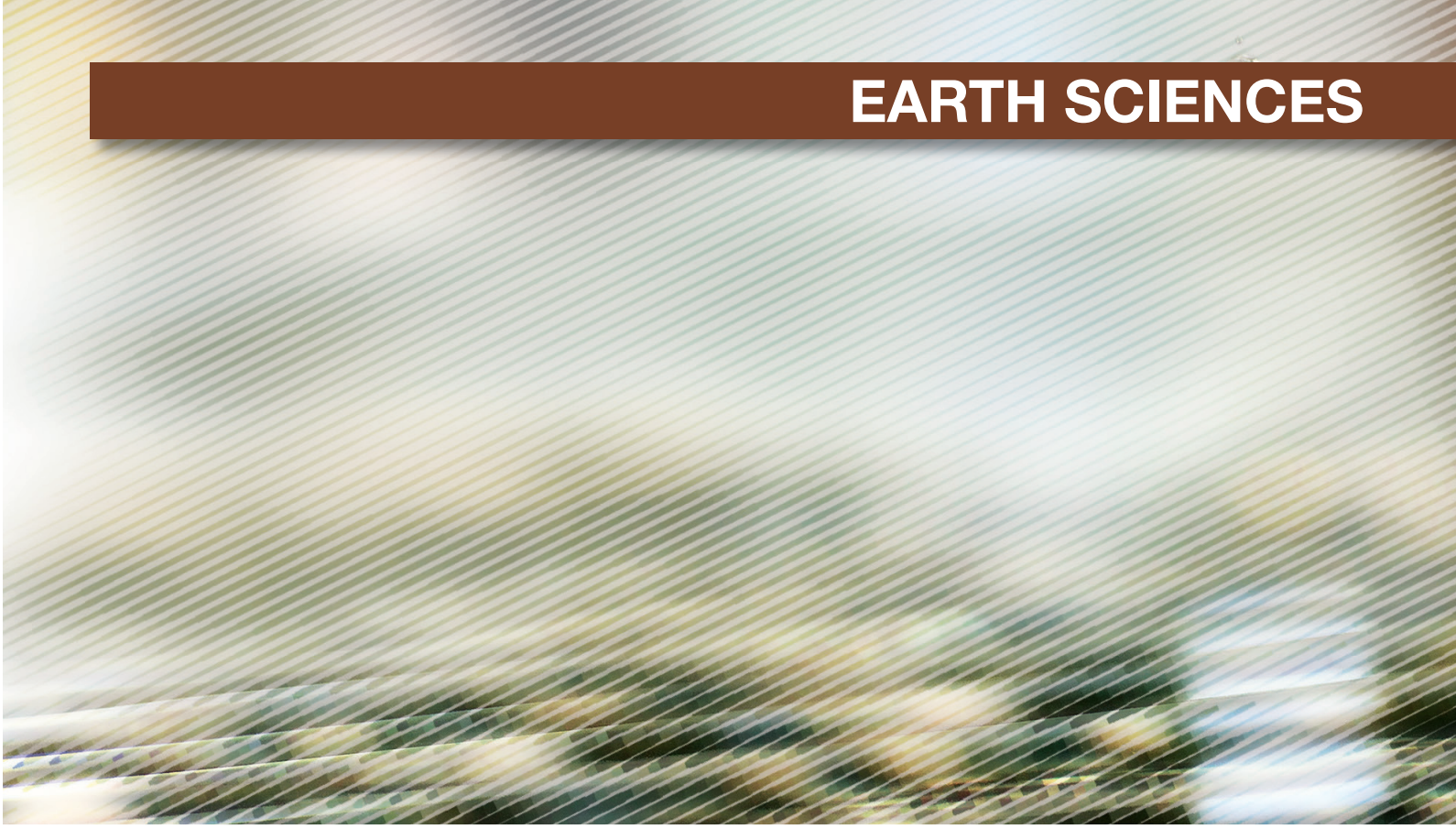



## ARCAL — Regional Strategic Profile for Latin America and the Caribbean (RSP) 2016–2021

### IAEA TECDOC Series No. 1763

This TECDOC presents the Regional Strategic Profile (RSP) for Latin America and the Caribbean for 2016–2021. The RSP reflects an assessment of the situation in the region made by the States Parties to the Regional Cooperation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL). It identifies the most pressing needs that can be addressed through nuclear technology. The 39 needs identified are classified into six thematic areas representing the priority areas within the scope of the new RSP: food security, human health, environment, energy, radiation safety and radiation technologies.

**English Edition (2015) • ISBN 978-92-0-106815-6 • IAEA-TECDOC-1763 • €18.00**
**Spanish Edition (2015) • ISBN 978-92-0-301615-5 • IAEA-TECDOC-1763 • €18.00**



# URANIUM GEOLOGY, EXPLORATION AND MINING

## Developments in In Situ Leach (ISL) Uranium Mining — Overview of ISL Operations

### IAEA Nuclear Energy Series No. NF-T-1.4

In situ leach or leaching (ISL) or in situ recovery (ISR) mining has become one of the standard uranium production methods. Its application to amenable uranium deposits (in certain sedimentary formations) has been growing in view of its competitive production costs and low surface impacts. This publication provides an historical overview and shows how ISL experience around the world can be used to direct the development of technical activities, taking into account environmental considerations, and emphasizing the economics of the process, including responsible mine closure. The publication provides information on how to design, operate and regulate current and future projects safely and efficiently, with a view to maximizing performance and minimizing negative environmental impact.

**(Forthcoming 2016) • ISBN 978-92-0-102716-0 • STI/PUB/1741 • €30.00**

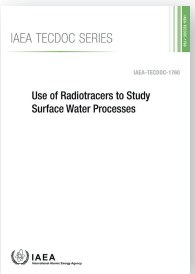
## Uranium Geology, Exploration, Resources, Production and Related Activities Volume 1: Africa

### IAEA Nuclear Energy Series No. NF-T-1.6

This publication summarizes important information relating to uranium supply and demand and incorporates data from previous publications, as well as from the International Uranium Resources Evaluation Project (IUREP), and other publicly available information and government data which have been collected and reviewed by experts. It focuses on Africa and provides a comprehensive reference source for uranium geology, exploration, resources, production and related activities in 53 countries. It will be useful to decision makers at all levels, including but not limited to, government officers in energy and mineral resource fields, exploration companies, geologists, geological surveys, energy utilities, universities, research institutions, and natural resource authorities.

**(Forthcoming 2016) • ISBN 978-92-0-102616-3 • STI/PUB/1740 • €70.00**

# HYDROLOGY

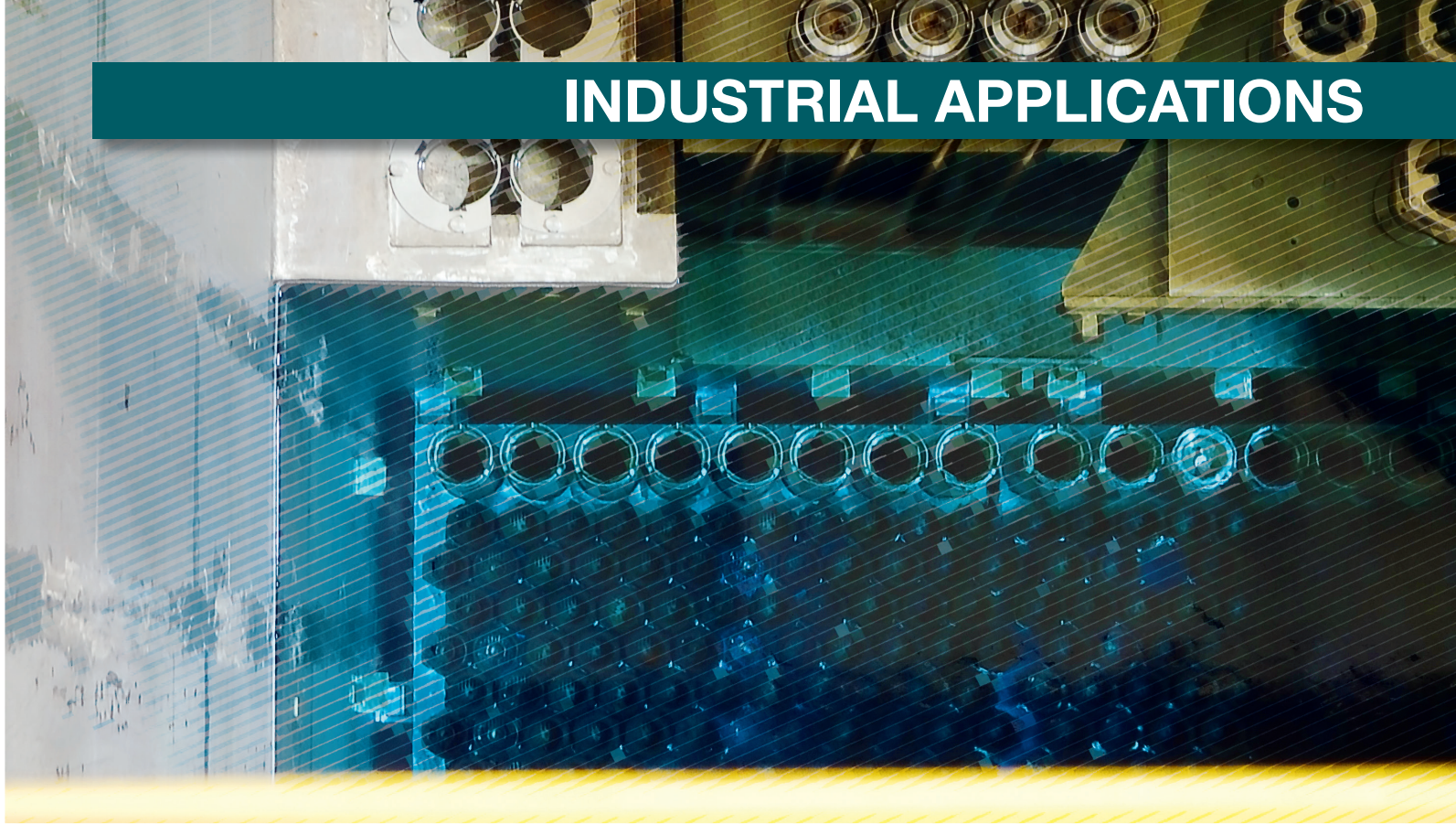



## Use of Radiotracers to Study Surface Water Processes

### IAEA TECDOC Series No. 1760

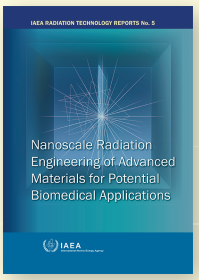
This publication presents a sound knowledge base for conducting radiotracer studies in the environment, with papers on radiotracer methodology, radiation protection and regulation, data analysis and modelling. Environmental case histories from five Member States — Australia, Brazil, France, the Republic of Korea and Sweden — are included. The publication summarizes the current status of radiotracer applications in surface water environments and addresses challenges to the use of radiotracers in the environment, such as dose assessment, public perception, regulatory status and gaps.

**(2015) • ISBN 978-92-0-100415-4 • IAEA-TECDOC-1760 • €18.00**



# INDUSTRIAL APPLICATIONS

## RADIATION PROCESSING

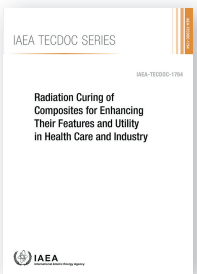



### Nanoscale Radiation Engineering of Advanced Materials for Potential Biomedical Applications

**IAEA Radiation Technology Reports No. 5**

There are critical needs for advanced materials in the area of biomaterial engineering, primarily in generating biomaterials of enhanced specific functionalities, such as improved biocompatibility and minimal natural rejection and with enhanced interfacial adhesion. These can be achieved by the introduction of proper functionalities at the nanoscale level. Radiation techniques are uniquely suited for such a task due to their favourable characteristics. This publication presents the results of an IAEA coordinated research project on nanoscale radiation engineering of advanced materials for potential biomedical applications, summarizing the achievements of the participating institutions.

**(214 pp., 176 figs; 2015) • ISBN 978-92-0-101815-1 • STI/PUB/1684 • €49.00**




### Radiation Curing of Composites for Enhancing Their Features and Utility in Health Care and Industry

**IAEA TECDOC Series No. 1764**

This publication is the final report of a coordinated research project (CRP) on radiation curing of composites for enhancing their features and utility in health care and industry. It presents achievements in the development of methodologies for new abrasion resistant coating formulations, radiation curable nanocomposites, new biodegradable packaging materials suitable for radiation sterilization and new methods to modify surface characteristic of nano-sized materials to enhance polymer fillers interaction. The results of the research work have proven that radiation processing is a technically and economically viable tool for the preparation of nanocomposites and nanomaterials. The research also demonstrated that radiation processing offers unique approaches to improve physico-chemical properties of composite materials in their final physical forms.

**(2015) • ISBN 978-92-0-103815-9 • IAEA-TECDOC-1764 • €18.00**

## TRACERS

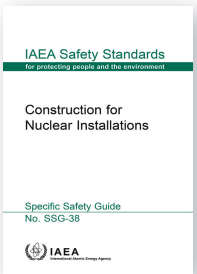
### Use of Radiotracers to Study Surface Water Processes

**IAEA TECDOC Series No. 1760**

This publication presents a sound knowledge base for conducting radiotracer studies in the environment, with papers on radiotracer methodology, radiation protection and regulation, data analysis and modelling. Environmental case histories from five Member States — Australia, Brazil, France, the Republic of Korea and Sweden — are included. The publication summarizes the current status of radiotracer applications in surface water environments and addresses challenges to the use of radiotracers in the environment, such as dose assessment, public perception, regulatory status and gaps.

**(2015) • ISBN 978-92-0-100415-4 • IAEA-TECDOC-1760 • €18.00**

# NUCLEAR AND RADIOLOGICAL SAFETY AND SECURITY



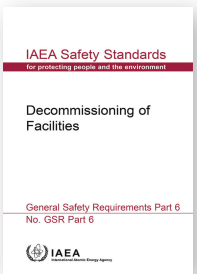

## Construction for Nuclear Installations

***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.

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



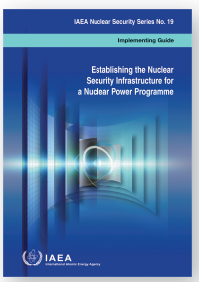

## Decommissioning of Facilities

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

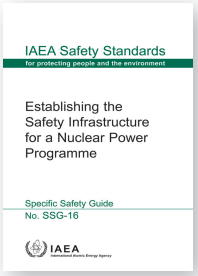



## Establishing the Nuclear Security Infrastructure for a Nuclear Power Programme

**IAEA Nuclear Security Series No. 19**

This publication provides guidance on the actions to be taken by a State in implementing an effective nuclear security infrastructure for a nuclear power programme. The topics covered are: development of national policy and strategy; common nuclear security measures; infrastructure issues relating to nuclear and other radioactive material; associated facilities; and cooperation with other States. The guidance provided is intended primarily for use by national policy makers, national legislators, competent authorities, institutions and individuals involved in the establishment, implementation, maintenance or sustainability of the nuclear security infrastructure for a nuclear power programme.

**Arabic Edition (79 pp., 1 fig.; 2015) • ISBN 978-92-0-609515-7 • STI/PUB/1591 • €29.00**
**English Edition (73 pp., 1 fig.; 2013) • ISBN 978-92-0-138010-4 • STI/PUB/1591 • €29.00**



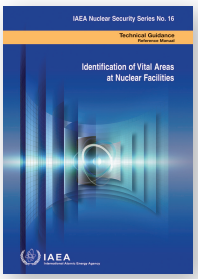

## Establishing the Safety Infrastructure for a Nuclear Power Programme

***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**

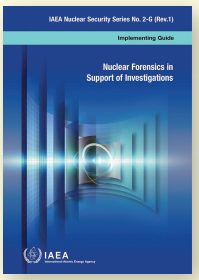



## Identification of Vital Areas at Nuclear Facilities

### IAEA Nuclear Security Series No. 16

This publication provides detailed guidance with regard to the identification of vital areas at nuclear facilities. It presents a structured approach to identifying those areas that contain equipment, systems and components to be protected against sabotage. The process for selection of a specific set of vital areas to be protected is based on consideration of the potential radiological consequences of sabotage, and on the design, operational and safety features of a nuclear facility. The method builds upon safety analysis to develop logic models for sabotage scenarios that could cause unacceptable radiological consequences. The sabotage actions represented in the logic models are linked to the areas from which they can be accomplished. The logic models are then analysed to determine areas that should be protected to prevent these unacceptable radiological consequences. The publication is part of a set of supporting publications in the IAEA Nuclear Security Series with the aim of assisting States in the design, implementation and evaluation of their physical protection systems for nuclear material and nuclear facilities.

**English Edition (37 pp., 2 figs; 2013) • ISBN 978-92-0-114410-2 • STI/PUB/1505 • €22.00**
**French Edition (39 pp., 2 figs; 2016) • ISBN 978-92-0-210915-5 • STI/PUB/1505 • €22.00**

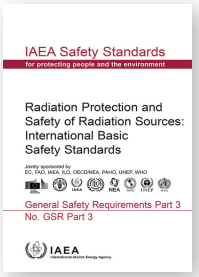



## Nuclear Forensics in Support of Investigations

### IAEA Nuclear Security Series No. 2-G (Rev. 1)

This publication is a revision of IAEA Nuclear Security Series No. 2, Nuclear Forensics Support, which was published in 2006. Since then, there has been substantive expansion and confidence in the application of nuclear forensics globally to effectively counter the threat of nuclear and other radioactive materials out of regulatory control. Most significantly, nuclear forensics has been applied in response to a number of incidents involving the illicit trafficking of highly enriched uranium and plutonium. The essential lessons learned from these experiences are incorporated in the revised publication to update the procedures and methods used in the conduct of a nuclear forensic examination as well as stress the importance of international cooperation.

**(80 pp., 2 figs; 2015) • ISBN 978-92-0-102115-1 • STI/PUB/1687 • €38.00**



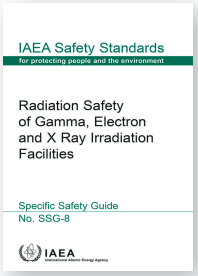

## Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards

***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**
**Russian Edition (477 pp., 2 figs; 2015) • ISBN 978-92-0-409915-7 • STI/PUB/1578 • €68.00**
**Spanish Edition (Forthcoming 2016) • ISBN 978-92-0-307915-0 • STI/PUB/1578 • €68.00**



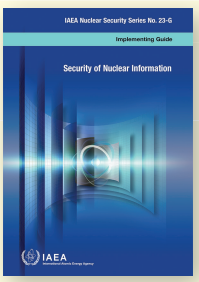

## Radiation Safety of Gamma, Electron and X Ray Irradiation Facilities

***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**

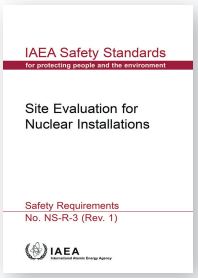



## Security of Nuclear Information

**IAEA Nuclear Security Series No. 23-G**

This publication provides guidance on implementing the principle of confidentiality and on the broader aspects of information security (i.e. integrity and availability). It assists States in bridging the gap between existing government and industry standards on information security, the particular concepts and considerations that apply to nuclear security and the special provisions and conditions that exist when dealing with nuclear material and other radioactive material. Specifically it seeks to assist States in the identification, classification, and assignment of appropriate security controls to information that could adversely impact nuclear security if compromised.

**(54 pp.; 2015) • ISBN 978-92-0-110614-8 • STI/PUB/1677 • €30.00**



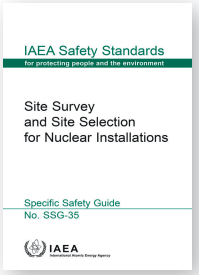

## Site Evaluation for Nuclear Installations

***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.

**(27 pp., 2 figs; 2016) • ISBN 978-92-0-106515-5 • STI/PUB/1709 • €35.00**



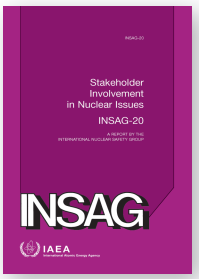

## Site Survey and Site Selection for Nuclear Installations

***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.

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



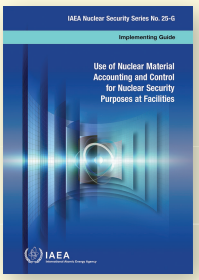

## Stakeholder Involvement in Nuclear Issues

***A Report by the International Nuclear Safety Group***

**INSAG Series No. 20**

Many of the world's nuclear power plants were constructed long ago without significant public involvement in the associated decision making. It is anticipated, however, that a variety of stakeholders will now seek participation in such decisions as the nuclear option is being revisited in many places. Accidents have also served to arouse public concern. The development of instantaneous media capabilities has created an awareness that may not have previously existed. Improvements in educational systems and the development of the Internet have made technical information and expertise available to individuals and locations that were previously without them. In addition, consideration of the environmental impacts of various energy strategies have moved to the fore. INSAG has concluded that the expectations of stakeholders of a right to participate in energy decisions are something that the nuclear community must address. Decisions regarding such matters as the siting and construction of a nuclear power plant are no longer something that is largely the domain of a closed community of technical experts and utility executives. Today, the concerns and expectations from a wide field of individuals and organizations must be considered. This report is intended for use by all stakeholders in the nuclear community, including national regulatory authorities, nuclear power plant designers and operators, public interest organizations, the media, and local and national populations.

**English Edition (16 pp.; 2006) • ISBN 92-0-111206-8 • STI/PUB/1276 • €12.00**
**Russian Edition (21 pp.; 2015) • ISBN 978-92-0-407715-5 • STI/PUB/1276 • €12.00**




### Use of Nuclear Material Accounting and Control for Nuclear Security Purposes at Facilities

**IAEA Nuclear Security Series No. 25-G**

Nuclear material accounting and control (NMAC) works in a complementary fashion with the international safeguards programme and physical protection systems to help prevent, deter or detect the unauthorized acquisition and use of nuclear materials. These three methodologies are employed by Member States to defend against external threats, internal threats and both state actors and non-state actors. This publication offers guidance for implementing NMAC measures for nuclear security at the nuclear facility level. It focuses on measures to mitigate the risk posed by insider threats and describes elements of a programme that can be implemented at a nuclear facility in coordination with the physical protection system for the purpose of deterring and detecting unauthorized removal of nuclear material.

**(63 pp.; 2015) • ISBN 978-92-0-101915-8 • STI/PUB/1685 • €30.00**

# URANIUM MINING AND MILLING

### Nuclear Security in the Uranium Extraction Industry

This publication provides States and operators with advice for defining, implementing, maintaining or enhancing their nuclear security regime for the protection of uranium ore concentrate against unauthorized removal. It defines prudent management practice as required by IAEA Nuclear Security Series No. 13, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), for this category of material. This advice can be adopted in the form of regulations or applied as voluntary standards. States, regulatory bodies, and industry may choose to tailor their implementation of this advice to meet their national circumstances.

**(2016) • ISBN 978-92-0-110815-9 • IAEA-TDL-003 • €18.00**

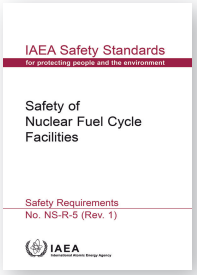
# FUEL FABRICATION AND STORAGE

### International Safeguards in the Design of Fuel Fabrication Plants

**IAEA Nuclear Energy Series No. NF-T-4.7**

This publication is the third in a series from the IAEA that provides guidance on the early consideration of safeguards requirements in the design and construction of nuclear facilities. It is principally intended for designers and operators of nuclear fuel fabrication facilities; however, vendors, state authorities and investors may also benefit from the information provided. This guidance is introductory rather than comprehensive; more detailed information on IAEA safeguards implementation can be found in the Guidance for States Implementing Comprehensive Safeguards Agreements and Additional Protocols (IAEA Services Series No. 21, December 2014) and other publications in that series. This document expands upon the general considerations addressed in International Safeguards in Nuclear Facility Design and Construction (Nuclear Energy Series No. NP-T-2.8, April 2013).

**(Forthcoming 2016) • ISBN 978-92-0-103315-4 • STI/PUB/1699 • €30.00**




### Safety of Nuclear Fuel Cycle Facilities

***Safety Requirements***

**IAEA Safety Standards Series No. NS-R-5 (Rev. 1)**

This publication covers the broad scope of requirements for fuel cycle facilities that, in light of the experience and present state of technology, must be satisfied to ensure safety for the lifetime of the facility. Topics of specific relevance include aspects of nuclear fuel generation, storage, reprocessing and disposal.

**Arabic Edition (107 pp., 4 figs; 2015) • ISBN 978-92-0-606015-5 • STI/PUB/1641 • €20.00**
**Chinese Edition (97 pp., 4 figs; 2015) • ISBN 978-92-0-500515-7 • STI/PUB/1641 • €20.00**
**English Edition (102 pp., 4 figs; 2014) • ISBN 978-92-0-100114-6 • STI/PUB/1641 • €20.00**
**Russian Edition (121 pp., 4 figs; 2016) • ISBN 978-92-0-410015-0 • STI/PUB/1641 • €20.00**

### 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).

**(Forthcoming 2017) • ISBN 978-92-0-103116-7 • STI/PUB/1745 • €44.00**

### Safety of Nuclear Fuel Reprocessing Facilities

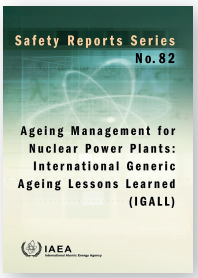
***Specific Safety Guide***

**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.

**(Forthcoming 2016) • ISBN 978-92-0-103016-0 • STI/PUB/1744 • €51.00**

## NUCLEAR POWER PLANTS




### Ageing Management for Nuclear Power Plants: International Generic Ageing Lessons Learned (IGALL)

**Safety Reports Series No. 82**

This publication provides a common internationally agreed basis on what constitutes an acceptable ageing management programme, as well as a knowledge base on ageing management for the design of new plants and design and safety reviews, and aims to serve as a roadmap to available information on ageing management. It addresses ageing management of passive and active structures and components for water moderated reactors that can have an impact, directly or indirectly, on the safe operation of the plant and that are susceptible to ageing degradation. The information provided is relevant for plants under normal operation, for plants considering long term operation, as well as for new plants including new designs. It underlines that ageing management should be implemented from the start of operation of nuclear power plants and that adequate provisions to facilitate effective ageing management should be made during the plant design, construction, commissioning, operation, and decommissioning.

**(87 pp.; 2015) • ISBN 978-92-0-110214-0 • STI/PUB/1675 • €38.00**

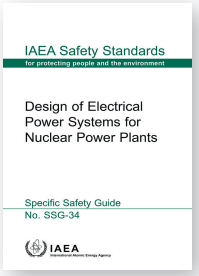
### Basic Safety Principles for Nuclear Power Plants 75-INSAG-3 Rev. 1

***A Report by the International Nuclear Safety Group***

**INSAG Series No. 12**

The present report is a revision of Safety Series No. 75-INSAG-3 (1988), updating the statements made on the objectives and principles of safe design and operation for electricity generating nuclear power plants. It includes the improvements made in the safety of operating nuclear power plants and identifies the principles underlying the best current safety policies to be applied in future plants. It presents INSAG's understanding of the principles underlying the best current safety policies and practices of the nuclear power industry.

**English Edition (97 pp., 4 figs; 1999) • ISBN 92-0-102699-4 • STI/PUB/1082 • €25.50**
**Russian Edition (125 pp., 4 figs; 2015) • ISBN 978-92-0-401315-3 • STI/PUB/1082 • €25.50**



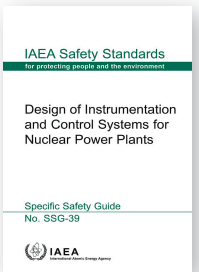

### Design of Electrical Power Systems for Nuclear Power Plants

***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.

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




### 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 references and takes into account other IAEA Safety Standards and Nuclear Security Series publications that provide guidance relating to I&C design.

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

### Design Provisions for Withstanding Station Blackout at Nuclear Power Plants

**IAEA TECDOC Series No. 1770**

This publication provides information for new plant designs as well as modifications to existing operating nuclear power plants to cope with extended station blackout. It describes a common international technical basis to be considered when establishing

all the criteria for a station blackout event, and outlines critical issues which reflect the lessons learned applicable to electrical systems from the Fukushima Daiichi accident. The publication describes current plant practices and design provisions for withstanding a station blackout event already implemented at some nuclear power plants. It also provides proposals for improvement of existing plant designs to increase the robustness of the electrical power systems for contending with a station blackout event.

**(2015) • ISBN 978-92-0-106415-8 • IAEA-TECDOC-1770 • €18.00**

## Maintaining the Design Integrity of Nuclear Installations throughout their Operating Life

***A Report by the International Nuclear Safety Group***

**INSAG Series No. 19**

This INSAG report discusses the problem of maintaining the integrity of the design of a nuclear power plant over its entire lifetime in order to achieve a continuous high level of safety. The purpose of this report is to identify the issues and some of the principles that should be addressed, discuss some of the solutions to the problem and define the specific responsibilities of designers, operators and regulators.

**English Edition (12 pp., 1 fig.; 2003) • ISBN 92-0-112603-4 • STI/PUB/1178 • €9.00**
**Russian Edition (17 pp., 1 fig.; 2015) • ISBN 978-92-0-404315-0 • STI/PUB/1178 • €9.00**

## Management of Operational Safety in Nuclear Power Plants

***A Report by the International Nuclear Safety Group***

**INSAG Series No. 13**

The present report deals with the framework necessary for safety management in organizations in order to promote safety culture, by systematically addressing the general principles underlying the management of operational safety and by providing guidance on good practices. It also draws on the results of audits and reviews to highlight shortfalls in safety management.

**English Edition (43 pp., 2 figs; 1999) • ISBN 92-0-102899-7 • STI/PUB/1083 • €14.50**
**Russian Edition (56 pp., 2 figs; 2015) • ISBN 978-92-0-401215-6 • STI/PUB/1083 • €14.50**

## Safety Aspects of Nuclear Power Plants in Human Induced External Events: General Considerations

**Safety Reports Series No. 86**

This publication gives the general roadmap on how to perform the design and evaluation of the protection of nuclear power plants against human induced external hazards, consistent with IAEA Safety Standards. The publication concentrates on an overall view of the methodology and on the important considerations for its application to existing and new nuclear power plants. Topics covered include elements of the design/evaluation approach, developed in five phases: event identification; load characterization; design and assessment approaches; plant performance assessment and acceptance criteria; and operator response. The publication provides an approach to the assessment of extreme human induced external events which is fully consistent with the methods used for evaluation of nuclear facilities subjected to extreme natural events, such as earthquakes and floods.

**(Forthcoming 2016) • ISBN 978-92-0-111015-2 • STI/PUB/1721 • €41.00**

## Safety Aspects of Nuclear Power Plants in Human Induced External Events: Margin Assessment

**Safety Reports Series No. 88**

This publication describes the procedures for calculating the margins of nuclear power plants in relation to human induced external hazards. It focuses on plant and systems performance evaluations. A two level approach for margin assessment is provided. The first level consists of a deterministic procedure in which, for each scenario, the existence of at least one undamaged success path to comply with the fundamental safety function is investigated. This procedure can be subsequently extended to calculate probability measures such as conditional core damage probability and the conditional probability of spent fuel damage. In the most elaborated stage, probabilistic safety assessment (PSA) techniques are introduced, giving consideration to the probabilistic aspects of the hazards and of the capacity of structures, systems and components (fragility). Event tree and fault tree models are used to compute PSA metrics, such as core damage frequency, large-early release frequency and frequency of spent fuel damage.

**(Forthcoming 2016) • ISBN 978-92-0-111415-0 • STI/PUB/1723 • €42.00**


## Safety of Nuclear Power Plants: Commissioning and Operation

***Specific Safety Requirements***

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

This publication describes the requirements to be met to ensure the safe operation of nuclear power plants. It takes into account developments in areas such as long term operation of nuclear power plants, plant ageing, periodic safety review, probabilistic safety analysis and risk informed decision making processes. 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 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.

**(47 pp., 2 figs; 2016) • ISBN 978-92-0-109415-5 • STI/PUB/1716 • €48.00**

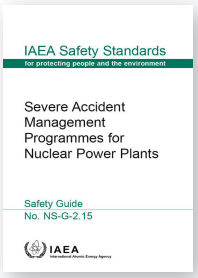

## Safety of Nuclear Power Plants: Design

***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.

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




## 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 (Forthcoming 2016) • ISBN 978-92-0-310115-8 • STI/PUB/1376 • €25.00**

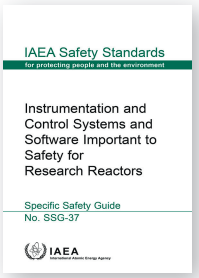
## The Contribution of Palaeoseismology to Seismic Hazard Assessment in Site Evaluation for Nuclear Installations

### IAEA TECDOC Series No. 1767

This publication provides the state of the art and practices of paleoseismology, and supports Member States in the implementation of the provisions of IAEA Safety Standards Series No. SSG-9, Seismic Hazards in Site Evaluation for Nuclear Installations, in establishing the necessary earthquake database required for seismic hazard assessment/reassessment. Paleoseismology is strongly recommended to obtain information on past earthquakes for a sufficient long period and comes under the category of a pre-historical database. Moreover, there is a need to provide detailed guidelines to implement this recommendation in developing the comprehensive database. The publication will also support the needs of Member States to implement the provision of paleoseismology as a post Fukushima action.

**(2015) • ISBN 978-92-0-105415-9 • IAEA-TECDOC-1767 • €18.00**

# RESEARCH REACTORS




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

***Specific Safety Guide***

### IAEA Safety Standards Series No. SSG-37

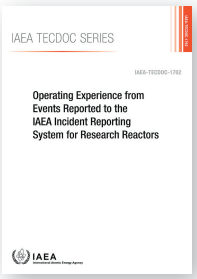
This Safety Guide provides recommendations and guidance on instrumentation and control systems and software important to safety for research reactors, including instrumentation and control system architecture and associated components, from sensors to actuators, operator interfaces and auxiliary equipment. 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.

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

## Nuclear Security Management for Research Reactors and Related Facilities

This publication provides a single source guidance to assist those responsible for the implementation of nuclear security measures at research reactors and associated facilities in developing and maintaining an effective and comprehensive programme covering all aspects of nuclear security on the site. It is based on national experience and practices as well as on publications in the field of nuclear management and security. The scope includes security operations, security processes, and security forces and their relationship with the State's nuclear security regime. The guidance is provided for consideration by States, competent authorities and operators.

**(2016) • ISBN 978-92-0-111315-3 • IAEA-TDL-004 • €18.00**



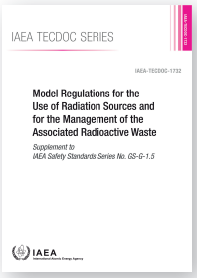

## Operating Experience from Events Reported to the IAEA Incident Reporting System for Research Reactors

### IAEA TECDOC Series No. 1762

This publication provides the operating experience feedback from the events reported to the IAEA's incident reporting system for research reactors since its launch in 1997. The publication has a focus on the root causes, lessons learned, and corrective actions taken to prevent occurrence of similar events. It also analyses the key lessons learned from the recent events in nuclear power plants that are relevant to research reactors. Reference to other publications that cover research reactor events as well as a description of an operating experience programme is included. The publication is intended to be used by research reactor operators, regulators, and designers.

**(2015) • ISBN 978-92-0-100615-8 • IAEA-TECDOC-1762 • €18.00**

# RADIATION SOURCES AND ACCELERATORS



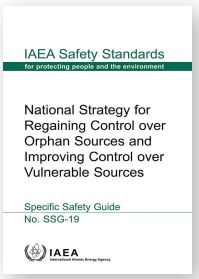

## Model Regulations for the Use of Radiation Sources and for the Management of the Associated Radioactive Waste

### *Supplement to IAEA Safety Standards Series No. GS-G-1.5*

### IAEA TECDOC Series No. 1732

This publication provides advice on an appropriate set of regulations covering all aspects of the use of radiation sources and the safe management of the associated radioactive waste. The publication provides the framework for the regulatory requirements and conditions to be incorporated into individual authorizations for the use of radiation sources in industry, medical facilities, research and education, and in agriculture. It also establishes criteria to be used for assessing compliance. The content allows States to appraise the adequacy of their existing regulations and regulatory guides, and acts as a reference for those States developing regulations for the first time. The publication is a supplement to the guidance in the IAEA Safety Guide GS-G-1.5, Regulatory Control of Radiation Sources.

**Arabic Edition (2015) • ISBN 978-92-0-603516-0 • IAEA-TECDOC-1732 • €18.00**
**English Edition (2013) • ISBN 978-92-0-115613-6 • IAEA-TECDOC-1732 • €18.00**
**Spanish Edition (2015) • ISBN 978-92-0-300915-7 • IAEA-TECDOC-1732 • €18.00**



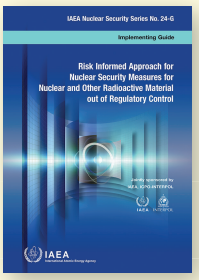

## National Strategy for Regaining Control over Orphan Sources and Improving Control over Vulnerable Sources

### *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**

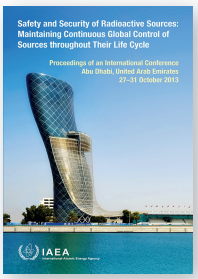



## Risk Informed Approach for Nuclear Security Measures for Nuclear and Other Radioactive Material out of Regulatory Control

### IAEA Nuclear Security Series No. 24-G

This publication provides guidance to States for developing a risk informed approach and for conducting threat and risk assessments as the basis for the design and implementation of sustainable nuclear security systems and measures for prevention of, detection of, and response to criminal and intentional unauthorised acts involving nuclear and other radioactive material out of regulatory control. It describes concepts and methodologies for a risk informed approach, including identification and assessment of threats, targets, and potential consequences; threat and risk assessment methodologies; and the use of risk informed approaches as the basis for informing the development and implementation of nuclear security systems and measures. The publication is an Implementing Guide within the IAEA Nuclear Security Series and is intended for use by national policy makers, law enforcement agencies and experts from competent authorities and other relevant organizations involved in the establishment, implementation, maintenance or sustainability of nuclear security systems and measures related to nuclear and other radioactive material out of regulatory control.

**(69 pp., 11 figs; 2015) • ISBN 978-92-0-100315-7 • STI/PUB/1678 • €41.00**




## Safety and Security of Radioactive Sources: Maintaining Continuous Global Control of Sources throughout Their Life Cycle

***Proceedings of an International Conference Held in Abu Dhabi, United Arab Emirates, 27–31 October 2013***

**Proceedings Series**

The IAEA works with its Member States to help them ensure the safety and security of radioactive sources. The purpose of this conference was to review current success and challenges in ensuring the safety and security of radioactive sources and to identify means to maintain the highest level of safety and security throughout their life cycle, from manufacture to disposal. These proceedings contain the opening addresses, the invited and contributed papers presented during the sessions, and summaries of the discussions. The accompanying CD-ROM contains the presentations of most of the papers presented orally, as well as the complete text of the printed volume. The CD-ROM also contains the national reports on implementation of the Code of Conduct submitted to the conference by States, as per the formalized process established in 2006.

**(783 pp., 134 figs; 2015) • ISBN 978-92-0-105214-8 • STI/PUB/1667 • €90.00**

## The Safe Management of Sources of Radiation: Principles and Strategies

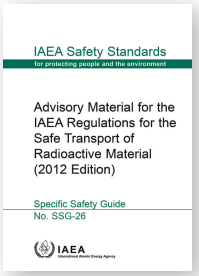
***A Report by the International Nuclear Safety Group***

**INSAG Series No. 11**

This INSAG report deals with the general principles governing the safety of all sources of radiation and with the application of these principles. It seeks to demonstrate that, at the conceptual level, the distinction traditionally made between nuclear safety and radiation protection is not justified. This report is primarily intended for the non-specialist who needs to take decisions about the safe management of sources of radiation and who wishes to gain a better understanding of the approach followed in managing the safety of these sources.

**English Edition (27 pp.; 1999) • ISBN 92-0-102199-2 • STI/PUB/1080 • €11.00**
**Russian Edition (35 pp.; 2015) • ISBN 978-92-0-408415-3 • STI/PUB/1080 • €11.00**

# TRANSPORT OF RADIOACTIVE MATERIAL




## 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 (Forthcoming 2016) • ISBN 978-92-0-300116-8 • STI/PUB/1586 • €70.00**

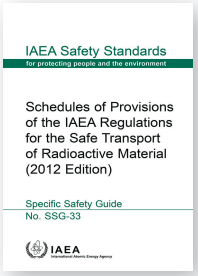
## Application of the Revised Provisions for Transport of Fissile Material in the IAEA Regulations for the Safe Transport of Radioactive Material

***2012 Edition***

**IAEA TECDOC Series No. 1768**

The IAEA Regulations for Safe Transport of Radioactive Material have been in place since 1961 and have been periodically reviewed by Member State experts and revised by the IAEA as needed to address safety concerns. The regulations have historically provided requirements for package design, package performance, and operations based, in part, on the type of radioactive material that would be included in the package. Since their introduction the regulations have included criteria to permit the transport of fissile material in packages not requiring competent authority approval of the design for the transport of fissile material. This publication provides the background and overview to the revised requirements, and provides practical advice regarding the use of these revised provisions.

**(2015) • ISBN 978-92-0-106215-4 • IAEA-TECDOC-1768 • €18.00**



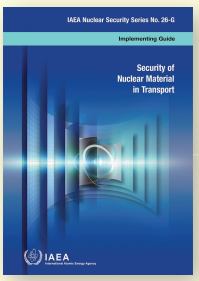

## Schedules of Provisions of the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition)

***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.

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

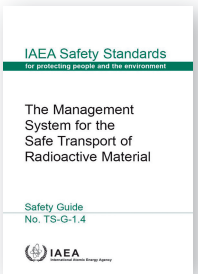



## Security of Nuclear Material in Transport

**IAEA Nuclear Security Series No. 26-G**

This publication provides guidance to States and their competent authorities on how to implement and maintain a physical protection regime for transport of nuclear material. It will also be useful to shippers or carriers in the design and implementation of their physical protection systems. The publication builds upon the Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), IAEA Nuclear Security Series No. 13, and provides additional guidance on how to implement these recommendations in practice.

**(104 pp., 2 figs; 2015) • ISBN 978-92-0-102015-4 • STI/PUB/1686 • €48.00**




## The Management System for the Safe Transport of Radioactive Material

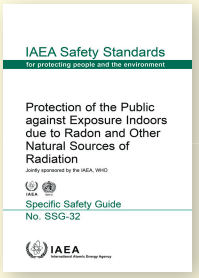
***Safety Guide***

**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 (Forthcoming 2016) • ISBN 978-92-0-300916-4 • STI/PUB/1352 • €32.00**

# RADIATION PROTECTION



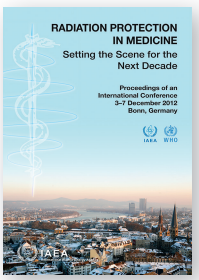

## Protection of the Public against Exposure Indoors due to Radon and Other Natural Sources of Radiation

***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.

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



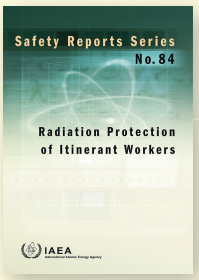

## Radiation Protection in Medicine: Setting the Scene for the Next Decade

***Proceedings of an International Conference Held in Bonn, Germany, 3–7 December 2012***

**Proceedings Series**

Presenting the proceedings of the International Conference on Radiation Protection in Medicine: Setting the Scene for the Next Decade, the publication aims to indicate gaps in current approaches to radiation protection in medicine; identify tools for improving radiation protection in medicine; review advances, challenges and opportunities in the field; and assess the impact of the international action plan for the radiation protection of patients, in order to prepare new international recommendations. The Conference drew up the 10-point Bonn Call for Action, which identifies responsibilities of and proposes priorities for stakeholders regarding radiation protection in medicine for the next decade.

**(429 pp., 26 figs; 2015) • ISBN 978-92-0-103914-9 • STI/PUB/1663 • €130.00**

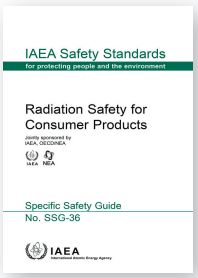



## Radiation Protection of Itinerant Workers

### Safety Reports Series No. 84

This publication addresses the protection and safety issues associated with the use of itinerant workers. Such workers are defined for this report as occupationally exposed workers, who work in supervised and/or controlled areas at one or more locations and are not employees of the management of the facility where they are working. It focuses on the necessary communication and cooperation to establish a clear allocation of responsibilities among the relevant parties, including the itinerant worker, the employer of that worker and the management of the facility at which the work is occurring. Managerial and practical arrangements are described, to ensure the protection and safety of itinerant workers. Discussion topics include dose tracking and control, training, safety culture development and application of the requirements for protection and safety coherently with other requirements.

**(144 pp., 1 fig.; 2015) • ISBN 978-92-0-102215-8 • STI/PUB/1688 • €41.00**




## Radiation Safety for Consumer Products

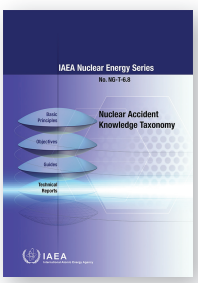
### *Specific Safety Guide*

### 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.

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

# ACCIDENT RESPONSE

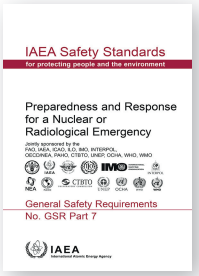



## Nuclear Accident Knowledge Taxonomy

### IAEA Nuclear Energy Series No. NG-T-6.8

There is a need to categorize and structure knowledge related to nuclear accidents. Development of the structure is challenging unless conducted with consideration of the experience of people who were involved in the accidents. In order to support those activities, the IAEA has taken a leading role to assist in the development of a knowledge organization system and associated taxonomy for nuclear accident knowledge domain, which could be implemented and applied by Member States' nuclear organizations. This publication is intended to support Member State activity in managing knowledge from serious nuclear accidents, providing a description of knowledge organization system features, information about the developed system taxonomy, and details on the methodology to organize knowledge in this area.

**(37 pp., 5 figs; 2016) • ISBN 978-92-0-101416-0 • STI/PUB/1730 • €28.00**




## 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.

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


## The Fukushima Daiichi Accident

The Fukushima Daiichi Accident consists of a Report by the IAEA Director General and five technical volumes. It is the result of an extensive international collaborative effort involving five working groups with about 180 experts from 42 Member States with and without nuclear power programmes and several international bodies. It provides a description of the accident and its causes, evolution and consequences, based on the evaluation of data and information from a large number of sources available at the time of writing.

The Fukushima Daiichi Accident will be of use to national authorities, international organizations, nuclear regulatory bodies, nuclear power plant operating organizations, designers

of nuclear facilities and other experts in matters relating to nuclear power, as well as the wider public.

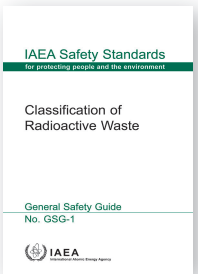
The set contains six printed parts and five supplementary CD-ROMs.

Contents:

Report by the Director General; Technical Volume 1/5, Description and Context of the Accident; Technical Volume 2/5, Safety Assessment; Technical Volume 3/5, Emergency Preparedness and Response; Technical Volume 4/5, Radiological Consequences; Technical Volume 5/5, Post-accident Recovery; Annexes.

**(1254 pp., 311 figs; 2015) • ISBN 978-92-0-107015-9 • STI/PUB/1710 • €60.00**

# RADIOACTIVE WASTE MANAGEMENT



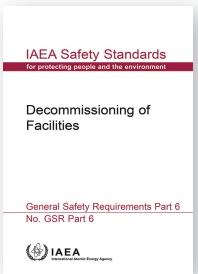

## Classification of Radioactive Waste

***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**




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

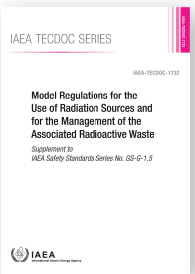
## Methodology for Safety Assessment Applied to Predisposal Waste Management

***Report of the Results of the International Project on Safety Assessment Driving Radioactive Waste Management Solutions (SADRWMS) (2004–2010)***

**IAEA TECDOC Series No. 1777**

The IAEA's programme on Safety Assessment Driving Radioactive Waste Management Solutions (SADRWMS) focused on approaches and mechanisms for application of safety assessment methodologies for the predisposal management of radioactive waste. The initial outcome of the SADRWMS Project was achieved through the development of flowcharts, which have since been incorporated into IAEA Safety Standards Series No. GSG-3, Safety Case and Safety Assessment for Predisposal Management of Radioactive Waste. In 2005, an initial specification was developed for the Safety Assessment Framework (SAFRAN) software tool to apply the SADRWMS flowcharts. In 2008, an in-depth application of the SAFRAN tool and the SADRWMS methodology was carried out on the predisposal management facilities of the Thailand Institute of Nuclear Technology Radioactive Waste Management Centre (TINT Facility). This publication summarizes the content and outcomes of the SADRWMS programme. The Chairman's Report of the SADRWMS Project and the Report of the TINT test case are provided on the CD-ROM which accompanies this report.

**(2015) • ISBN 978-92-0-109215-1 • IAEA-TECDOC-1777 • €18.00**




## Model Regulations for the Use of Radiation Sources and for the Management of the Associated Radioactive Waste

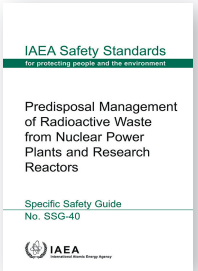
***Supplement to IAEA Safety Standards Series No. GS-G-1.5***

**IAEA TECDOC Series No. 1732**

This publication provides advice on an appropriate set of regulations covering all aspects of the use of radiation sources and the safe management of the associated radioactive waste. The publication provides the framework for the regulatory requirements and conditions to be incorporated into individual authorizations for the use of radiation sources in industry, medical facilities, research and education, and in agriculture. It also establishes criteria to be used for assessing compliance. The content allows States to appraise the adequacy of their existing regulations and regulatory guides, and acts as

a reference for those States developing regulations for the first time. The publication is a supplement to the guidance in the IAEA Safety Guide GS-G-1.5, Regulatory Control of Radiation Sources.

**Arabic Edition (2015) • ISBN 978-92-0-603516-0 • IAEA-TECDOC-1732 • €18.00**
**English Edition (2013) • ISBN 978-92-0-115613-6 • IAEA-TECDOC-1732 • €18.00**
**Spanish Edition (2015) • ISBN 978-92-0-300915-7 • IAEA-TECDOC-1732 • €18.00**



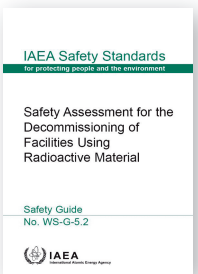

## Predisposal Management of Radioactive Waste from Nuclear Power Plants and Research Reactors

***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.

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



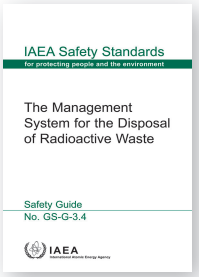

## Safety Assessment for the Decommissioning of Facilities Using Radioactive Material

***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**



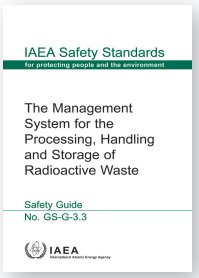

## The Management System for the Disposal of Radioactive Waste

***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**




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

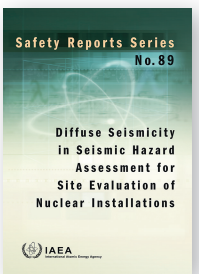
***Safety Guide***

### 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**

# SAFETY ANALYSIS



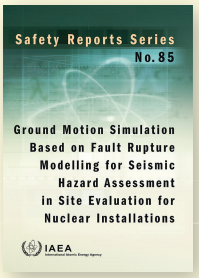

## Diffuse Seismicity in Seismic Hazard Assessment for Site Evaluation of Nuclear Installations

### Safety Reports Series No. 89

Diffuse seismicity refers to earthquakes occurring in locations where no apparent correlation can be made with any causative faults. The possibility of such earthquakes must be taken into consideration for nuclear installation sites, even for low to moderate seismicity regions, and their potential influence has to be assessed appropriately. This publication provides guidance for addressing the seismic hazard from diffuse seismicity in a

manner consistent with internationally recognized practices and with reference to relevant IAEA Safety Standards.

**(88 pp., 26 figs; 2016) • ISBN 978-92-0-101716-1 • STI/PUB/1727 • €55.00**

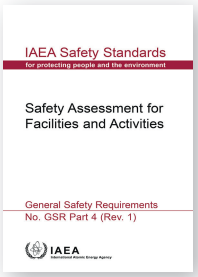



### Ground Motion Simulation Based on Fault Rupture Modelling for Seismic Hazard Assessment in Site Evaluation for Nuclear Installations

**Safety Reports Series No. 85**

Explaining the principles that underlie strong ground motion simulation, this publication describes various methods for simulating strong ground motions, and presents some examples of strong ground motion simulations using fault rupture modelling. The detailed guidelines and practical tools presented in this Safety Report will be of value to researchers, operating organizations, regulatory bodies, vendors and technical support organizations in the areas of seismic hazard evaluation of nuclear installations. The information provided will also be of great importance for seismic hazard assessments following the Fukushima Daiichi nuclear power plant accident.

**(126 pp., 54 figs; 2015) • ISBN 978-92-0-102315-5 • STI/PUB/1689 • €59.00**




### 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.

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

### Safety Reassessment for Nuclear Fuel Cycle Facilities in Light of the Accident at the Fukushima Daiichi Nuclear Power Plant

**Safety Reports Series No. 90**

This publication provides guidance on performing safety reassessments, in the light of the accident at the Fukushima Daiichi nuclear power plant and in accordance with a graded approach, for nuclear fuel cycle facilities of all types. Although this publication primarily focuses on nuclear fuel cycle facilities that are in operation, the guidance it provides also applies to facilities that are in the design and construction phases. It is not intended to replace or supersede any of the requirements or guidance provided by the relevant IAEA Safety Standards, including those covering safety analysis, evaluation of seismic and external hazards, and emergency preparedness and response for nuclear fuel cycle facilities. However, this publication should be used in close conjunction with these Safety Standards.

**(Forthcoming 2016) • ISBN 978-92-0-101916-5 • STI/PUB/1726 • €40.00**

## QUALITY MANAGEMENT

### Key Practical Issues in Strengthening Safety Culture

***A Report by the International Nuclear Safety Group***

**INSAG Series No. 15**

This report discusses key issues in safety culture and practical matters such as the assessment of personal contributions to the enhancement of safety culture. It complements Safety Series No. 75-INSAG-4, Safety Culture (1991) and INSAG Series No. 13, Management of Operational Safety in Nuclear Power Plants.

**English Edition (25 pp., 1 fig.; 2002) • ISBN 92-0-112202-0 • STI/PUB/1137 • €12.50**
**Russian Edition (31 pp., 1 fig.; 2015) • ISBN 978-92-0-401015-2 • STI/PUB/1137 • €12.50**

### Maintaining Knowledge, Training and Infrastructure for Research and Development in Nuclear Safety

***A Report by the International Nuclear Safety Group***

**INSAG Series No. 16**

This INSAG report, which was previously issued as INSAG Note No. 4, discusses the role that safety research has played, the present declining trend and the circumstances that are critical in maintaining a research infrastructure. The report describes new and emerging challenges that necessitate continued support of research and education opportunities and provides recommendations on how sufficient research capacity and competence can be maintained. The report is written for decision makers in government, industry and international organizations who have responsibility for research activities and educational facilities.

**English Edition (13 pp.; 2003) • ISBN 92-0-113203-4 • STI/PUB/1179 • €9.00**
**Russian Edition (15 pp.; 2015) • ISBN 978-92-0-406615-9 • STI/PUB/1179 • €9.00**

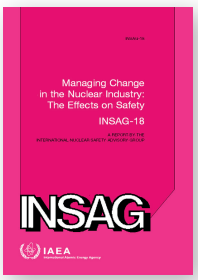
## Maintaining the Design Integrity of Nuclear Installations throughout their Operating Life

***A Report by the International Nuclear Safety Group***

**INSAG Series No. 19**

This INSAG report discusses the problem of maintaining the integrity of the design of a nuclear power plant over its entire lifetime in order to achieve a continuous high level of safety. The purpose of this report is to identify the issues and some of the principles that should be addressed, discuss some of the solutions to the problem and define the specific responsibilities of designers, operators and regulators.

**English Edition (12 pp., 1 fig.; 2003) • ISBN 92-0-112603-4 • STI/PUB/1178 • €9.00**
**Russian Edition (17 pp., 1 fig.; 2015) • ISBN 978-92-0-404315-0 • STI/PUB/1178 • €9.00**



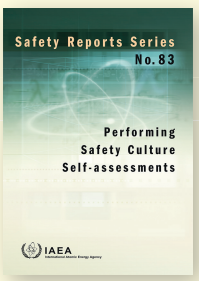

## Managing Change in the Nuclear Industry: The Effects on Safety

***A Report by the International Nuclear Safety Group***

**INSAG Series No. 18**

This INSAG report is written for members of boards of directors and senior executives who are responsible for the overall safety of an installation, who make decisions for change, and who implement those decisions. It is also written for senior regulators who, on behalf of the public, ensure that boards of directors and executives meet their responsibilities for safety. The report discusses how and why change can challenge the maintenance of a high level of safety, and what can be done to control that challenge and hence reap all the benefits of change. It draws an analogy between the well-established principles for managing engineering changes safely and the need to put in place similar approaches to manage organizational changes. The report also identifies issues that regulators should review when licensees propose changes to the organization and management of their enterprise.

**English Edition (12 pp.; 2003) • ISBN 92-0-113403-7 • STI/PUB/1173 • €9.00**
**Russian Edition (15 pp.; 2015) • ISBN 978-92-0-408015-5 • STI/PUB/1173 • €9.00**

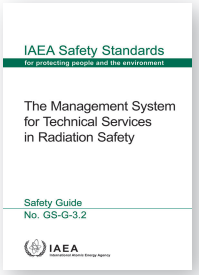



## Performing Safety Culture Self-assessments

**Safety Reports Series No. 83**

This publication provides practical guidance on how to conduct a safety culture self-assessment. The focus is on using such assessments as a learning opportunity for organizational growth and development rather than as a fault-finding or 'find and fix' exercise. The approach involves considerable engagement with all levels of the organization. Methods applied include document reviews, questionnaires, interviews, observations and focus groups. Besides the complexity and subtleties of safety culture it also describes how to avoid common pitfalls in analysing results. The information presented in this publication will be of interest to individuals engaged in assessing and improving safety culture.

**(157 pp., 11 figs; 2016) • ISBN 978-92-0-101515-0 • STI/PUB/1682 • €63.00**



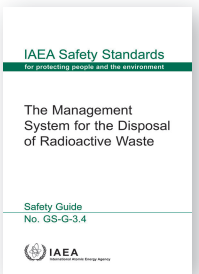

## The Management System for Technical Services in Radiation Safety

***Safety Guide***

**IAEA Safety Standards Series No. GS-G-3.2**

Implementing a management system into a service provider organization is an important task to promote the quality of the service. Many Member States currently require management systems in their procedure of service authorization. This publication will be of use to consulting or measurement organizations when creating and implementing management systems that will help them to obtain authorization for their activities. The publication describes clearly the different requirements for consulting organizations that do and do not perform measurements. The difference between third party assessment requirements (often also used in Member States to speed up the authorization process) for certification and accreditation is explained in detail. The text is supplemented with informative examples covering tasks within the management system.

**English Edition (51 pp., 1 fig.; 2008) • ISBN 978-92-0-100308-9 • STI/PUB/1319 • €25.00**
**French Edition (53 pp., 1 fig.; 2009) • ISBN 978-92-0-211808-9 • STI/PUB/1319 • €25.00**
**Russian Edition (60 pp., 1 fig.; 2015) • ISBN 978-92-0-406115-4 • STI/PUB/1319 • €25.00**



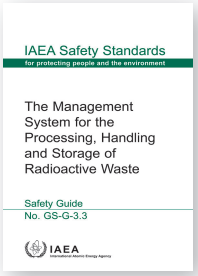

## The Management System for the Disposal of Radioactive Waste

***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**




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

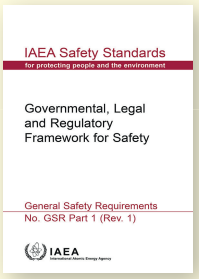
***Safety Guide***

**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**

## LEGAL AND GOVERNMENTAL ASPECTS




### 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.

**(42 pp., 2 figs; 2016) • ISBN 978-92-0-108815-4 • STI/PUB/1713 • €48.00**

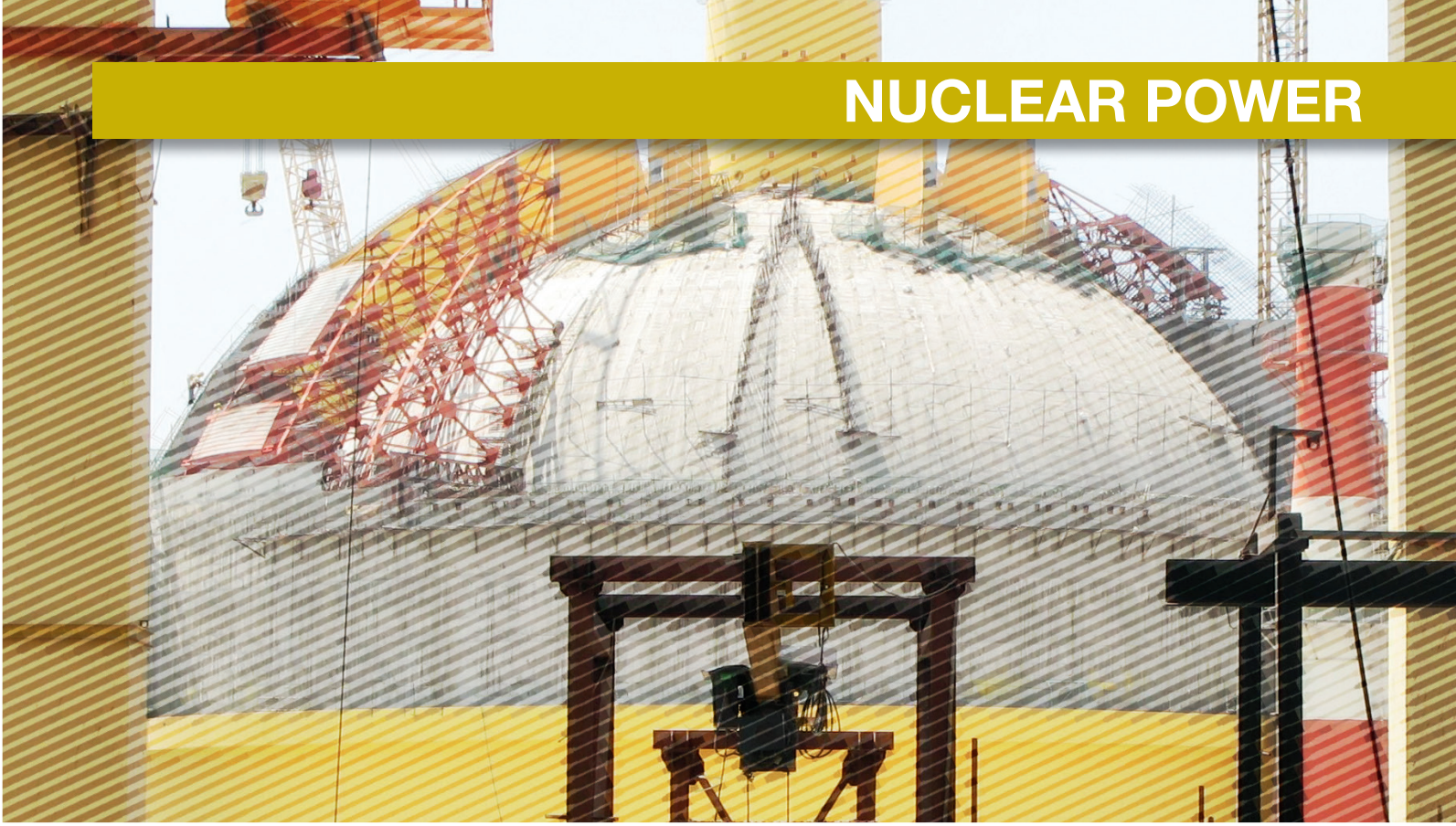
### Managing Change in the Nuclear Industry: The Effects on Safety

***A Report by the International Nuclear Safety Group***

**INSAG Series No. 18**

This INSAG report is written for members of boards of directors and senior executives who are responsible for the overall safety of an installation, who make decisions for change, and who implement those decisions. It is also written for senior regulators who, on behalf of the public, ensure that boards of directors and executives meet their responsibilities for safety. The report discusses how and why change can challenge the maintenance of a high level of safety, and what can be done to control that challenge and hence reap all the benefits of change. It draws an analogy between the well-established principles for managing engineering changes safely and the need to put in place similar approaches to manage organizational changes. The report also identifies issues that regulators should review when licensees propose changes to the organization and management of their enterprise.

**English Edition (12 pp.; 2003) • ISBN 92-0-113403-7 • STI/PUB/1173 • €9.00**
**Russian Edition (15 pp.; 2015) • ISBN 978-92-0-408015-5 • STI/PUB/1173 • €9.00**



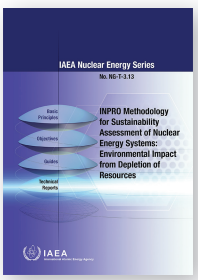
# NUCLEAR POWER

## Country Nuclear Power Profiles

***2015 Edition***

The Country Nuclear Power Profiles compile background information on the status and development of nuclear power programmes in Member States. The publication summarizes organizational and industrial aspects of nuclear power programmes and provides information about the relevant legislative, regulatory and international framework in each State. Its descriptive and statistical overview of the overall economic, energy and electricity situation in each State and its nuclear power framework is intended to serve as an integrated source of key background information about nuclear power programmes throughout the world. This 2015 edition, issued on CD-ROM, contains updated country information for 51 States.

**(2015) • ISBN 978-92-0-158515-8 • IAEA-CNPP/2015/CD • €95.00**




## INPRO Methodology for Sustainability Assessment of Nuclear Energy Systems: Environmental Impact from Depletion of Resources

### IAEA Nuclear Energy Series No. NG-T-3.13

INPRO is an international project to help ensure that nuclear energy is available to contribute in a sustainable manner to meeting the energy needs of the 21st century. A basic principle of INPRO in the area of environmental impact from depletion of resources is that a nuclear energy system will be capable of contributing to the energy needs in the 21st century while making efficient use of non-renewable resources needed for construction, operation and decommissioning. Recognizing that a national nuclear energy programme in a given country may be based both on indigenous resources and resources purchased from abroad, this publication provides background materials and summarizes the results of international global resource availability studies that could contribute to the corresponding national assessments.

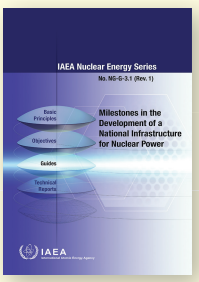
**(62 pp., 25 figs; 2015) • ISBN 978-92-0-103415-1 • STI/PUB/1700 • €33.00**

## Integrated Nuclear Infrastructure Review (INIR) Missions: The First Six Years

### IAEA TECDOC Series No. 1779

The IAEA integrated nuclear infrastructure review (INIR) missions are designed to assist Member States in evaluating the status of their national infrastructure for the introduction of a nuclear power programme. From 2009 to 2014, fourteen IAEA INIR missions and follow-up activities were conducted in nine countries planning to implement a nuclear power programme and one country expanding an existing programme. During this time considerable experience was gained and this has been used to continuously improve the overall INIR methodology. This publication summarizes the results of the missions and highlights the most significant areas where recommendations were made.

**(2015) • ISBN 978-92-0-110615-5 • IAEA-TECDOC-1779 • €18.00**



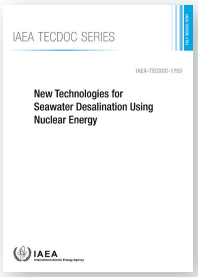

## Milestones in the Development of a National Infrastructure for Nuclear Power

### IAEA Nuclear Energy Series No. NG-G-3.1 (Rev. 1)

The development and implementation of an appropriate infrastructure to support the successful introduction of nuclear power and its safe, secure, peaceful and sustainable application

is an issue of central concern, especially for countries that are considering and planning their first nuclear power plant. In preparing the necessary nuclear infrastructure, there are several activities that need to be completed. These activities can be split into three progressive phases of development. This publication provides a description of the conditions expected to be achieved by the end of each phase to assist with the best use of resources. 'Milestones' refer to the conditions necessary to demonstrate that the phase has been successfully completed.

**(79 pp., 1 fig.; 2015) • ISBN 978-92-0-104715-1 • STI/PUB/1704 • €40.00**




### New Technologies for Seawater Desalination Using Nuclear Energy

**IAEA TECDOC Series No. 1753**

This publication compiles the findings of research and development activities relating to new technologies to support seawater desalination using nuclear energy. An overview of current progress on low temperature technologies for seawater desalination is included. The publication also provides information on competitiveness and sustainability of seawater desalination using nuclear energy and a techno-economic feasibility study of nuclear desalination.

**(2015) • ISBN 978-92-0-100115-3 • IAEA-TECDOC-1753 • €18.00**

### Nuclear Power Reactors in the World

***2016 Edition***

**Reference Data Series No. 2**

This is the 36th edition of Reference Data Series No. 2, which presents the most recent reactor data available to the IAEA. It contains summarized information as of the end of 2015 on power reactors operating, under construction and shut down as well as performance data on reactors operating in the IAEA Member States. The information is collected through designated national correspondents in the Member States and the data are used to maintain the IAEA's Power Reactor Information System (PRIS).

**(79 pp., 6 figs; 2016) • ISBN 978-92-0-103716-9 • IAEA-RDS-2/36 €15.00**

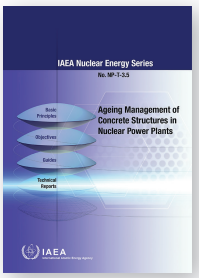
### Opportunities for Cogeneration with Nuclear Energy

**IAEA Nuclear Energy Series No. NP-T-4.1**

This publication presents a comprehensive overview of various aspects relating to the application of cogeneration with nuclear energy, which may offer advantages such as increased efficiency, better cost effectiveness, and reduced environmental impact. The publication provides details on experiences, best practices and expectations for the foreseeable future of cogeneration with nuclear power technology and serves as a guide that supports newcomer countries. It includes information on systems and applications in various sectors, feasibility aspects, technical and economic details, and case studies.

**(Forthcoming 2016) • ISBN 978-92-0-103616-2 • STI/PUB/1749 • €58.00**

## NUCLEAR POWER PLANNING AND ECONOMICS

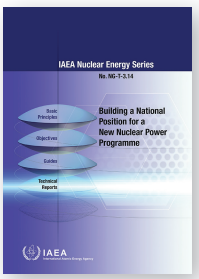



### Ageing Management of Concrete Structures in Nuclear Power Plants

**IAEA Nuclear Energy Series No. NP-T-3.5**

This publication is one in a series of reports on the assessment and management of ageing of major nuclear power plant (NPP) components. Current practices for assessment of safety margins (fitness for service) and inspection, monitoring and mitigation of ageing related degradation of selected concrete structures related to NPPs are documented. Implications for and differences in new reactor designs are discussed. This information is intended to help all involved directly and indirectly in ensuring the safe operation of NPPs, and also to provide a common technical basis for dialogue between plant operators and regulators when dealing with age related licensing issues.

**(355 pp., 211 figs; 2016) • ISBN 978-92-0-102914-0 • STI/PUB/1654 • €55.00**




### Building a National Position for a New Nuclear Power Programme

**IAEA Nuclear Energy Series No. NG-T-3.14**

This publication provides guidance to countries seeking to establish a national position on the introduction or re-establishment of a nuclear power programme. It provides direction to political decision makers, energy experts, and other stakeholders about the process for establishing a national position as countries prepare national nuclear energy policies. It also helps embarking countries to build a consistent and durable national position for nuclear power on the basis of sound energy planning and greater public involvement in order to maintain the country's long term commitment, regardless of possible political changes in a country.

**(19 pp., 2 figs; 2016) • ISBN 978-92-0-102216-5 • STI/PUB/1736 • €20.00**

### Commissioning Guidelines for Nuclear Power Plants

**IAEA Nuclear Energy Series No. NP-T-2.10**

Commissioning is one of the key steps towards putting into service a new nuclear facility, or a new system, structure or component within an existing facility. Commissioning activities need to be planned early in the design and procurement process, with careful consideration of eventual acceptance criteria and test methods. This publication describes commissioning in its basic form, the commissioning process specific to nuclear power plants (NPPs), the relevant management system requirements, typical organizational models and critical human resources issues. It also provides details on experience and lessons

learned obtained in IAEA Member States. The publication will be of use to all stakeholders involved in the commissioning of NPPs, including owner operators, contractors, engineers, regulatory bodies and vendors.

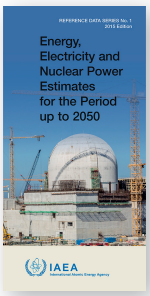
**(Forthcoming 2016) • ISBN 978-92-0-102816-7 • STI/PUB/1742 • €48.00**

## Developing Industrial Involvement to Support a National Nuclear Power Programme

### IAEA Nuclear Energy Series No. NG-T-3.4

This publication, an update of Technical Reports Series No. 281, provides guidance in making the many considerations and decisions involved in preparing national industrial organizations for participation in a nuclear power programme, including those that will participate in the construction and commissioning of the first nuclear power plant units. Roles and responsibilities of government, industry, utility and other stakeholders are detailed.

**(Forthcoming 2016) • ISBN 978-92-0-103715-2 • STI/PUB/1703 • €36.00**




## Energy, Electricity and Nuclear Power Estimates for the Period up to 2050

***2015 Edition***

### Reference Data Series No. 1

The 35th edition of the annual Reference Data Series No. 1 contains estimates of energy, electricity and nuclear power trends up to the year 2050, using a variety of sources, such as the IAEA's Power Reactor Information System and data prepared by the United Nations.

**(53 pp., 10 figs; 2015) • ISBN 978-92-0-105915-4 • IAEA-RDS-1/35 • €18.00**

## Evaluation of the Status of National Nuclear Infrastructure Development (Rev. 1)

### IAEA Nuclear Energy Series No. NG-T-3.2

This publication provides a holistic approach to evaluate progress in the development of the nuclear power infrastructure based on the guidance contained in the IAEA Nuclear Energy Series No. NG-G-3.1, Milestones in the Development of a National Infrastructure for Nuclear Power. It can be used by a Member State itself, wishing to evaluate its progress (self-evaluation), or as a basis for an integrated nuclear infrastructure review (INIR) mission. This revised version combines in one document an explanation of the methodology and the evaluation tables, takes into account all new material and lessons learned from the Fukushima Daiichi accident, and presents the results of the INIR missions implemented between 2009 and 2014.

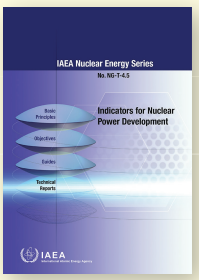
**(Forthcoming 2016) • ISBN 978-92-0-102316-2 • STI/PUB/1737 • €29.00**

## Handbook of Ageing Management for Nuclear Power Plants

### IAEA Nuclear Energy Series No. NP-T-3.24

This handbook on ageing management for nuclear power plants (NPPs) has been developed in compliance with relevant IAEA Safety Standards and draws on lessons learned from ageing management practices worldwide. It provides an overview of the topic and guidance on proactive ageing management within NPPs. The publication also collates information on ageing mechanisms, effects on structures, systems and components, the regulatory framework as well as some details on innovative techniques and research and development in the area. The information is presented concisely with clear flow charts and with structured reference to the underlying principles. The handbook will support NPP staff, maintenance managers, vendors, personnel at research organizations and regulators in their work related to the ageing of structures, systems and components.

**(Forthcoming 2016) • ISBN 978-92-0-102416-9 • STI/PUB/1738 • €48.00**




## Indicators for Nuclear Power Development

### IAEA Nuclear Energy Series No. NG-T-4.5

Considering the scale of nuclear power aspirations, the number of planned nuclear new builds and the prospects of a number of countries constructing their first nuclear power plants, there is a need to assess the broader context of nuclear energy programmes in areas of macro-and socioeconomic conditions, energy systems and nuclear power, and the environment. It is important to assess the degree to which introduction or expansion of nuclear power is beneficial under these specific circumstances. This publication provides a set of indicators for nuclear power development that can serve as a tool to help explore these issues. The indicators are meant to provide a first order assessment of the situation and identify the issues that present the benefits and challenges in a balanced and objective manner and thereby help guide more detailed evaluations in the next stage of planning and preparations. Methodology sheets are provided to help users in data collection, quantification and interpretation of the indicators. The application of the indicators set is flexible. Users can select a subset of indicators that are most relevant for the questions they wish to explore in a given study or decision making process.

**(93 pp., 4 figs; 2015) • ISBN 978-92-0-107115-6 • STI/PUB/1712 • €37.00**

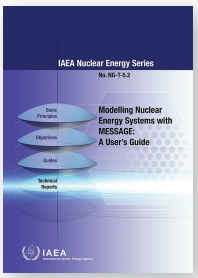
## INPRO Methodology for Sustainability Assessment of Nuclear Energy Systems: Environmental Impact of Stressors

### IAEA Nuclear Energy Series No. NG-T-3.15

This publication provides guidance on assessing of sustainability of a nuclear energy system (NES) in the area of environmental impact of stressors. The INPRO methodology is a comprehensive tool for the assessment of sustainability

of an NES. Basic principles, user requirements and criteria have been defined in different areas of INPRO methodology. These include economics, infrastructure, waste management, proliferation resistance, environmental impact of stressors, environmental impact from depletion of resources, and safety of nuclear reactors and fuel cycle facilities. The ultimate goal of the application of the INPRO methodology is to check whether the assessed NES fulfils all the criteria, and hence the user requirements and basic principles, and therefore presents a system for a Member State that is sustainable in the long term.

**(Forthcoming 2016) • ISBN 978-92-0-101616-4 • STI/PUB/1733 • €38.00**




## Modelling Nuclear Energy Systems with MESSAGE: A User's Guide

### IAEA Nuclear Energy Series No. NG-T-5.2

Assessing nuclear energy transition scenarios requires appropriate modelling tools. The IAEA tool, Model for Energy Supply System Alternatives and their General Environmental Impacts (MESSAGE), is described in this publication. The tool simulates the development of a complete energy system and provides a convenient platform for modelling and analysing nuclear energy systems (NESs), as it can efficiently model nuclear technologies with their specific features. Among other things, the tool can help produce a description of an entire NES with time dependent parameters for long-term planning; confirm the feasibility of a NES through correlation and consistency of all NES components, taking into account all constraints and boundary conditions imposed on the system; and balance fissile material in a closed fuel cycle and determine fuel cycle requirements. In addition, it assists the user in the choice of alternatives by comparison of different options relating to fuel requirements and volume and toxicity of waste. The publication provides a detailed guidance on how to build mathematical models representing complex nuclear energy systems within the framework of the MESSAGE tool.

**(126 pp., 110 figs; 2016) • ISBN 978-92-0-109715-6 • STI/PUB/1718 • €39.00**

## Nuclear Power in Countries with Limited Electrical Grid Capacities: The Case of Armenia

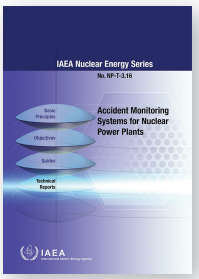
### *A Report of the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO)*

### IAEA TECDOC Series No. 1778

This publication addresses issues relating to nuclear power deployment faced by countries with electrical grids of limited capacity and stability. In particular, technology issues and related institutional measures as well as some technical and economic options for managing spent fuel and radioactive waste applicable in these circumstances are addressed. It aims to assist States implementing a nuclear power programme in the development of a comprehensive approach to the long term management of spent nuclear fuel and radioactive waste that is technically sound, environmentally responsible, economically feasible and acceptable to all stakeholders. Armenia was selected as a case study and the data obtained from the studies performed led to general recommendations which could be applicable to some other countries with similar economies and grid characteristics.

**(2015) • ISBN 978-92-0-110415-1 • IAEA-TECDOC-1778 • €18.00**

# NUCLEAR POWER OPERATIONS

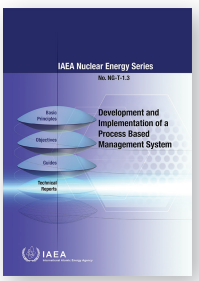



## Accident Monitoring Systems for Nuclear Power Plants

### IAEA Nuclear Energy Series No. NP-T-3.16

In the Fukushima Daiichi accident, the instrumentation provided for accident monitoring proved to be ineffective for a combination of reasons. The accident has therefore highlighted the need to re-examine criteria for accident monitoring instrumentation. This publication covers all relevant aspects of accident monitoring in nuclear power plants (NPPs). The critical issues discussed reflect the lessons learned from the Fukushima Daiichi accident, involve accident management and accident monitoring strategies for NPPs; selection of plant parameters for monitoring plant status; establishment of performance, design, qualification, display, and quality assurance criteria for designated accident monitoring instrumentation; and design and implementation considerations. Technology needs and techniques for accident monitoring instrumentation are also addressed.

**(84 pp., 12 figs; 2015) • ISBN 978-92-0-110414-4 • STI/PUB/1676 • €32.00**

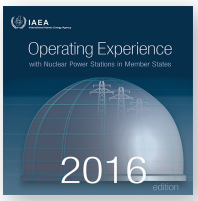



## Development and Implementation of a Process Based Management System

### IAEA Nuclear Energy Series No. NG-T-1.3

The implementation of a process based management system is challenging for many organizations accustomed to traditional, non-integrated, non-process based approaches to management systems. This publication provides practical guidance to nuclear organizations that are planning to implement a management system to comply with IAEA Safety Standards Series No. GS-R-3. It will also be beneficial for newcomer countries, since a vendor-provided "management system" delivered with a nuclear power plant to ensure safe operation is often a quality management system for operations and maintenance, which may integrate aspects related to safety and environmental protection. These quality assurance systems have to undergo a transition to a process based management system to ensure that the processes of the owner/operator will be tailored to achieve the goals and objectives for safe operation.

**(57 pp., 17 figs; 2015) • ISBN 978-92-0-103215-7 • STI/PUB/1698 • €34.00**



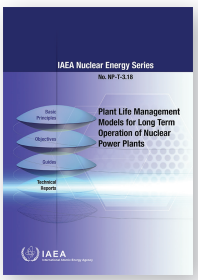

## Operating Experience with Nuclear Power Stations in Member States in 2015

***2016 Edition***

### Operating Experience

This CD-ROM contains the 47th edition of the IAEA's series of annual reports on operating experience with nuclear power plants in Member States. It is a direct output from the IAEA's Power Reactor Information System (PRIS) and contains information on electricity production and overall performance of individual plants during 2015. In addition to annual information, the report contains a historical summary of performance during the lifetime of individual plants and figures illustrating worldwide performance of the nuclear industry. The CD-ROM contains also an overview of design characteristics and dashboards of all operating nuclear power plants worldwide.

**CD Edition (2016) ISBN 978-92-0-155016-3 • STI/PUB/1752 €75.00**

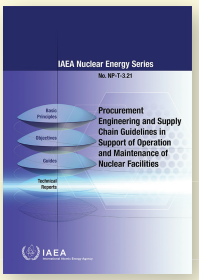



## Plant Life Management Models for Long Term Operation of Nuclear Power Plants

### IAEA Nuclear Energy Series No. NP-T-3.18

When nuclear power plants reach the end of their nominal design life, they undergo a special safety review and an ageing assessment of their essential structures, systems and components for the purpose of validating or renewing their licence to operate for terms beyond the service period originally intended. Three different plant life management models have been used to qualify these nuclear power plants to operate beyond their original design life. This publication presents a collection of sample licensing practices for long term operation among IAEA Member States. The various plant life management models used to obtain long term operation authorizations are described and comparisons drawn against the standard periodic safety review model. Lessons learned and warnings about possible complications and pitfalls are also described to minimize the licensing risk during operation and future long term operation applications. The main intention of this publication is to support nuclear power plant owners and operators planning an extension of plant operation beyond its original design life, but it also serves as a useful guide for those interested in procuring, from the beginning, the necessary tools to implement ageing management in their future plant with long term operation in mind.

**(134 pp., 43 figs; 2015) • ISBN 978-92-0-103014-6 • STI/PUB/1655 • €38.00**




## Procurement Engineering and Supply Chain Guidelines in Support of Operation and Maintenance of Nuclear Facilities

### IAEA Nuclear Energy Series No. NP-T-3.21

Procurement must be effectively managed to ensure availability of design functions throughout a nuclear facility's service life. Ineffective control of procurement process can jeopardize facility safety, reduce reliability, or can result in increased costs to operating organizations. This publication provides an overview of nuclear procurement processes, issues of special concern, and provides guidance for good practices to set up and manage a highquality procurement organization. Lessons learned for organizations considering new build nuclear projects are also included.

**(Forthcoming 2016) • ISBN 978-92-0-107315-0 • STI/PUB/1725 • €56.00**

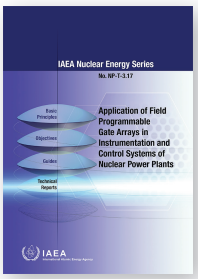
# REACTOR TECHNOLOGY

## Accelerator Simulation and Theoretical Modelling of Radiation Effects (SMoRE)

### IAEA Nuclear Energy Series No. NF-T-2.2

This publication summarizes the findings and conclusions of the IAEA coordinated research project (CRP) on accelerator simulation and theoretical modelling of radiation effects, aimed at supporting Member States in the development of advanced radiation-resistant structural materials for implementation in innovative nuclear systems. This aim can be achieved through enhancement of both experimental neutron-emulation capabilities of ion accelerators and improvement of the predictive efficiency of theoretical models and computer codes. This dual approach is challenging but necessary, because outputs of accelerator simulation experiments need adequate theoretical interpretation, and theoretical models and codes need high dose experimental data for their verification. Both ion irradiation investigations and computer modelling have been the specific subjects of the CRP, and the results of these studies are presented in this publication which also includes state-of-the-art reviews of four major aspects of the project: challenges and trends of structural materials development for present and future reactor designs, accelerator methodologies for material testing, multi-scale modelling tools, and advanced examination techniques.

**(Forthcoming 2016) • ISBN 978-92-0-107415-7 • STI/PUB/1732 • €39.00**




## Application of Field Programmable Gate Arrays in Instrumentation and Control Systems of Nuclear Power Plants

### IAEA Nuclear Energy Series No. NP-T-3.17

Field programmable gate arrays (FPGAs) are gaining increased attention worldwide for application in nuclear power plant (NPP) instrumentation and control (I&C) systems, particularly for safety and safety related applications, but also for non-safety ones. NPP operators and equipment suppliers see potential advantages of FPGA based digital I&C systems as compared to microprocessor based applications. This is because FPGA based systems can be made simpler, more testable and less reliant on complex software (e.g. operating systems), and are easier to qualify for safety and safety related applications. This publication results from IAEA consultancy meetings covering the various aspects, including design, qualification, implementation, licensing, and operation, of FPGA based I&C systems in NPPs.

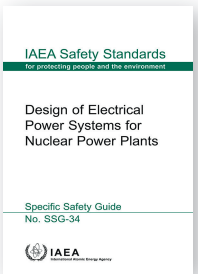
**(80 pp., 6 figs; 2016) • ISBN 978-92-0-103515-8 • STI/PUB/1701 • €33.00**

## Buried and Underground Piping and Tank Ageing Management for Nuclear Power Plants

### IAEA Nuclear Energy Series No. NP-T-3.20

This publication is one in a series of reports on the assessment and management of ageing of the major nuclear power plant (NPP) components. It deals with buried and underground piping and tank systems that are included as part of an NPP and addresses potential ageing mechanisms, age related degradation, and ageing management as well as condition assessments for the material and components of such systems. The intended target audience for this publication are NPP owners, operators, designers, engineers and specialists.

**(Forthcoming 2016) • ISBN 978-92-0-102116-8 • STI/PUB/1735 • €60.00**




## 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.

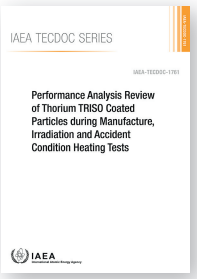
**(120 pp., 9 figs; 2016) • ISBN 978-92-0-109314-1 • STI/PUB/1673 • €47.00**

## Digital Instrumentation and Control Systems for New Facilities and Modernization of Existing Research Reactors

### IAEA Nuclear Energy Series No. NP-T-5.7

This publication draws on the results of a technical meeting which addressed key areas of modernization projects for instrumentation and control (I&C) systems in research reactors. The meeting provided a forum for international experts to exchange information on the technical and managerial aspects of I&C systems and modernisation projects specifically related to I&C and to discuss all technical areas relevant to the complex process of research reactor I&C system modernization and the use of digital I&C in new research reactor projects. The publication includes a summary of all papers and provides detailed guidance to research reactor operators intending on upgrading existing facilities from analogue to digital or older digital to newer digital technology, and to governments or agencies seeking to construct a new research facility with the latest digital I&C systems.

**(Forthcoming 2016) • ISBN 978-92-0-103015-3 • STI/PUB/1696 • €58.00**

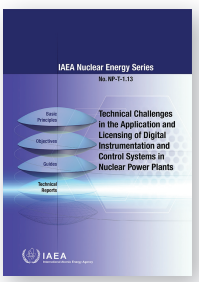



## Performance Analysis Review of Thorium TRISO Coated Particles during Manufacture, Irradiation and Accident Condition Heating Tests

### IAEA TECDOC Series No. 1761

This publication is the outcome of an IAEA coordinated research project on near term and promising long term options for deployment of thorium based nuclear energy. It is based on the compilation and analysis of available results on thorium tristructural isotropic (TRISO) coated particle fuel performance in manufacturing during irradiation and accident condition heating tests. As a result, the project participants concluded that the performance statistics for the high enriched thoria urania TRISO fuel system are in perfect concert with those state of the art requirements for present day high temperature reactor concepts.

**(2015) • ISBN 978-92-0-100715-5 • IAEA-TECDOC-1761 • €18.00**




## Technical Challenges in the Application and Licensing of Digital Instrumentation and Control Systems in Nuclear Power Plants

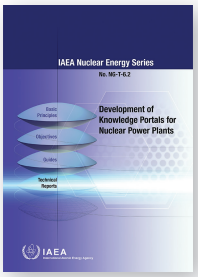
### IAEA Nuclear Energy Series No. NP-T-1.13

With the modernization of existing analogue instrumentation and control (I&C) systems in nuclear power plants through digital I&C technology, and the implementation of digital I&C systems in new plants, the industry is faced with significant challenges. These challenges appear in the form of difficulties in managing the necessarily incremental transition, highly integrated (and interdependent) architectures, the flexible configurability enabled by digital technology, and

uncertainty and inconsistency in licensing digital I&C systems and equipment in the different Member States. This publication discusses 17 major issues that utilities, developers, suppliers and regulatory stakeholders need to consider, so that the industry can capture and benefit from shared experience, recent technological developments, and emerging best practices.

**(65 pp., 3 figs; 2015) • ISBN 978-92-0-102915-7 • STI/PUB/1695 • €33.00**

# QUALIFICATION AND TRAINING OF PERSONNEL




## Development of Knowledge Portals for Nuclear Power Plants

### IAEA Nuclear Energy Series No. NG-T-6.2

Supporting earlier IAEA publications on knowledge management, this publication proposes guidelines for the development of a knowledge portal for nuclear power plants (NPPs), and covers the main design principles and the typical content of such a knowledge portal. The information provided is based upon actual experiences of NPP operating organizations in Member States as well as of other related industries.

**English Edition (38 pp., 16 figs; 2009) • ISBN 978-92-0-113008-2 • STI/PUB/1377 • €15.00**
**Russian Edition (Forthcoming 2016) • ISBN 978-92-0-405115-5 • STI/PUB/1377 • €15.00**

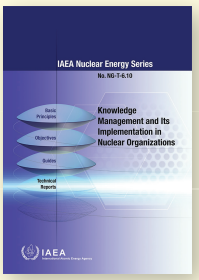
## International Conference on Human Resource Development for Nuclear Power Programmes: Building and Sustaining Capacity

***Summary of an International Conference Organized by the International Atomic Energy Agency Held in Vienna, Austria, 12–16 May 2014***

### Proceedings Series

This publication presents the summary of an international conference on human resource development for nuclear power programmes. The conference provided a forum for information exchange and best practices across governments, industry and education and research institutions. Main topics addressed challenges in human resource development (HRD), education and training, nuclear knowledge management, the establishment of knowledge networks and preparing the next generation of nuclear professionals. The meeting participants reviewed developments in the area of human resources globally, emphasized the importance of human resources and capacity building programmes, and highlighted practices and issues regarding HRD at the organizational and international level. Key findings, recommendations as well as the conclusions of the chairperson are presented. An accompanying CD-ROM contains all papers presented during the conference.

**(Forthcoming 2016) • ISBN 978-92-0-102516-6 • STI/PUB/1739 • €50.00**




## Knowledge Management and Its Implementation in Nuclear Organizations

### IAEA Nuclear Energy Series No. NG-T-6.10

The IAEA's nuclear knowledge management activities provide guidance in knowledge management and assist in transferring and preserving knowledge, exchanging information, establishing and supporting cooperative networks and in training the next generation of nuclear experts. This publication shares best practices and experiences based on the knowledge management assist visit programme undertaken by IAEA expert teams during the period 2005–2013. These visits have involved different types of organizations, including nuclear power plants, nuclear R&D organizations and nuclear based educational establishments such as universities. Based on the records of these visits, a secondary aim of this publication is to provide feedback and recommendations for future development of the assessment tool(s) and participating organizations for improving future assistance.

**(52 pp., 4 figs; 2016) • ISBN 978-92-0-107215-3 • STI/PUB/1724 • €31.00**

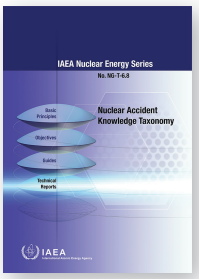
## Maintaining Knowledge, Training and Infrastructure for Research and Development in Nuclear Safety

***A Report by the International Nuclear Safety Group***

### INSAG Series No. 16

This INSAG report, which was previously issued as INSAG Note No. 4, discusses the role that safety research has played, the present declining trend and the circumstances that are critical in maintaining a research infrastructure. The report describes new and emerging challenges that necessitate continued support of research and education opportunities and provides recommendations on how sufficient research capacity and competence can be maintained. The report is written for decision makers in government, industry and international organizations who have responsibility for research activities and educational facilities.

**English Edition (13 pp.; 2003) • ISBN 92-0-113203-4 • STI/PUB/1179 • €9.00**
**Russian Edition (15 pp.; 2015) • ISBN 978-92-0-406615-9 • STI/PUB/1179 • €9.00**




## Nuclear Accident Knowledge Taxonomy

### IAEA Nuclear Energy Series No. NG-T-6.8

There is a need to categorize and structure knowledge related to nuclear accidents. Development of the structure is challenging unless conducted with consideration of the experience of people who were involved in the accidents. In order to support those activities, the IAEA has taken a leading role to assist in the development of a knowledge organization system and associated taxonomy for nuclear accident knowledge domain, which could be implemented

and applied by Member States' nuclear organizations. This publication is intended to support Member State activity in managing knowledge from serious nuclear accidents, providing a description of knowledge organization system features, information about the developed system taxonomy, and details on the methodology to organize knowledge in this area.

**(37 pp., 5 figs; 2016) • ISBN 978-92-0-101416-0 • STI/PUB/1730 • €28.00**

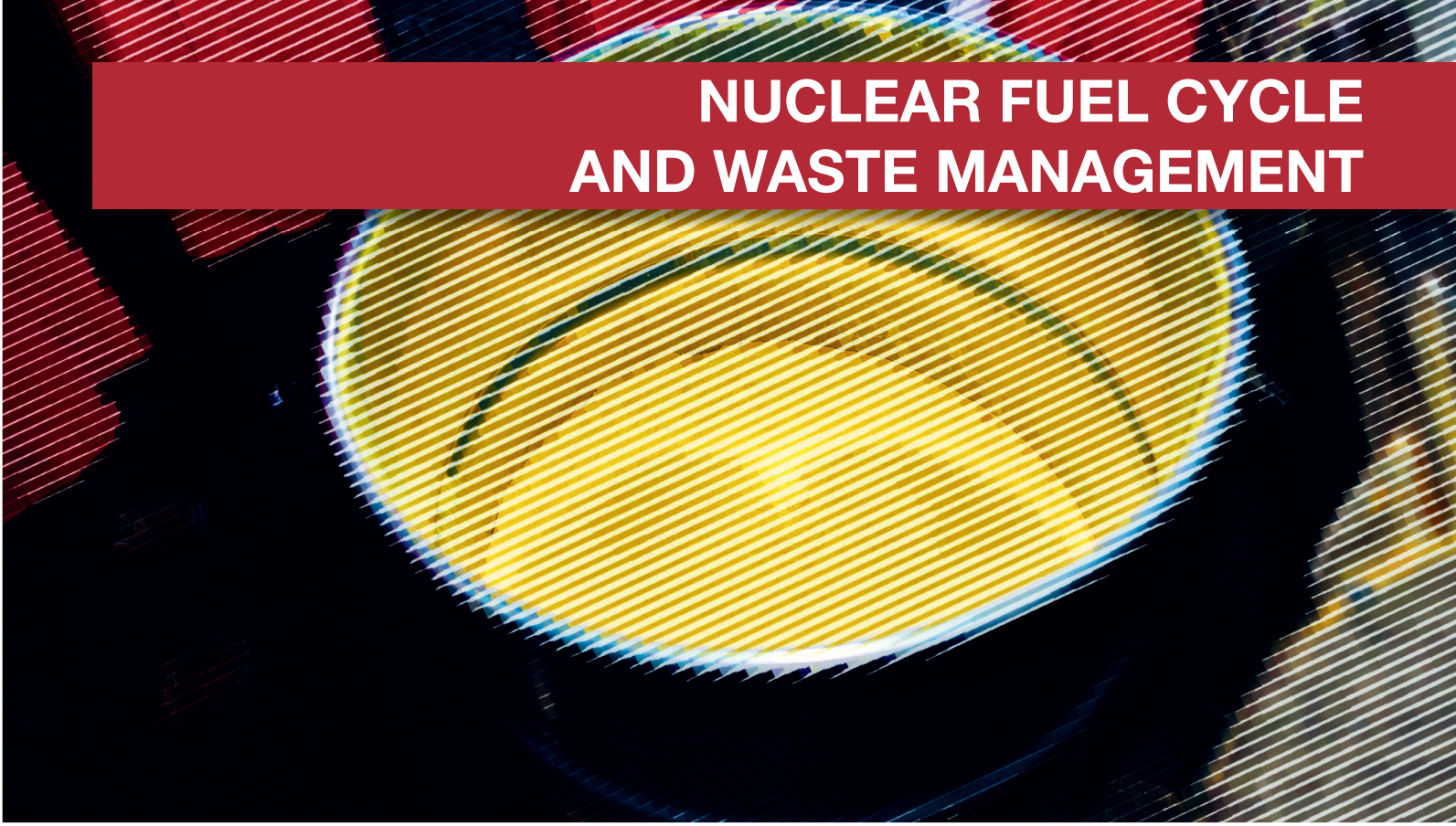
## Practical Approaches to Risk Management of Knowledge Loss in Nuclear Organizations

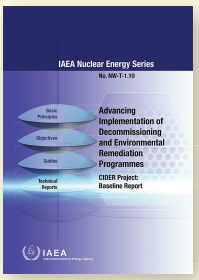
### IAEA Nuclear Energy Series No. NG-T-6.11

This publication provides a methodology to enable knowledge loss risk management to ensure safe, reliable and efficient operation of nuclear facilities. It focuses on aspects of knowledge loss risks associated with employee attrition and provides guidance to mitigate them. The described methodology has proved itself in nuclear power plants and can be adopted by any other nuclear related organization. The publication also provides examples of best practices (case studies) of effective knowledge loss risk management gathered from the nuclear power plants and nuclear related organizations as outlined in annexes I-V.

**(Forthcoming 2016) • ISBN 978-92-0-101816-8 • STI/PUB/1734 • €30.00**

# NUCLEAR FUEL CYCLE AND WASTE MANAGEMENT





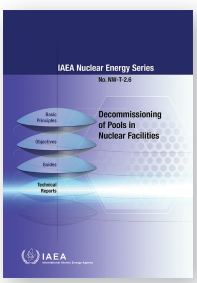

## Advancing Implementation of Decommissioning and Environmental Remediation Programmes

***CIDER Project: Baseline Report***

**IAEA Nuclear Energy Series No. NW-T-1.10**

Despite significant progress having been achieved in recent years, much remains to be done in terms of addressing the legacies from the early development of nuclear energy, including the dismantling of redundant research and fuel cycle facilities, research reactors and power plants, and the remediation of sites affected by past uranium mining and processing operations. Some countries are moving forward with dealing with these legacies, and accordingly have built up appropriate technical resources and expertise, but many national programmes still face very significant challenges. This publication discusses the barriers that prevent the implementation of decommissioning and environmental remediation (D&ER) projects and provides potential solutions to overcome the identified barriers and thereby facilitates a better implementation of D&ER programmes.

**(99 pp., 7 figs; 2016) • ISBN 978-92-0-101316-3 • STI/PUB/1729 • €37.00**

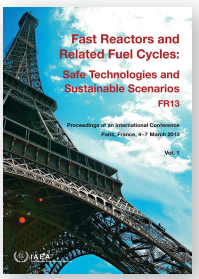



## Decommissioning of Pools in Nuclear Facilities

**IAEA Nuclear Energy Series No. NW-T-2.6**

Pools or ponds are usually an integrated part of a more complex nuclear facility, but in some particular cases pools may be considered as a separate nuclear facility with a specific license. A number of nuclear installations utilize pools for the cooling of spent fuel, or the shielding of research reactor cores or irradiator sources. Over a service lifetime that can span decades, nuclear pools may become contaminated as a result of the deposition of radioactive substances. Relevant aspects of pool decommissioning covered in this publication include project planning and management, health and safety, and the management of resulting waste.

**(197 pp., 81 figs; 2015) • ISBN 978-92-0-103115-0 • STI/PUB/1697 • €55.00**




## Fast Reactors and Related Fuel Cycles: Safe Technologies and Sustainable Scenarios (FR13)

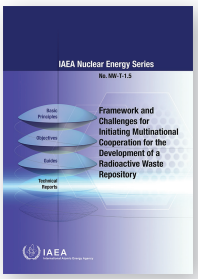
***Proceedings of an International Conference Held in Paris, France, 4–7 March 2013***

***2 volumes***

**Proceedings Series**

This publication presents the proceedings of an international conference in the field of fast reactors and related fuel cycle technologies. The conference provided a unique forum to discuss national and international fast reactor programmes, analyse new experience and advances arising from research and development programmes, and identify needs to be addressed in relation to the industrial deployment of fast reactors. A CD-ROM with invited papers and contributed papers accompanies this publication and is available on this website. The papers in these proceedings were peer reviewed by members of the International Scientific Programme Committee.

**(519 pp., 168 figs; 2015) • ISBN 978-92-0-104114-2 • STI/PUB/1665 • €98.00**

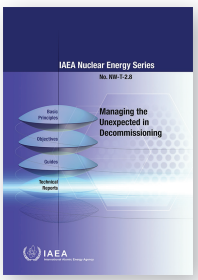



## Framework and Challenges for Initiating Multinational Cooperation for the Development of a Radioactive Waste Repository

### IAEA Nuclear Energy Series No. NW-T-1.5

This publication is concerned with radioactive waste that requires geological disposal. It discusses the partnership arrangements necessary for the development of a multinational repository for disposal of this waste, but it also emphasizes that countries should not rely solely on a multinational solution and should in addition have coherent national plans for disposal (a dual track strategy). The publication focuses on multinational approaches based on the IAEA scenario for cooperation among countries in joint projects for the establishment of a shared geological repository. It describes the phased approach that would be needed, indicating the decision processes to be undertaken by partners in the multinational project, both within a national context and in the scope of the joint endeavour. It highlights a wide range of legal and institutional aspects, including the contractual obligations among partners, the economic and financial arrangements, liabilities, nuclear security, regulatory and legislative aspects, waste transportation arrangements, and social issues. It also addresses the uncertainties and risks involved in the implementation of a multinational repository.

**(45 pp., 1 fig.; 2016) • ISBN 978-92-0-111115-9 • STI/PUB/1722 • €32.00**

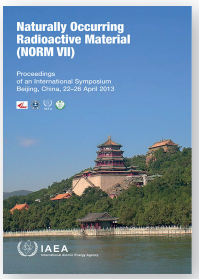



## Managing the Unexpected in Decommissioning

### IAEA Nuclear Energy Series No. NW-T-2.8

This publication explores the implications of decommissioning in the light of unexpected events and the trade-off between activities to reduce them and factors militating against any such extra work. It classifies and sets out some instances where unexpected findings in a decommissioning programme led to a need to either stop, or reconsider the work, re-think the options, or move forward on a different path. It provides practical guidance in planning and management of decommissioning taking into account unexpected events. This guidance includes an evaluation of the experience and lessons learned in tackling decommissioning that is often neglected. Thus it will enable future decommissioning teams to adopt the relevant lessons to reduce additional costs, time delays and radiation exposures.

**(157 pp., 36 figs; 2016) • ISBN 978-92-0-103615-5 • STI/PUB/1702 • €35.00**




## Naturally Occurring Radioactive Material (NORM VII)

### *Proceedings of an International Symposium Held in Beijing, China, 22–26 April 2013*

### Proceedings Series

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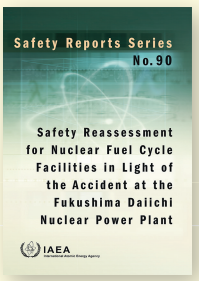
**(686 pp., 112 figs; 2015) • ISBN 978-92-0-104014-5 • STI/PUB/1664 • €95.00**




## Safety Reassessment for Nuclear Fuel Cycle Facilities in Light of the Accident at the Fukushima Daiichi Nuclear Power Plant

### Safety Reports Series No. 90

This publication provides guidance on performing safety reassessments, in the light of the accident at the Fukushima Daiichi nuclear power plant and in accordance with a graded approach, for nuclear fuel cycle facilities of all types. Although this publication primarily focuses on nuclear fuel cycle facilities that are in operation, the guidance it provides also applies to facilities that are in the design and construction phases. It is not intended to replace or supersede any of the requirements or guidance provided by the relevant IAEA Safety Standards, including those covering safety analysis, evaluation of seismic and external hazards, and emergency preparedness and response for nuclear fuel cycle facilities. However, this publication should be used in close conjunction with these Safety Standards.

**(45 pp., 2 figs; 2016) • ISBN 978-92-0-101916-5 • STI/PUB/1726 • €40.00**

# FUEL FABRICATION AND PERFORMANCE

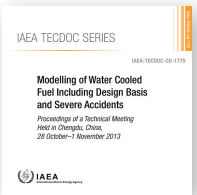
## Evaluation of Conditions for Hydrogen Induced Degradation of Zirconium Alloys during Fuel Operation and Storage

***Final Report of a Coordinated Research Project 2011–2015***

**IAEA TECDOC Series No. 1781**

This publication summarizes the research work undertaken as part of an IAEA coordinated research project (CRP) on evaluation of conditions for hydrogeninduced degradation of zirconium alloys during fuel operation and storage, and includes details of the experimental procedures to evaluate the threshold condition for delayed hydride cracking that led to a set of data for these materials. Besides the goal to transfer the technology of the testing techniques from experienced laboratories to those unfamiliar with the methods, the CRP was set up to develop experimental procedures to produce consistent sets of data, both within a single laboratory and between different laboratories.

**(2015) • ISBN 978-92-0-110715-2 • IAEA-TECDOC-1781 • €18.00**



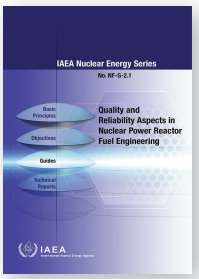

## Modelling of Water Cooled Fuel Including Design Basis and Severe Accidents

***Proceedings of a Technical Meeting Held in Chengdu, China, 28 October–1 November 2013***

**IAEA TECDOC Series No. 1775**

Nuclear fuel performance and management play an essential role in ensuring safety, competitiveness and public acceptance of nuclear power. Reliability of fuel depends on its proper design, manufacturing, and ability to withstand required normal operational conditions, as well as possible accidents. In-reactor loads on the core materials are extremely high, which defines a need for detailed R&D as a basis for prediction of in-pile fuel behaviour. The Fukushima Daiichi accident has demonstrated the need for adequate analysis of all aspects of fuel performance to prevent a failure, and also to mitigate consequences if an accident occurs. In order to satisfy these demands, new national and international programmes have been launched and advanced modelling codes have been developed. The experience and lessons learned during three sessions of an IAEA technical meeting on modelling of water cooled fuel, including design basis and severe accidents are presented in this publication.

**(2015) • ISBN 978-92-0-158615-5 • IAEA-TECDOC-CD-1775 • €18.00**




## Quality and Reliability Aspects in Nuclear Power Reactor Fuel Engineering

**IAEA Nuclear Energy Series No. NF-G-2.1**

In order to decrease costs and increase competitiveness, nuclear utilities use more challenging operational conditions, longer fuel cycles and higher burnups, which require modifications in fuel designs and materials. Different aspects of quality assurance and control, as well as analysis of fuel performance have been considered in a number of specialized publications. The present publication provides a concise but comprehensive overview of all interconnected quality and reliability issues in fuel fabrication, design and operation. It jointly tackles technical, safety and organizational aspects, and contains examples of state of the art developments and good practices of coordinated work of fuel designers, vendors and reactor operators.

**(130 pp., 43 figs; 2015) • ISBN 978-92-0-103114-3 • STI/PUB/1656 • €40.00**

## Research Reactors for Development of Materials and Fuels for Innovative Nuclear Energy Systems: A Compendium

**IAEA Nuclear Energy Series No. NP-T-5.8**

This publication presents an overview of research reactor capabilities and capacities in the development of fuels and materials for innovative nuclear reactors, such as GenIV reactors. The compendium provides comprehensive information on the potential for materials and fuel testing research of 30 research reactors, both operational and in development. This information includes their power levels, mode of operation, current status, availability and historical overview of their utilization. A summary of these capabilities and capacities is presented in the overview tables of Section 6. Papers providing a technical description of the research reactors, including their specific features for utilization are collected as profiles on a CD-ROM and represent an integral part of this publication. The publication is intended to foster wider access to information on existing research reactors with capacity for advanced material testing research and thus ensure their increased utilization in this particular domain. It is expected that it can also serve as a supporting tool for the establishment of regional and international networking through research reactor coalitions and IAEA designated international centres based on research reactors.

**(Forthcoming 2016) • ISBN 978-92-0-100816-9 • STI/PUB/1728 • €32.00**

# SPENT FUEL MANAGEMENT

## Available Reprocessing and Recycling Services for Research Reactor Spent Nuclear Fuel

**IAEA Nuclear Energy Series No. NW-T-1.11**

The high enriched uranium (HEU) take back programmes will soon have achieved their goals. When there are no longer

HEU inventories at research reactors and no commerce in HEU for research reactors, the primary driver for the take back programmes will cease. However, research reactors will continue to operate in order to meet their various mission objectives. As a result, inventories of low enriched uranium spent nuclear fuel (LEU SNF) will continue to be created during the research reactors lifetime and, therefore, there is a need to develop national final disposition routes. This publication is designed to address the issues of available reprocessing and recycling services for research reactor spent fuel and discusses the various back end management aspects of the research reactor fuel cycle.

**(Forthcoming 2016) • ISBN 978-92-0-103216-4 • STI/PUB/1746 • €38.00**


## Management of Spent Fuel from Nuclear Power Reactors

***Proceedings of an International Conference Held in Vienna, Austria, 31 May–4 June 2010***

**Proceedings Series**

This publication presents the proceedings of an international conference on spent fuel management organized by the IAEA in cooperation with the NEA of the OECD. The conference covered a broad range of topics from national strategies through safety and regulatory aspects, transport, technical innovation, fuel and material behaviour, operational experience with storage, new fuel and reprocessing developments, and long term storage and disposal. The conference also featured two round table discussion sessions covering regulatory frameworks and stakeholder issues. The proceedings include the opening presentations and the President's summary and the conclusions of the conference. A CD-ROM with contributed papers accompanies the publication.

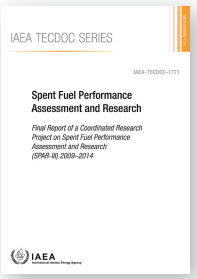
**(50 pp.; 2015) • ISBN 978-92-0-103714-5 • STI/PUB/1661 • €40.00**

## Potential Interface Issues in Spent Fuel Management

**IAEA TECDOC Series No. 1774**

Taking a holistic view of the nuclear fuel cycle ensures that influences from and impacts on all phases of the nuclear fuel cycle are clearly understood. This general view facilitates effective decision making in the back end of the fuel cycle (BEFC). It is important therefore, to establish interfaces and any potential issues which can impact on parts or the whole of the BEFC at an early stage. Particular challenges include maintaining flexibility to accommodate the range of potential future spent fuel disposition options as well as defining and addressing the relevant issues in storage and transportation; given the uncertainties regarding the storage duration, the availability of future technologies and also of future financial, regulatory and political conditions. This publication provides an approach to identify the interfaces in the BEFC as well as the potential issues related to those interfaces that should be addressed. It also provides examples of Member States approaches on identifying and addressing interface issues.

**(2015) • ISBN 978-92-0-108715-7 • IAEA-TECDOC-1774 • €18.00**




## Spent Fuel Performance Assessment and Research

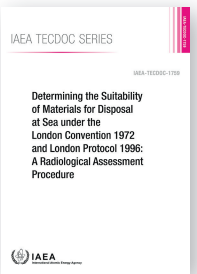
***Final Report of a Coordinated Research Project on Spent Fuel Performance Assessment and Research (SPAR III) 2009–2014***

**IAEA TECDOC Series No. 1771**

Since 1981 the IAEA has been organizing coordinated research projects on the behaviour of power reactor spent fuel during long term (or extended) storage. The current publication provides an update on national spent fuel management strategies, ongoing spent fuel and system performance in wet and dry storage, and latest national research and development activities relating to spent fuel storage. It contains useful information on hydride re-orientation and the impact of fuel, storage system components, emerging issues on very long term storage, and the storage of metal fuel in a closed system. The experience and insights provided by the participating countries will help Member States to identify challenges in implementing long term storage and to understand the current status of spent fuel performance research related to long term storage.

**(2015) • ISBN 978-92-0-108215-2 • IAEA-TECDOC-1771 • €18.00**

# WASTE MANAGEMENT

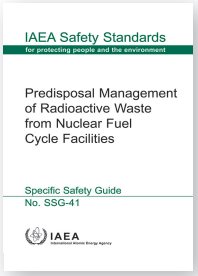



## Determining the Suitability of Materials for Disposal at Sea under the London Convention 1972 and London Protocol 1996: A Radiological Assessment Procedure

**IAEA TECDOC Series No. 1759**

This publication provides guidance on performing specific assessments of candidate materials for dumping at sea, to determine whether the materials are de minimis in the meaning of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (the London Convention 1972) and the related Protocol 1996 (the London Protocol 1996). It presents a detailed radiological procedure to assess doses to workers and members of the public and doses to marine flora and fauna related to the dumping of materials at sea. The procedures in this publication follow the requirements to protect the environment in the IAEA Safety Standards and in the recommendations by the International Commission on Radiological Protection. It is expected to be used by national regulatory authorities responsible for authorizing disposal at sea of candidate materials as well as by those companies and individuals applying to obtain permission to dispose these materials at sea.

**(2015) • ISBN 978-92-0-100215-0 • IAEA-TECDOC-1759 • €18.00**



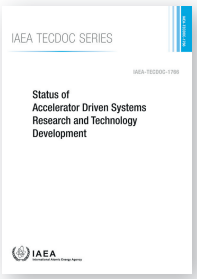

## Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities

***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.

**(Forthcoming 2016) • ISBN 978-92-0-110315-4 • STI/PUB/1720 • €43.00**

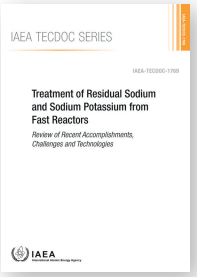



## Status of Accelerator Driven Systems Research and Technology Development

### IAEA TECDOC Series No. 1766

One of the greatest challenges for nuclear energy is how to properly manage the highly radioactive waste generated during irradiation in nuclear reactors. Accelerator Driven Systems (ADSs) may offer new prospects and advantages for the transmutation of such high level nuclear waste. ADS or accelerator driven transmutation of waste (ATW) consists of a high power proton accelerator, a heavy metal spallation target that produces neutrons when bombarded by the high power beam, and a sub-critical core that is neutronically coupled to the spallation target. This publication provides a comprehensive state of the art of the ADS technology by representing the different ADS concepts proposed worldwide in the last 15 years, as well as the related R&D activities and demonstration initiatives carried out at national international level.

**(2015) • ISBN 978-92-0-105315-2 • IAEA-TECDOC-1766 • €18.00**




## Treatment of Residual Sodium and Sodium Potassium from Fast Reactors

***Review of Recent Accomplishments, Challenges and Technologies***

### IAEA TECDOC Series No. 1769

This publication covers a range of topics related to removal of residual radioactive sodium and sodium potassium coolant from reactor vessels and components in connection with decommissioning of liquid metal cooled reactors. The testing and application of relevant key technologies in five countries at a number of facilities are described. The technologies include passivation of the residuals, methods to control and monitor the processes, and also gaining access to locations that are difficult to reach and where residual sodium may be found. Non-radioactive sodium waste is not specifically considered in this publication. However, the approach, procedures, and recommendations that apply to safe management of radioactive sodium waste are also largely applicable to non-radioactive sodium. In addition to the technical topics, lessons learned for management of removal and disposal of residual sodium and sodium potassium are also presented.

**(2015) • ISBN 978-92-0-106315-1 • IAEA-TECDOC-1769 • €18.00**

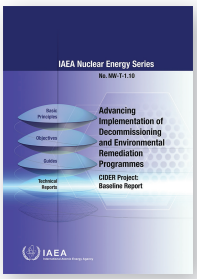

## International Safeguards in the Design of Fuel Fabrication Plants

### IAEA Nuclear Energy Series No. NF-T-4.7

This publication is the third in a series from the IAEA that provides guidance on the early consideration of safeguards requirements in the design and construction of nuclear facilities. It is principally intended for designers and operators of nuclear fuel fabrication facilities; however, vendors, state authorities and investors may also benefit from the information provided. This guidance is introductory rather than comprehensive; more detailed information on IAEA safeguards implementation can be found in the Guidance for States Implementing Comprehensive Safeguards Agreements and Additional Protocols (IAEA Services Series No. 21, May 2016) and other publications in that series. This publication expands upon the general considerations addressed in International Safeguards in Nuclear Facility Design and Construction (IAEA Nuclear Energy Series No. NP-T-2.8, April 2013).

**(Forthcoming 2016) • ISBN 978-92-0-103315-4 • STI/PUB/1699 • €30.00**

# ENVIRONMENT

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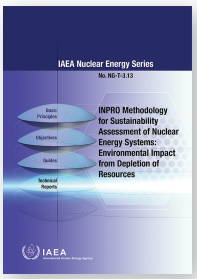


## INPRO Methodology for Sustainability Assessment of Nuclear Energy Systems: Environmental Impact from Depletion of Resources

**IAEA Nuclear Energy Series No. NG-T-3.13**

INPRO is an international project to help ensure that nuclear energy is available to contribute in a sustainable manner to meeting the energy needs of the 21st century. A basic principle of INPRO in the area of environmental impact from depletion of resources is that a nuclear energy system will be capable of contributing to the energy needs in the 21st century while making efficient use of non-renewable resources needed for construction, operation and decommissioning. Recognizing that a national nuclear energy programme in a given country may be based both on indigenous resources and resources purchased from abroad, this publication provides background materials and summarizes the results of international global resource availability studies that could contribute to the corresponding national assessments.

**(62 pp., 25 figs; 2015) • ISBN 978-92-0-103415-1 • STI/PUB/1700 • €33.00**

## INPRO Methodology for Sustainability Assessment of Nuclear Energy Systems: Environmental Impact of Stressors

**IAEA Nuclear Energy Series No. NG-T-3.15**

This publication provides guidance on assessing of sustainability of a nuclear energy system (NES) in the area of environmental impact of stressors. The INPRO methodology is a comprehensive tool for the assessment of sustainability of an NES. Basic principles, user requirements and criteria

have been defined in different areas of INPRO methodology. These include economics, infrastructure, waste management, proliferation resistance, environmental impact of stressors, environmental impact from depletion of resources, and safety of nuclear reactors and fuel cycle facilities. The ultimate goal of the application of the INPRO methodology is to check whether the assessed NES fulfils all the criteria, and hence the user requirements and basic principles, and therefore presents a system for a Member State that is sustainable in the long term.

**(Forthcoming 2016) • ISBN 978-92-0-101616-4 • STI/PUB/1733 • €38.00**


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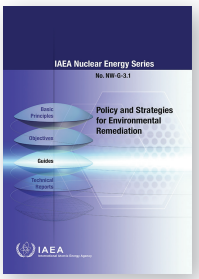



## Policy and Strategies for Environmental Remediation

### IAEA Nuclear Energy Series No. NW-G-3.1

To assure the safe, technically optimal and cost effective management of remediation situations, appropriate policies and strategies are required. This publication describes the goals, time scales, efforts necessary for implementation, cost allocation and the different interests of concerned parties with regard to environmental remediation works. It clarifies the differences between a policy and a strategy, and provides advice to Member States on the typical composition and formulation of such documents. Along with previously published IAEA safety publications on environmental remediation, this publication will help national authorities to recognize the necessity for including environmental remediation as a required component in the planning and execution of nuclear related initiatives. Recent events have shown that the existence of an established policy and strategies on environmental remediation prior to nuclear and/or radiological accidents can be of fundamental importance, as it will among other things facilitate the dialogue to be established with affected parties.

**(32 pp.; 2015) • ISBN 978-92-0-103314-7 • STI/PUB/1658 • €20.00**

# NUCLEAR SECURITY AND PHYSICAL PROTECTION OF RADIOACTIVE MATERIAL



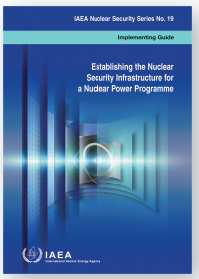
## Advances in Nuclear Forensics: Countering the Evolving Threat of Nuclear and Other Radioactive Material out of Regulatory Control

***Summary of an International Conference Held in Vienna, Austria, 7–10 July 2014***

**Proceedings Series**

For the first time, the IAEA convened an international conference dedicated exclusively to nuclear forensics. Experts, senior officials and policy makers from more than 76 Member States and eight organizations with established or emerging capabilities in nuclear forensics participated. The conference recognized the important role of nuclear forensics as part of a nuclear security infrastructure to include support to law enforcement investigations and nuclear security vulnerability assessments. The proceedings provide a summary of the conference deliberations, outcomes and conclusions, as well as an outlet for contributed scientific papers and posters that represent nuclear forensic state of practice. Papers address the role of nuclear forensics in a nuclear security infrastructure, the elements of a nuclear forensic examination, confidence in findings, development and sustainability of a nuclear forensic capability at the national level, lessons learned from case studies and other applications, international cooperation with scientific and law enforcement partners, as well as assistance available in nuclear forensics from the IAEA, upon request, to include technical guidance, training, and research.

**(149 pp.; 2015) • ISBN 978-92-0-104815-8 • STI/PUB/1706 • €65.00**

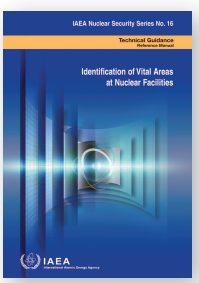



## Establishing the Nuclear Security Infrastructure for a Nuclear Power Programme

**IAEA Nuclear Security Series No. 19**

This publication provides guidance on the actions to be taken by a State in implementing an effective nuclear security infrastructure for a nuclear power programme. The topics covered are: development of national policy and strategy; common nuclear security measures; infrastructure issues relating to nuclear and other radioactive material; associated facilities; and cooperation with other States. The guidance provided is intended primarily for use by national policy makers, national legislators, competent authorities, institutions and individuals involved in the establishment, implementation, maintenance or sustainability of the nuclear security infrastructure for a nuclear power programme.

**Arabic Edition (79 pp., 1 fig.; 2015) • ISBN 978-92-0-609515-7 • STI/PUB/1591 • €29.00**
**English Edition (73 pp., 1 fig.; 2013) • ISBN 978-92-0-138010-4 • STI/PUB/1591 • €29.00**



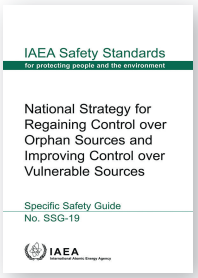

## Identification of Vital Areas at Nuclear Facilities

**IAEA Nuclear Security Series No. 16**

This publication provides detailed guidance with regard to the identification of vital areas at nuclear facilities. It presents a structured approach to identifying those areas that contain equipment, systems and components to be protected against sabotage. The process for selection of a specific set of vital areas to be protected is based on

consideration of the potential radiological consequences of sabotage, and on the design, operational and safety features of a nuclear facility. The method builds upon safety analysis to develop logic models for sabotage scenarios that could cause unacceptable radiological consequences. The sabotage actions represented in the logic models are linked to the areas from which they can be accomplished. The logic models are then analysed to determine areas that should be protected to prevent these unacceptable radiological consequences. The publication is part of a set of supporting publications in the IAEA Nuclear Security Series with the aim of assisting States in the design, implementation and evaluation of their physical protection systems for nuclear material and nuclear facilities.

**English Edition (37 pp., 2 figs; 2013) • ISBN 978-92-0-114410-2 • STI/PUB/1505 • €22.00**
**French Edition (39 pp., 2 figs; 2016) • ISBN 978-92-0-210915-5 • STI/PUB/1505 • €22.00**



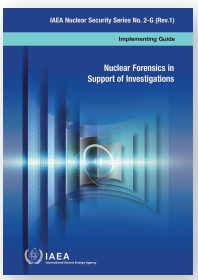

## National Strategy for Regaining Control over Orphan Sources and Improving Control over Vulnerable Sources

***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**




## Nuclear Forensics in Support of Investigations

### IAEA Nuclear Security Series No. 2-G (Rev. 1)

This publication is a revision of IAEA Nuclear Security Series No. 2, Nuclear Forensics Support, which was published in 2006. Since then, there has been substantive expansion and confidence in the application of nuclear forensics globally to effectively counter the threat of nuclear and other radioactive materials out of regulatory control. Most significantly, nuclear forensics has been applied in response to a number of incidents involving the illicit trafficking of highly enriched uranium and plutonium. The essential lessons learned from these experiences are incorporated in the revised publication to update the procedures and methods used in the conduct of a nuclear forensic examination as well as stress the importance of international cooperation.

**(80 pp., 2 figs; 2015) • ISBN 978-92-0-102115-1 • STI/PUB/1687 • €38.00**

## Nuclear Security in the Uranium Extraction Industry

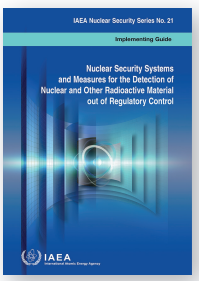
This publication provides States and operators with advice for defining, implementing, maintaining or enhancing their nuclear security regime for the protection of uranium ore concentrate against unauthorized removal. It defines prudent management practice as required by IAEA Nuclear Security Series No. 13, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), for this category of material. This advice can be adopted in the form of regulations or applied as voluntary standards. States, regulatory bodies, and industry may choose to tailor their implementation of this advice to meet their national circumstances.

**(2016) • ISBN 978-92-0-110815-9 • IAEA-TDL-003 • €18.00**

## Nuclear Security Management for Research Reactors and Related Facilities

This publication provides a single source guidance to assist those responsible for the implementation of nuclear security measures at research reactors and associated facilities in developing and maintaining an effective and comprehensive programme covering all aspects of nuclear security on the site. It is based on national experience and practices as well as on publications in the field of nuclear management and security. The scope includes security operations, security processes, and security forces and their relationship with the State's nuclear security regime. The guidance is provided for consideration by States, competent authorities and operators.

**(2016) • ISBN 978-92-0-111315-3 • IAEA-TDL-004 • €18.00**



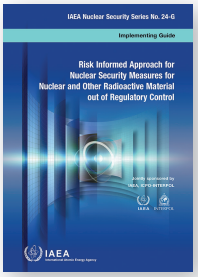

## Nuclear Security Systems and Measures for the Detection of Nuclear and Other Radioactive Material out of Regulatory Control

### IAEA Nuclear Security Series No. 21

This publication provides guidance to Member States for the development, or improvement of, nuclear security systems and measures for the detection of criminal or unauthorized acts with nuclear security implications involving nuclear and other radioactive material out of regulatory control. It describes the elements of an effective nuclear security detection architecture which is comprised of an integrated set of nuclear security systems and measures, and is based on an appropriate legal and regulatory framework for the implementation of the national detection strategy. The publication is an implementing guide within the IAEA Nuclear Security Series and is intended for use by national policy makers, legislative bodies, competent authorities, institutions, and individuals involved in the establishment, implementation, maintenance or sustainability of nuclear security systems and

measures for the detection of nuclear and other radioactive material out of regulatory control.

**Arabic Edition (66 pp., 3 figs; 2015) • ISBN 978-92-0-605515-1 • STI/PUB/1613 • €30.00**
**English Edition (60 pp., 3 figs; 2013) • ISBN 978-92-0-142910-0 • STI/PUB/1613 • €30.00**
**Russian Edition (Forthcoming 2017) • ISBN 978-92-0-409514-2 • STI/PUB/1613 • €30.00**

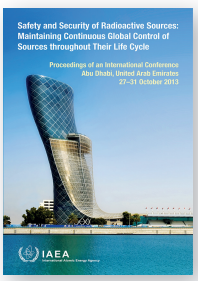



## Risk Informed Approach for Nuclear Security Measures for Nuclear and Other Radioactive Material out of Regulatory Control

### IAEA Nuclear Security Series No. 24-G

This publication provides guidance to States for developing a risk informed approach and for conducting threat and risk assessments as the basis for the design and implementation of sustainable nuclear security systems and measures for prevention of, detection of, and response to criminal and intentional unauthorised acts involving nuclear and other radioactive material out of regulatory control. It describes concepts and methodologies for a risk informed approach, including identification and assessment of threats, targets, and potential consequences; threat and risk assessment methodologies; and the use of risk informed approaches as the basis for informing the development and implementation of nuclear security systems and measures. The publication is an Implementing Guide within the IAEA Nuclear Security Series and is intended for use by national policy makers, law enforcement agencies and experts from competent authorities and other relevant organizations involved in the establishment, implementation, maintenance or sustainability of nuclear security systems and measures related to nuclear and other radioactive material out of regulatory control.

**(69 pp., 11 figs; 2015) • ISBN 978-92-0-100315-7 • STI/PUB/1678 • €41.00**



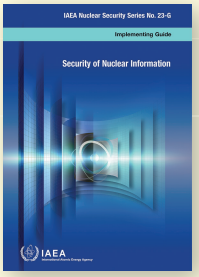

## Safety and Security of Radioactive Sources: Maintaining Continuous Global Control of Sources throughout Their Life Cycle

***Proceedings of an International Conference Held in Abu Dhabi, United Arab Emirates, 27–31 October 2013***

### Proceedings Series

The IAEA works with its Member States to help them ensure the safety and security of radioactive sources. The purpose of this conference was to review current success and challenges in ensuring the safety and security of radioactive sources and to identify means to maintain the highest level of safety and security throughout their life cycle, from manufacture to disposal. These proceedings contain the opening addresses, the invited and contributed papers presented during the sessions, and summaries of the discussions. The accompanying CD-ROM contains the presentations of most of the papers presented orally, as well as the complete text of the printed volume. The CD-ROM also contains the national reports on implementation of the Code of Conduct submitted to the conference by States, as per the formalized process established in 2006.

**(783 pp., 134 figs; 2015) • ISBN 978-92-0-105214-8 • STI/PUB/1667 • €90.00**

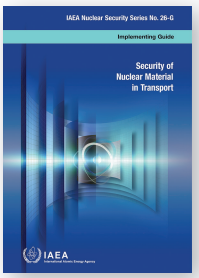



## Security of Nuclear Information

### IAEA Nuclear Security Series No. 23-G

This publication provides guidance on implementing the principle of confidentiality and on the broader aspects of information security (i.e. integrity and availability). It assists States in bridging the gap between existing government and industry standards on information security, the particular concepts and considerations that apply to nuclear security and the special provisions and conditions that exist when dealing with nuclear material and other radioactive material. Specifically it seeks to assist States in the identification, classification, and assignment of appropriate security controls to information that could adversely impact nuclear security if compromised.

**(54 pp.; 2015) • ISBN 978-92-0-110614-8 • STI/PUB/1677 • €30.00**

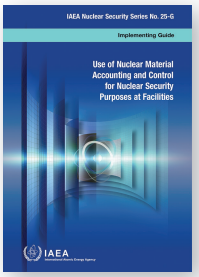



## Security of Nuclear Material in Transport

### IAEA Nuclear Security Series No. 26-G

This publication provides guidance to States and their competent authorities on how to implement and maintain a physical protection regime for transport of nuclear material. It will also be useful to shippers or carriers in the design and implementation of their physical protection systems. The publication builds upon the Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), IAEA Nuclear Security Series No. 13, and provides additional guidance on how to implement these recommendations in practice.

**(104 pp., 2 figs; 2015) • ISBN 978-92-0-102015-4 • STI/PUB/1686 • €48.00**




## Use of Nuclear Material Accounting and Control for Nuclear Security Purposes at Facilities

### IAEA Nuclear Security Series No. 25-G

Nuclear material accounting and control (NMAC) works in a complementary fashion with the international safeguards programme and physical protection systems to help prevent, deter or detect the unauthorized acquisition and use of nuclear materials. These three methodologies are employed by Member States to defend against external threats, internal threats and both state actors and non-state actors. This publication offers guidance

for implementing NMAC measures for nuclear security at the nuclear facility level. It focuses on measures to mitigate the risk posed by insider threats and describes elements of a programme that can be implemented at a nuclear facility in coordination with the physical protection system for the purpose of deterring and detecting unauthorized removal of nuclear material.

**(63 pp.; 2015) • ISBN 978-92-0-101915-8 •
STI/PUB/1685 • €30.00**

## IAEA Human Health Reports Series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| IAEA Human Health Reports No. 12 | The Transition from 2-D Brachytherapy to 3-D High Dose Rate Brachytherapy | 4 |
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## IAEA Human Health Series


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## 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.

Please note that this index does not detail all available safety standards. Only titles published in 2015 and 2016 and those forthcoming in 2016 and 2017 are shown. For a full list, please visit the IAEA books website: *www.iaea.org/books* or email: *sales.publications@iaea.org*.

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| **IAEA Safety Standards Series No. GS-G-3.2** | **The Management System for Technical Services in Radiation Safety** | **31** |
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| IAEA Safety Standards Series No. SSG-16 | Establishing the Safety Infrastructure for a Nuclear Power Programme | R | 978-92-0-405614-3 | STI/PUB/1507 | 2015 | 40.00 |
| IAEA TECDOC Series No. 1733 | Evaluation of Advanced Thermohydraulic System Codes for Design and Safety Analysis of Integral Type Reactors | E | 978-92-0-100314-0 | IAEA-TECDOC-1733 | 2013 | 18.00 |
| IAEA TECDOC Series No. 1781 | Evaluation of Conditions for Hydrogen Induced Degradation of Zirconium Alloys during Fuel Operation and Storage | E | 978-92-0-110715-2 | IAEA-TECDOC-1781 | 2015 | 18.00 |
| IAEA TECDOC Series No. 1694 | Evaluation of High Temperature Gas Cooled Reactor Performance: Benchmark Analysis Related to the PBMR-400, PBMM, GT-MHR, HTR-10 and the ASTRA Critical Facility | E | 978-92-0-137610-7 | IAEA-TECDOC-1694 | 2013 | 32.00 |
| IAEA Safety Standards Series No. NS-G-2.13 | Evaluation of Seismic Safety for Existing Nuclear Installations | R | 978-92-0-401314-6 | STI/PUB/1379 | 2014 | 20.00 |
| IAEA Nuclear Energy Series No. NW-T-2.7 | Experiences and Lessons Learned Worldwide in the Cleanup and Decommissioning of Nuclear Facilities in the Aftermath of Accidents | E | 978-92-0-101214-2 | STI/PUB/1644 | 2014 | 31.00 |

| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
|---|---|---|---|---|---|---|
| Proceedings Series | Fast Reactors and Related Fuel Cycles: Safe Technologies and Sustainable Scenarios (FR13) Proceedings of an International Conference Held in Paris, France, 4–7 March 2013 2 volumes | E | 978-92-0-104114-2 | STI/PUB/1665 | 2015 | 98.00 |
| Technical Reports Series No. 478 | Feasibility of Producing Molybdenum-99 on a Small Scale Using Fission of Low Enriched Uranium or Neutron Activation of Natural Molybdenum | E | 978-92-0-114713-4 | STI/DOC/010/478 | 2015 | 44.00 |
| IAEA Nuclear Energy Series No. NW-T-1.5 | Framework and Challenges for Initiating Multinational Cooperation for the Development of a Radioactive Waste Repository | E | 978-92-0-111115-9 | STI/PUB/1722 | 2016 | 32.00 |
| IAEA Nuclear Energy Series No. NP-T-1.14 | Framework for Assessing Dynamic Nuclear Energy Systems for Sustainability : Final Report of the INPRO Collaborative Project GAINS | E | 978-92-0-140410-7 | STI/PUB/1598 | 2013 | 40.00 |
| IAEA TECDOC Series No. 1709 | Fuel Behaviour and Modelling under Severe Transient and Loss of Coolant Accident (LOCA) Conditions | E | 978-92-0-192410-0 | IAEA-TECDOC-CD-1709 | 2013 | 18.00 |
| IAEA TECDOC Series No. 1782 | Good Practice for Introducing Radiopharmaceuticals for Clinical Use | E | 978-92-0-111215-6 | IAEA-TECDOC-1782 | 2015 | 18.00 |
| IAEA Safety Standards Series No. GSR Part 1 (Rev. 1) | Governmental, Legal and Regulatory Framework for Safety | E | 978-92-0-108815-4 | STI/PUB/1713 | 2016 | 48.00 |
| Safety Reports Series No. 85 | Ground Motion Simulation Based on Fault Rupture Modelling for Seismic Hazard Assessment in Site Evaluation for Nuclear Installations | E | 978-92-0-102315-5 | STI/PUB/1689 | 2015 | 59.00 |
| IAEA Human Health Series No. 29 | Guided Intraoperative Scintigraphic Tumour Targeting (GOSTT) | E | 978-92-0-102214-1 | STI/PUB/1648 | 2014 | 75.00 |
| IAEA Radiation Technology Series No. 4 | Guidelines for Development, Validation and Routine Control of Industrial Radiation Processes | E | 978-92-0-135710-6 | STI/PUB/1581 | 2013 | 29.00 |
| Technical Reports Series No. 475 | Guidelines for Remediation Strategies to Reduce the Radiological Consequences of Environmental Contamination | E | 978-92-0-134110-5 | STI/DOC/010/475 | 2013 | 46.00 |
| IAEA TECDOC Series No. 1741 | Guidelines for Using Fallout Radionuclides to Assess Erosion and Effectiveness of Soil Conservation Strategies | E | 978-92-0-105414-2 | IAEA-TECDOC-1741 | 2014 | 18.00 |
| IAEA TECDOC Series No. 1741 | Guidelines for Using Fallout Radionuclides to Assess Erosion and Effectiveness of Soil Conservation Strategies | E | 978-92-0-155814-5 | IAEA-TECDOC-CD-1741 | 2014 | 18.00 |
| Technical Reports Series No. 479 | Handbook of Parameter Values for the Prediction of Radionuclide Transfer to Wildlife | E | 978-92-0-100714-8 | STI/DOC/010/479 | 2014 | 55.00 |
| IAEA TECDOC Series No. 1746 | Heat Transfer Behaviour and Thermohydraulics Code Testing for Supercritical Water Cooled Reactors (SCWRs) | E | 978-92-0-107614-4 | IAEA-TECDOC-1746 | 2014 | 18.00 |
| IAEA TECDOC Series No. 1693 | Hot Cell Post-irradiation Examination and Poolside Inspection of Nuclear Fuel | E | 978-92-0-191210-7 | IAEA-TECDOC-CD-1693 | 2013 | 18.00 |
| IAEA Nuclear Security Series No. 16 | Identification of Vital Areas at Nuclear Facilities | E | 978-92-0-114410-2 | STI/PUB/1505 | 2013 | 22.00 |

| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
|---|---|---|---|---|---|---|
| IAEA Nuclear Security Series No. 16 | Identification of Vital Areas at Nuclear Facilities | F | 978-92-0-210915-5 | STI/PUB/1505 | 2016 | 22.00 |
| Safety Reports Series No. 75 | Implementation of a Management System for Operating Organizations of Research Reactors | E | 978-92-0-136010-6 | STI/PUB/1584 | 2013 | 30.00 |
| IAEA Human Health Series No. 30 | Implementation of High Dose Rate Brachytherapy in Limited Resource Settings | E | 978-92-0-107214-6 | STI/PUB/1670 | 2015 | 45.00 |
| IAEA TECDOC Series No. 1731 | Implications for Occupational Radiation Protection of the New Dose Limit for the Lens of the Eye | E | 978-92-0-115213-8 | IAEA-TECDOC-1731 | 2013 | 18.00 |
| IAEA TECDOC Series No. 1697 | Improvement of Computer Codes Used for Fuel Behaviour Simulation (FUMEX-III) | E | 978-92-0-138610-6 | IAEA-TECDOC-1697 | 2013 | 18.00 |
| INSAG Series No. 23 | Improving the International System for Operating Experience Feedback | R | 978-92-0-408914-1 | STI/PUB/1349 | 2014 | 19.00 |
| INSAG Series No. 17 | Independence in Regulatory Decision Making | R | 978-92-0-409014-7 | STI/PUB/1172 | 2014 | 9.00 |
| IAEA Nuclear Energy Series No. NG-T-4.5 | Indicators for Nuclear Power Development | E | 978-92-0-107115-6 | STI/PUB/1712 | 2015 | 37.00 |
| IAEA TECDOC Series No. 1726 | In-pile Testing and Instrumentation for Development of Generation-IV Fuels and Materials | E | 978-92-0-164213-4 | IAEA-TECDOC-CD-1726 | 2013 | 18.00 |
| IAEA TECDOC Series No. 1716 | INPRO Assessment of the Planned Nuclear Energy System of Belarus | E | 978-92-0-113013-6 | IAEA-TECDOC-1716 | 2013 | 18.00 |
| IAEA Nuclear Energy Series No. NG-T-4.4 | INPRO Methodology for Sustainability Assessment of Nuclear Energy Systems: Economics | E | 978-92-0-102714-6 | STI/PUB/1653 | 2014 | 40.00 |
| IAEA Nuclear Energy Series No. NG-T-3.13 | INPRO Methodology for Sustainability Assessment of Nuclear Energy Systems: Environmental Impact from Depletion of Resources | E | 978-92-0-103415-1 | STI/PUB/1700 | 2015 | 33.00 |
| IAEA Nuclear Energy Series No. NG-T-3.12 | INPRO Methodology for Sustainability Assessment of Nuclear Energy Systems: Infrastructure | E | 978-92-0-106214-7 | STI/PUB/1668 | 2014 | 33.00 |
| IAEA Safety Standards Series No. SSG-37 | Instrumentation and Control Systems and Software Important to Safety for Research Reactors | E | 978-92-0-102615-6 | STI/PUB/1692 | 2015 | 41.00 |
| IAEA TECDOC Series No. 1706 | Instrumentation for Digital Nuclear Spectroscopy | E | 978-92-0-141310-9 | IAEA-TECDOC-1706 | 2013 | 18.00 |
| IAEA TECDOC Series No. 1708 | Integrated Approach to Dense Magnetized Plasmas Applications in Nuclear Fusion Technology | E | 978-92-0-142810-3 | IAEA-TECDOC-1708 | 2013 | 18.00 |
| IAEA TECDOC Series No. 1779 | Integrated Nuclear Infrastructure Review (INIR) Missions: The First Six Years | E | 978-92-0-110615-5 | IAEA-TECDOC-1779 | 2015 | 18.00 |
| IAEA TECDOC Series No. 1749 | International Conference on Topical Issues in Nuclear Installation Safety: Defence in Depth — Advances and Challenges for Nuclear Installation Safety Proceedings of an International Conference Held in Vienna, Austria, 21–24 October 2013 | E | 978-92-0-158214-0 | IAEA-TECDOC-CD-1749 | 2014 | 18.00 |

| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
|---|---|---|---|---|---|---|
| IAEA Nuclear Energy Series No. NP-T-2.8 | International Safeguards in Nuclear Facility Design and Construction | E | 978-92-0-140610-1 | STI/PUB/1600 | 2013 | 19.00 |
| IAEA Nuclear Energy Series No. NP-T-2.9 | International Safeguards in the Design of Nuclear Reactors | E | 978-92-0-106514-8 | STI/PUB/1669 | 2014 | 30.00 |
| IAEA Human Health Series No. 12 | Introduction to Body Composition Assessment Using the Deuterium Dilution Technique with Analysis of Saliva Samples by Fourier Transform Infrared Spectrometry | F | 978-92-0-214513-9 | STI/PUB/1450 | 2013 | 37.00 |
| IAEA Human Health Series No. 12 | Introduction to Body Composition Assessment Using the Deuterium Dilution Technique with Analysis of Saliva Samples by Fourier Transform Infrared Spectrometry | S | 978-92-0-314013-3 | STI/PUB/1450 | 2013 | 37.00 |
| IAEA Human Health Series No. 13 | Introduction to Body Composition Assessment Using the Deuterium Dilution Technique with Analysis of Urine Samples by Isotope Ratio Mass Spectrometry | F | 978-92-0-214113-1 | STI/PUB/1451 | 2013 | 36.00 |
| IAEA Human Health Series No. 13 | Introduction to Body Composition Assessment Using the Deuterium Dilution Technique with Analysis of Urine Samples by Isotope Ratio Mass Spectrometry | S | 978-92-0-313913-7 | STI/PUB/1451 | 2013 | 36.00 |
| IAEA TECDOC Series No. 1776 | Inventory of Radioactive Material Resulting from Historical Dumping, Accidents and Losses at Sea | E | 978-92-0-109015-7 | IAEA-TECDOC-1776 | 2015 | 18.00 |
| | Isotope Methods for Dating Old Groundwater | E | 978-92-0-137210-9 | STI/PUB/1587 | 2013 | 70.00 |
| Proceedings Series | Isotopes in Hydrology, Marine Ecosystems and Climate Change Studies Proceedings of the International Symposium Held in Monaco, 27 March–1 April 2011 2 volumes | E | 978-92-0-135610-9 | STI/PUB/1580 | 2013 | 90.00 |
| IAEA Safety Standards Series No. GSG-5 | Justification of Practices, Including Non-medical Human Imaging | E | 978-92-0-102414-5 | STI/PUB/1650 | 2014 | 32.00 |
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| IAEA Nuclear Energy Series No. NG-T-6.10 | Knowledge Management and Its Implementation in Nuclear Organizations | E | 978-92-0-107215-3 | STI/PUB/1724 | 2016 | 31.00 |
| IAEA Nuclear Energy Series No. NG-T-3.5 | Legal and Institutional Issues of Transportable Nuclear Power Plants: A Preliminary Study | E | 978-92-0-144710-4 | STI/PUB/1624 | 2013 | 33.00 |
| IAEA Nuclear Energy Series No. NW-T-3.6 | Lessons Learned from Environmental Remediation Programmes | E | 978-92-0-145310-5 | STI/PUB/1630 | 2014 | 27.00 |
| | Library of Recommended Actinide Decay Data, 2011 | E | 978-92-0-143910-9 | STI/PUB/1618 | 2013 | 60.00 |
| INSAG Series No. 16 | Maintaining Knowledge, Training and Infrastructure for Research and Development in Nuclear Safety | R | 978-92-0-406615-9 | STI/PUB/1179 | 2015 | 9.00 |
| INSAG Series No. 19 | Maintaining the Design Integrity of Nuclear Installations Throughout Their Operating Life | R | 978-92-0-404315-0 | STI/PUB/1178 | 2015 | 9.00 |

| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
|---|---|---|---|---|---|---|
| IAEA TECDOC Series No. 1784 | Management and Area-wide Evaluation of Water Conservation Zones in Agricultural Catchments for Biomass Production, Water Quality and Food Security | E | 978-92-0-100516-8 | IAEA-TECDOC-1784 | 2016 | 18.00 |
| Proceedings Series | Management and Storage of Research Reactor Spent Nuclear Fuel Proceedings of a Technical Meeting Held in Thurso, United Kingdom, 19–22 October 2009 | E | 978-92-0-138210-8 | STI/PUB/1592 | 2013 | 49.00 |
| IAEA Human Health Reports No. 6 | Management of Cervical Cancer: Strategies for Limited-resource Centres — A Guide for Radiation Oncologists | E | 978-92-0-128810-3 | STI/PUB/1556 | 2013 | 18.00 |
| IAEA TECDOC Series No. 1714 | Management of Discharge of Low Level Liquid Radioactive Waste Generated in Medical, Educational, Research and Industrial Facilities | E | 978-92-0-143510-1 | IAEA-TECDOC-1714 | 2013 | 18.00 |
| IAEA Nuclear Energy Series No. NW-T-1.3 | Management of Disused Sealed Radioactive Sources | E | 978-92-0-103214-0 | STI/PUB/1657 | 2014 | 46.00 |
| IAEA TECDOC Series No. 1712 | Management of NORM Residues | E | 978-92-0-142710-6 | IAEA-TECDOC-1712 | 2013 | 18.00 |
| INSAG Series No. 13 | Management of Operational Safety in Nuclear Power Plants | R | 978-92-0-401215-6 | STI/PUB/1083 | 2015 | 14.50 |
| Proceedings Series | Management of Spent Fuel from Nuclear Power Reactors Proceedings of an International Conference Held in Vienna, Austria, 31 May–4 June 2010 | E | 978-92-0-103714-5 | STI/PUB/1661 | 2015 | 40.00 |
| INSAG Series No. 18 | Managing Change in the Nuclear Industry: The Effects on Safety | R | 978-92-0-408015-5 | STI/PUB/1173 | 2015 | 9.00 |
| IAEA Nuclear Energy Series No. NG-T-3.11 | Managing Environmental Impact Assessment for Construction and Operation in New Nuclear Power Programmes | E | 978-92-0-144810-1 | STI/PUB/1625 | 2014 | 29.00 |
| IAEA Nuclear Energy Series No. NG-T-2.7 | Managing Human Performance to Improve Nuclear Facility Operation | E | 978-92-0-144610-7 | STI/PUB/1623 | 2014 | 18.00 |
| IAEA Nuclear Energy Series No. NG-T-1.1 | Managing Organizational Change in Nuclear Organizations | E | 978-92-0-140910-2 | STI/PUB/1603 | 2014 | 45.00 |
| Safety Reports Series No. 79 | Managing Regulatory Body Competence | E | 978-92-0-113413-4 | STI/PUB/1635 | 2014 | 44.00 |
| IAEA Nuclear Energy Series No. NW-T-2.8 | Managing the Unexpected in Decommissioning | E | 978-92-0-103615-5 | STI/PUB/1702 | 2016 | 35.00 |
| Technical Reports Series No. 481 | Manual of Good Practice in Food Irradiation | E | 978-92-0-105215-5 | STI/DOC/010/481 | 2015 | 48.00 |
| Technical Reports Series No. 474 | Measurement and Calculation of Radon Releases from NORM Residues | E | 978-92-0-142610-9 | STI/DOC/010/474 | 2013 | 34.00 |
| IAEA TECDOC Series No. 1777 | Methodology for Safety Assessment Applied to Predisposal Waste Management | E | 978-92-0-109215-1 | IAEA-TECDOC-1777 | 2015 | 18.00 |
| IAEA TECDOC Series No. 1757 | Methodology for the Systematic Assessment of the Regulatory Competence Needs (SARCoN) for Regulatory Bodies of Nuclear Installations | E | 978-92-0-110514-1 | IAEA-TECDOC-1757 | 2014 | 18.00 |

| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
|---|---|---|---|---|---|---|
| IAEA Nuclear Energy Series No. NG-G-3.1 (Rev. 1) | Milestones in the Development of a National Infrastructure for Nuclear Power | E | 978-92-0-104715-1 | STI/PUB/1704 | 2015 | 40.00 |
| IAEA Nuclear Energy Series No. NW-T-1.8 | Mobile Processing Systems for Radioactive Waste Management | E | 978-92-0-141010-8 | STI/PUB/1621 | 2014 | 38.00 |
| IAEA TECDOC Series No. 1732 | Model Regulations for the Use of Radiation Sources and for the Management of the Associated Radioactive Waste | E | 978-92-0-115613-6 | IAEA-TECDOC-1732 | 2013 | 18.00 |
| IAEA TECDOC Series No. 1732 | Model Regulations for the Use of Radiation Sources and for the Management of the Associated Radioactive Waste | A | 978-92-0-603516-0 | IAEA-TECDOC-1732 | 2015 | 18.00 |
| IAEA TECDOC Series No. 1732 | Model Regulations for the Use of Radiation Sources and for the Management of the Associated Radioactive Waste | S | 978-92-0-300915-7 | IAEA-TECDOC-1732 | 2015 | 18.00 |
| IAEA Nuclear Energy Series No. NG-T-5.2 | Modelling Nuclear Energy Systems with MESSAGE: A User's Guide | E | 978-92-0-109715-6 | STI/PUB/1718 | 2016 | 39.00 |
| IAEA TECDOC Series No. 1737 | Modelling of Biota Dose Effects | E | 978-92-0-101114-5 | IAEA-TECDOC-1737 | 2014 | 18.00 |
| IAEA TECDOC Series No. 1775 | Modelling of Water Cooled Fuel Including Design Basis and Severe Accidents | E | 978-92-0-158615-5 | IAEA-TECDOC-CD-1775 | 2015 | 18.00 |
| IAEA Nuclear Energy Series No. NW-T-1.4 | Modular Design of Processing and Storage Facilities for Small Volumes of Low and Intermediate Level Radioactive Waste including Disused Sealed Sources | E | 978-92-0-145110-1 | STI/PUB/1628 | 2014 | 55.00 |
| IAEA Safety Standards Series No. SSG-31 | Monitoring and Surveillance of Radioactive Waste Disposal Facilities | E | 978-92-0-115513-9 | STI/PUB/1640 | 2014 | 40.00 |
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| IAEA Safety Standards Series No. SSG-19 | National Strategy for Regaining Control over Orphan Sources and Improving Control over Vulnerable Sources | S | 978-92-0-337110-0 | STI/PUB/1510 | 2013 | 35.00 |
| IAEA Safety Standards Series No. SSG-19 | National Strategy for Regaining Control over Orphan Sources and Improving Control over Vulnerable Sources | F | 978-92-0-210314-6 | STI/PUB/1510 | 2015 | 35.00 |
| Proceedings Series | Naturally Occurring Radioactive Material (NORM VII) Proceedings of an International Symposium Held in Beijing, China, 22–26 April 2013 | E | 978-92-0-104014-5 | STI/PUB/1664 | 2015 | 95.00 |
| IAEA Safety Standards Series No. SSG-29 | Near Surface Disposal Facilities for Radioactive Waste | E | 978-92-0-114313-6 | STI/PUB/1637 | 2014 | 36.00 |
| IAEA TECDOC Series No. 1753 | New Technologies for Seawater Desalination Using Nuclear Energy | E | 978-92-0-100115-3 | IAEA-TECDOC-1753 | 2015 | 18.00 |
| IAEA Nuclear Energy Series No. NF-T-5.4 | Non-HEU Production Technologies for Molybdenum-99 and Technetium-99m | E | 978-92-0-137710-4 | STI/PUB/1589 | 2013 | 24.00 |
| IAEA Nuclear Energy Series No. NG-T-6.8 | Nuclear Accident Knowledge Taxonomy | E | 978-92-0-101416-0 | STI/PUB/1730 | 2016 | 28.00 |

| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
|---|---|---|---|---|---|---|
| IAEA Nuclear Energy Series No. NG-T-6.4 | Nuclear Engineering Education: A Competence Based Approach to Curricula Development | E | 978-92-0-144910-8 | STI/PUB/1626 | 2014 | 20.00 |
| IAEA Nuclear Security Series No. 2-G (Rev. 1) | Nuclear Forensics in Support of Investigations | E | 978-92-0-102115-1 | STI/PUB/1687 | 2015 | 38.00 |
| IAEA Nuclear Energy Series No. NF-O | Nuclear Fuel Cycle Objectives | E | 978-92-0-144510-0 | STI/PUB/1622 | 2013 | 21.00 |
| | Nuclear Medicine Physics | E | 978-92-0-143810-2 | STI/PUB/1617 | 2015 | 105.00 |
| IAEA TECDOC Series No. 1778 | Nuclear Power in Countries with Limited Electrical Grid Capacities: The Case of Armenia | E | 978-92-0-110415-1 | IAEA-TECDOC-1778 | 2015 | 18.00 |
| Reference Data Series No. 2 | Nuclear Power Reactors in the World 2013 Edition | E | 978-92-0-144110-2 | IAEA-RDS-2/33 | 2013 | 15.00 |
| Reference Data Series No. 2 | Nuclear Power Reactors in the World 2014 Edition | E | 978-92-0-104914-8 | IAEA-RDS-2/34 | 2014 | 15.00 |
| Reference Data Series No. 2 | Nuclear Power Reactors in the World 2015 Edition | E | 978-92-0-104915-5 | IAEA-RDS-2/35 | 2015 | 15.00 |
| Reference Data Series No. 2 | Nuclear Power Reactors in the World 2016 Edition | E | 978-92-0-103716-9 | IAEA-RDS-2/36 | 2016 | 15.00 |
| IAEA Nuclear Energy Series No. NP-T-1.10 | Nuclear Reactor Technology Assessment for Near Term Deployment | E | 978-92-0-140310-0 | STI/PUB/1597 | 2013 | 30.00 |
| INSAG Series No. 22 | Nuclear Safety Infrastructure for a National Nuclear Power Programme Supported by the IAEA Fundamental Safety Principles | R | 978-92-0-406714-9 | STI/PUB/1350 | 2014 | 20.00 |
| | Nuclear Security in the Uranium Extraction Industry | E | 978-92-0-110815-9 | IAEA-TDL-003 | 2016 | 18.00 |
| | Nuclear Security Management for Research Reactors and Related Facilities | E | 978-92-0-111315-3 | IAEA-TDL-004 | 2016 | 18.00 |
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| IAEA Nuclear Security Series No. 21 | Nuclear Security Systems and Measures for the Detection of Nuclear and Other Radioactive Material out of Regulatory Control | A | 978-92-0-605515-1 | STI/PUB/1613 | 2015 | 30.00 |
| Proceedings Series | Nuclear Security: Enhancing Global Efforts Proceedings of an International Conference Held in Vienna, Austria, 1–5 July 2013 | E | 978-92-0-101514-3 | STI/PUB/1643 | 2014 | 90.00 |
| IAEA Nuclear Security Series No. 20 | Objective and Essential Elements of a State's Nuclear Security Regime | E | 978-92-0-137810-1 | STI/PUB/1590 | 2013 | 20.00 |
| IAEA Nuclear Security Series No. 20 | Objective and Essential Elements of a State's Nuclear Security Regime | A | 978-92-0-606114-5 | STI/PUB/1590 | 2014 | 20.00 |
| IAEA Nuclear Security Series No. 20 | Objective and Essential Elements of a State's Nuclear Security Regime | C | 978-92-0-505514-5 | STI/PUB/1590 | 2014 | 20.00 |

| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
|---|---|---|---|---|---|---|
| IAEA Nuclear Security Series No. 20 | Objective and Essential Elements of a State's Nuclear Security Regime | F | 978-92-0-205714-2 | STI/PUB/1590 | 2014 | 20.00 |
| IAEA Nuclear Security Series No. 20 | Objective and Essential Elements of a State's Nuclear Security Regime | R | 978-92-0-404814-8 | STI/PUB/1590 | 2014 | 20.00 |
| IAEA Nuclear Security Series No. 20 | Objective and Essential Elements of a State's Nuclear Security Regime | S | 978-92-0-307014-0 | STI/PUB/1590 | 2014 | 20.00 |
| IAEA TECDOC Series No. 1762 | Operating Experience from Events Reported to the IAEA Incident Reporting System for Research Reactors | E | 978-92-0-100615-8 | IAEA-TECDOC-1762 | 2015 | 18.00 |
| | Operating Experience with Nuclear Power Stations in Member States in 2012 (CD-ROM) | E | 978-92-0-194310-1 | STI/PUB/1620 | 2013 | 65.00 |
| | Operating Experience with Nuclear Power Stations in Member States in 2013 (CD-ROM) | E | 978-92-0-157314-8 | STI/PUB/1671 | 2014 | 75.00 |
| | Operating Experience with Nuclear Power Stations in Member States in 2014 (CD-ROM) | E | 978-92-0-155015-6 | STI/PUB/1707 | 2015 | 75.00 |
| IAEA TECDOC Series No. 1720 | Operation and Licensing of Mixed Cores in Water Cooled Reactors | E | 978-92-0-113213-0 | IAEA-TECDOC-1720 | 2013 | 18.00 |
| IAEA TECDOC Series No. 1721 | Optimizing Productivity of Food Crop Genotypes in Low Nutrient Soils | E | 978-92-0-113113-3 | IAEA-TECDOC-1721 | 2014 | 18.00 |
| IAEA TECDOC Series No. 1721 | Optimizing Productivity of Food Crop Genotypes in Low Nutrient Soils | E | 978-92-0-165313-0 | IAEA-TECDOC-CD-1721 | 2013 | 18.00 |
| IAEA Nuclear Energy Series No. NW-T-1.24 | Options for Management of Spent Fuel and Radioactive Waste for Countries Developing New Nuclear Power Programmes | E | 978-92-0-140710-8 | STI/PUB/1601 | 2013 | 23.00 |
| IAEA Nuclear Energy Series No. NP-T-1.11 | Options to Enhance Proliferation Resistance of Innovative Small and Medium Sized Reactors | E | 978-92-0-145510-9 | STI/PUB/1632 | 2014 | 28.00 |
| IAEA Nuclear Energy Series No. NW-T-3.4 | Overcoming Barriers in the Implementation of Environmental Remediation Projects | E | 978-92-0-140810-5 | STI/PUB/1602 | 2013 | 24.00 |
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| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
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| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
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| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
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| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
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| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
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| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
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| Series & No. | Title | Language | ISBN | Symbol | Published | PriceEuro |
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