
IAEA
International Atomic Energy Agency
IAEA Publications
Catalogue
2020–2021

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Marketing and Sales Unit
Publishing Section
International Atomic Energy Agency
Vienna International Centre, P.O. Box 100
1400 Vienna, Austria
Email: sales.publications@iaea.org
Tel.: +43 1 2600 22529/22530
Fax: +43 1 26007 22529
Web site: www.iaea.org/publications

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This publications catalogue lists all sales publications of the IAEA published in 2018–2020 and those forthcoming in 2021.
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
CD-ROM format

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www.iaea.org/publications

Images

Please note that the images included in this catalogue illustrate the work of the IAEA, but they may not necessarily reflect the work presented in the publication next to which they are placed.

INTRODUCTION

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.

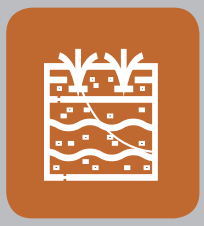
Key publications include the IAEA Safety Standards, which detail the principles of safety for protection against ionizing radiation, and Safety Reports, which describe good practices and give practical examples and detailed methods that can be used to meet safety requirements.

HUMAN HEALTH

Nuclear Medicine (including Radiopharmaceuticals), Medical Physics, Dosimetry and Diagnosis, Radiotherapy, Nutrition

FOOD AND AGRICULTURE

Soil Fertility and Irrigation, Animal Production



EARTH SCIENCES

Uranium Geology, Exploration and Mining, Hydrology

NUCLEAR SECURITY

NUCLEAR POWER

Nuclear Power Planning and Economics, Nuclear Power Operations, Reactor Technology, Quality Assurance, Qualification and Training of Personnel

NUCLEAR FUEL CYCLE AND WASTE MANAGEMENT

Uranium Ore Processing, Fuel Fabrication and Performance, Spent Fuel Management, Waste Management

NUCLEAR MEASUREMENT TECHNIQUES AND INSTRUMENTATION

Physics, Nuclear Analytical Techniques, Research Reactors and Particle Accelerators (Applications)

NUCLEAR AND RADIATION SAFETY

Uranium Mining and Milling, Fuel Fabrication and Storage, Nuclear Power Plants, Research Reactors, Radiation Sources and Accelerators, Transport of Radioactive Material, Fusion Reactors, Waste Repositories, Radiation Protection, Accident Response, Radioactive Waste Management, Safety Assessment, Legal and Governmental Aspects

INDUSTRIAL APPLICATIONS

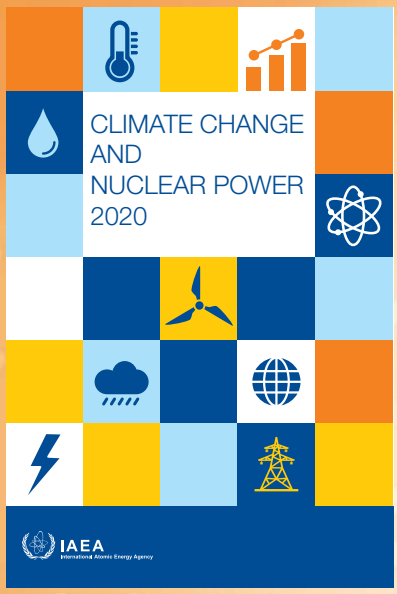
PLASMA PHYSICS AND NUCLEAR FUSION

SAFEGUARDS

NUCLEAR LAW

ENVIRONMENT

Climate Change and Nuclear Power 2020



This publication provides an update on the current status of nuclear power and prospects for its contribution, together with other low carbon energy sources, to ambitious mitigation strategies that will help the world limit global warming to 1.5°C in line with the 2015 Paris Agreement. Since 2000, the IAEA has issued such information and analysis regularly, in order to support those Member States that choose to include nuclear power in their energy system as well as those considering other strategies. The focus of the 2020 publication is on the significant potential of nuclear energy, integrated in a low carbon energy system, to contribute to the 1.5°C climate change mitigation target, and the challenges of realizing this potential. Energy system and market related factors affecting the transition to a low carbon energy system are reviewed. This edition also outlines developments needed to realize the large scale capacity increase required to rapidly decarbonize the global energy system in line with limiting global warming to 1.5°C.

English (108 pp., 34 figs; 2020) |
ISBN 978-92-0-115020-2 | STI/PUB/1911 | €28.00

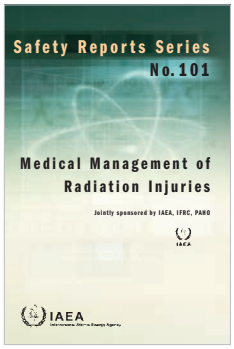
Nuclear Medicine (including
Radiopharmaceuticals),
Medical Physics,
Dosimetry and Diagnosis,
Radiotherapy,
Nutrition

HUMAN HEALTH


ED HLA
ES HLA
ED VLA
ES VLA
Perfusion
LAD
ED Perfusion
Wall Thickening
Wall Motion

Medical Management of Radiation Injuries

Safety Reports Series No. 101



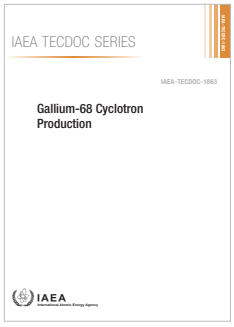
This publication focuses on the medical management of individuals involved in radiation emergencies, especially those who have been exposed to high doses of ionizing radiation. Its primary objective is to provide practical information, to be used for treatment decisions by medical personnel during a radiation emergency. It also addresses general and specific measures for the medical management of individuals who have been internally contaminated with radionuclides. This publication is complementary to other publications developed by the IAEA in the medical area of radiation emergencies.

English (98 pp., 13 figs; 2020) | ISBN 978-92-0-107019-7 | STI/PUB/1891 | €57.00

NUCLEAR MEDICINE (INCLUDING RADIOPHARMACEUTICALS)

Gallium-68 Cyclotron Production

IAEA TECDOC Series No. 1863



This publication provides a comprehensive overview of the technologies involved in the direct production of gallium-68. It serves as a specific guide for the production and quality control of metal radioisotope gallium-68 in chloride form for radiopharmaceutical production. Emphasis is given to the advances developed over the past few years. The publication, which also describes the legal matters related to the use of the targetry methods, will appeal to scientists and technologists intending to put cyclotron based radioisotope production into practice, as well as postgraduate students in the field.

English (66 pp., 18 figs; 2019) | ISBN 978-92-0-100819-0 | IAEA-TECDOC-1863 | €18.00

Nuclear Medicine Resources Manual 2020 Edition

IAEA Human Health Series No. 37

Medical imaging is crucial in a variety of medical settings and at all levels of health care. In public health and preventive medicine as well as in both curative and palliative care, effective decisions depend on correct diagnoses. This edition addresses the most current needs and offers guidance on clinical practice, radiation safety and patient protection, human resource development and training required for the overall practice of nuclear medicine.

English (Forthcoming) | **ISBN 978-92-0-104019-0** | **STI/PUB/1861** | **€70.00**

Quality Control in the Production of Radiopharmaceuticals

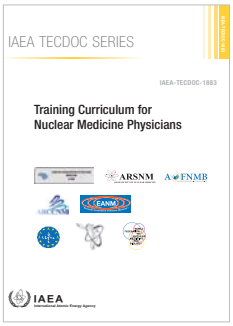
IAEA TECDOC Series No. 1856

Advances have led to the production of new radiopharmaceuticals and availability of new production routes. Various new diagnostic agents in the field (such as Ga-68 radiopharmaceuticals and generators) as well as therapeutic agents (such as alpha emitters) have been added to the clinician's menu. It is essential that radiopharmaceuticals are prepared within a robust quality control system encompassing materials and personnel, with adequate documentation, and continuous review of ongoing results. This publication provides guidelines and best practices for the quality control of medical radioisotopes and radiopharmaceuticals. It was written by a group of experts with experience across a range of radiopharmaceuticals and is intended to support professionals in the preparation of good quality and safe products to be used in nuclear medicine procedures.

English (148 pp., 5 figs; 2018) | **ISBN 978-92-0-107918-3** | **IAEA-TECDOC-1856** | **€18.00**

Training Curriculum for Nuclear Medicine Physicians

IAEA TECDOC Series No. 1883

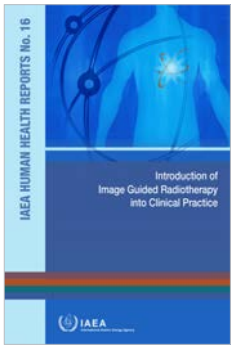


This publication addresses the different components in which any well trained nuclear medicine physician must be competent. It stresses the importance of providing support for the implementation of the prescribed programme, thus meeting the individual needs of trainees. Likewise, it emphasizes the appropriate duration of training necessary to acquire the competencies needed to provide adequate care to patients and ensure the safety and quality of clinical practice. Moreover, the principles and practice of physics, radiochemistry, anatomy, physiology and clinical nuclear medicine, including hybrid imaging are discussed.

English (58 pp; 2019) | **ISBN 978-92-0-160219-0** | **IAEA-TECDOC-1883** | **€18.00**

Introduction of Image Guided Radiotherapy into Clinical Practice

IAEA Human Health Reports No. 16

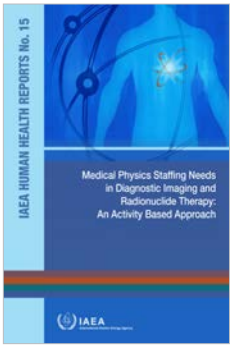


This publication provides guidelines and highlights the milestones to be achieved by radiotherapy departments in the safe and effective introduction of image guided radiotherapy. Recent advances in external beam radiotherapy include the technology to image the patient in the treatment position, in the treatment room at the time of treatment. Since this technology and associated image techniques, termed image guided radiotherapy, are perceived as the cutting-edge of development in the field of radiotherapy, this publication addresses the concerns of personnel in radiotherapy departments as to the preparatory conditions and resources involved in implementation. Information is also presented on the current status of the evidence supporting the use of image guided radiotherapy in terms of patient outcomes.

English (39 pp., 6 figs; 2019) | ISBN 978-92-0-103218-8 | STI/PUB/1827 | €31.00

Medical Physics Staffing Needs in Diagnostic Imaging and Radionuclide Therapy: An Activity Based Approach

IAEA Human Health Reports No. 15



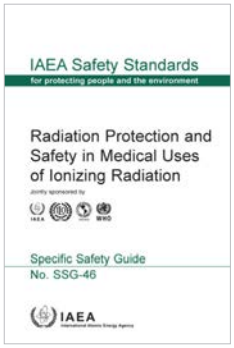
Over the past few decades the rapid technological development of diagnostic and interventional radiology and nuclear medicine has made them major tools of modern medicine. However, at the same time the involved risks, the growing number of procedures and the increasing complexity of the procedures require competent professional staff to ensure safe and effective patient diagnosis, treatment and management. Medical physicists (or clinically qualified medical physicists) have been recognized as vital health professionals with important and clear responsibilities related to quality and safety of applications of ionizing radiation in medicine. This publication describes an algorithm developed to determine the recommended staffing levels for clinical medical physics services in medical imaging and radionuclide therapy, based on current best practice, as described in international guidelines.

English (23 pp.; 2018) | ISBN 978-92-0-107817-9 | STI/PUB/1797 | €20.00

Radiation Protection and Safety in Medical Uses of Ionizing Radiation

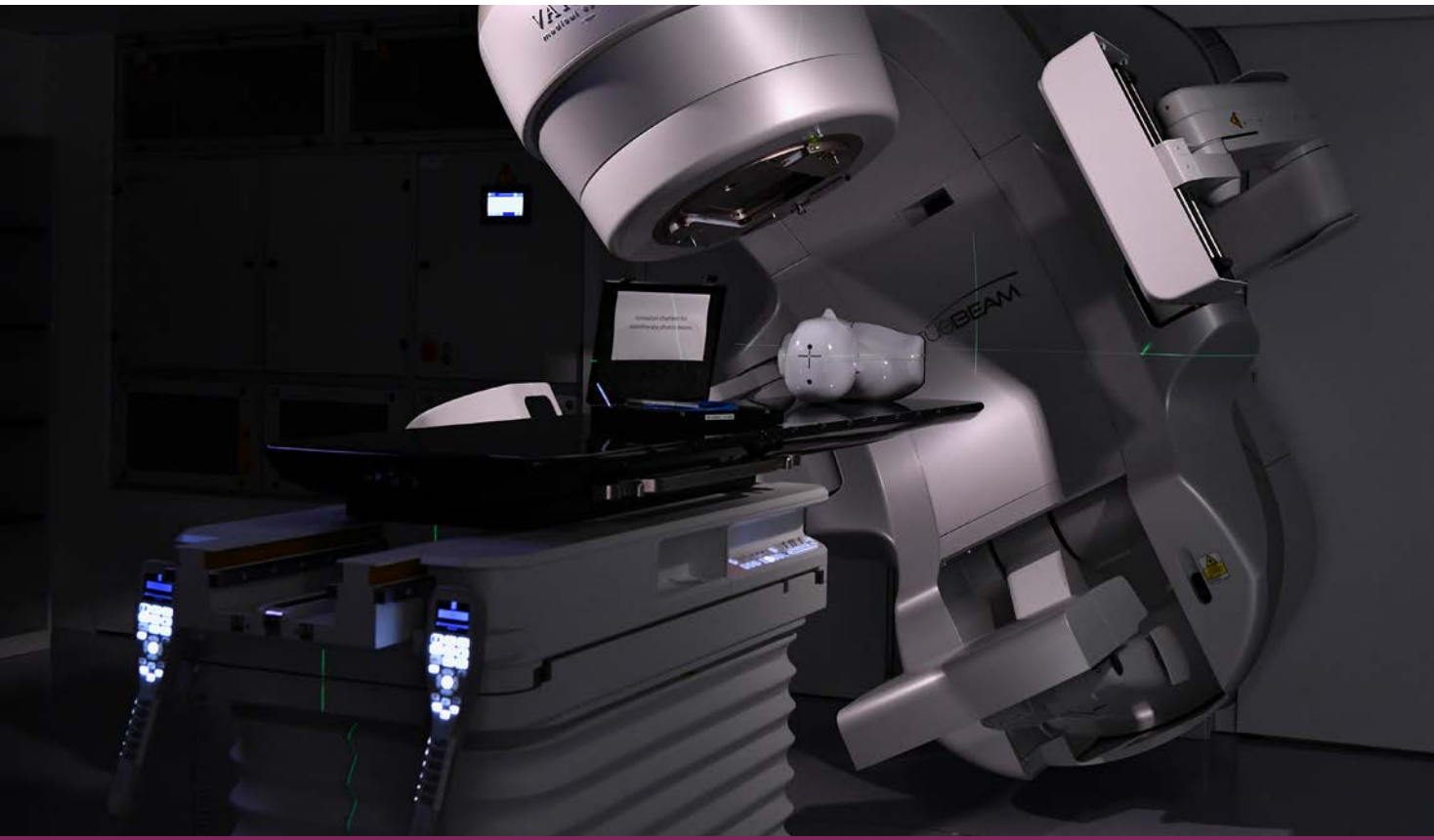
Specific Safety Guide

IAEA Safety Standards Series No. SSG-46



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

English (318 pp., 2 figs; 2018) | ISBN 978-92-0-101717-8 | STI/PUB/1775 | €54.00



SPECT/CT Atlas of Quality Control and Image Artefacts

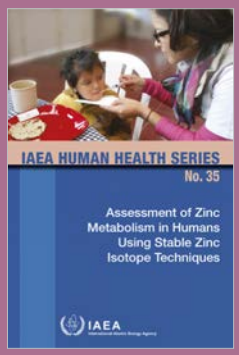
IAEA Human Health Series No. 36

Multi-modality imaging has become increasingly prevalent in nuclear medicine and diagnostic radiology. To accurately interpret single photon emission computed tomography/computed tomography (SPECT/CT) images in addition to understanding the principles of image formation and the biological distribution of the radiopharmaceutical, it is important to understand the image artefacts that can arise from these imaging systems. This atlas presents an overview of quality control procedures in SPECT and SPECT/CT and guides the reader through pitfalls and image artefacts that can be faced using these imaging modalities. In addition to examples of artefacts themselves, descriptions are given on their causes, and the steps that can be taken to avoid their recurrence. The atlas is intended to be used as a guide for nuclear medicine and diagnostic radiology professionals (medical physicists, nuclear medicine physicians, radiologists, medical radiation technologists and service engineers) on how to take appropriate quality control measures, and to assist with problem analyses and prevention.

English (127 pp., 138 figs; 2019) | ISBN 978-92-0-103919-4 | STI/PUB/1860 | €65.00

Assessment of Zinc Metabolism in Humans Using Stable Zinc Isotope Techniques

IAEA Human Health Series No. 35



This publication is part of the IAEA's continuing efforts to transfer technology and to contribute to capacity building by providing information on the theoretical background and practical application of state of the art methodologies for assessing human zinc metabolism to better understand absorption, dietary bioavailability and nutritional requirements. It reviews the role of zinc in human nutrition and the application of stable isotope techniques to evaluate nutritional interventions. Information is given on planning a study, administering isotopes, preparing and analysing samples, and calculating physiological end points. The publication was developed with input from international experts and is intended for nutritionists, analytical chemists and other professionals interested in the application of stable isotope techniques to evaluate human zinc nutrition and metabolism.

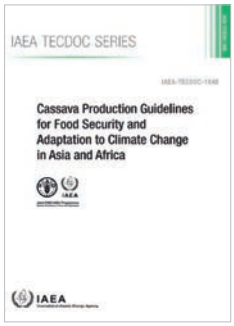
English (115 pp., 14 figs; 2018) I ISBN 978-92-0-108418-7 I STI/PUB/1835 I €51.00

Soil Fertility and Irrigation,
Animal Production

FOOD AND AGRICULTURE

Cassava Production Guidelines for Food Security and Adaption to Climate Change in Asia and Africa

IAEA TECDOC Series No. 1840

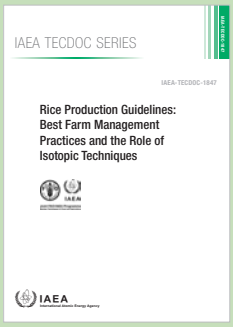


Cassava is the third largest source of human food and animal feed carbohydrates in the tropics, after maize and rice. It is a major food crop in Africa and is also grown in a number of countries in Asia. However, declining soil fertility and poor farming practices are serious problems for traditional cassava farms in both Asia and Africa. This publication is intended to assist Member States in enhancing their cassava production. It provides information on the best farm management practices and the role of nuclear and isotopic techniques to better understand nutrient nitrogen (N) uptake. The guidelines presented in the publication provide an integrated and crop-need-based nutrient, weed, insect pest and disease management plan for growing cassava. By using these improved crop management methods, farmers can optimize cassava yields and minimize production costs. They also contribute to a reduction in land degradation by soil erosion, particularly on sloping lands, thereby protecting the local environment. The intended end result is an enhancement of the quality and market value of cassava products.

English (68 pp., 23 figs; 2018) | ISBN 978-92-0-101718-5 | IAEA-TECDOC-1840 | €18.00

Rice Production Guidelines: Best Farm Management Practices and the Role of Isotopic Techniques

IAEA TECDOC Series No. 1847

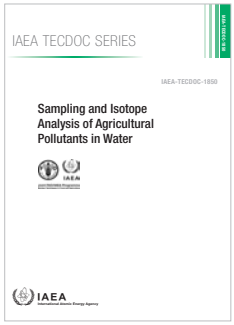


This publication is intended to enhance rice production and provides information on best management practices. The role of isotopic techniques to quantify nitrogen use efficiency is addressed and information presented to support a better understanding of the pathways of greenhouse gases emission. The publication informs the reader on improved rice varieties and sustainable cultivation practices from a wide range of Asian countries. This will enable national research and development staff to select and test these varieties and practices in farmers' fields to promote improved rice varieties and crop management practices in their respective countries. By using these improved crop management methods, farmers can improve the productivity and profitability of rice crops through the adoption of locally adapted 'best' rice varieties, thereby protecting the local environment.

English (132 pp., 51 figs; 2018) | ISBN 978-92-0-103418-2 | IAEA-TECDOC-1847 | €18.00

Sampling and Isotope Analysis of Agricultural Pollutants in Water

IAEA TECDOC Series No. 1850



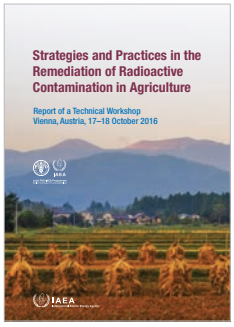
Stable isotope techniques can help identify the sources of water pollution associated with agricultural activities. Knowing the origin of nutrients or contaminants is essential to improve agricultural practices. To ensure the quality of stable isotope analysis, appropriate sampling and sample preparation are crucial. This publication presents methods for surface water sampling and sample processing through micro-diffusion and bacterial denitrification combined with laser spectroscopy. Information on such methods is often described in a summarized and non-comprehensive way, without proper illustration of every step. This publication aims to bridge this gap for scientists, technicians and students. It presents a selection of standard operating procedures providing guidance in water sampling and sample preparation that are mandatory when conducting reliable isotope analysis on water.

English (59 pp., 13 figs; 2018) | ISBN 978-92-0-105018-2 | IAEA-TECDOC-1850 | €18.00

Strategies and Practices in the Remediation of Radioactive Contamination in Agriculture

Report of a Technical Workshop Held in Vienna, Austria, 17–18 October 2016

Proceedings Series

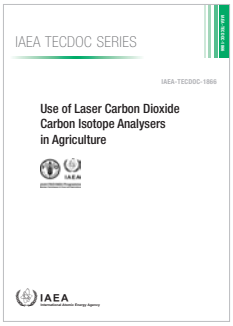


This publication presents the proceedings of a workshop on the remediation of radioactive contamination in agriculture. The workshop brought together specialists from different countries and technical backgrounds and sought to disseminate research findings and encourage future studies aimed at the development of technologies to support sustainable agricultural production and rural development after a nuclear accident. The presentations and discussions at the meeting focused on both laboratory findings and practical field-work experience in planning and implementing remediation activities. The participants provided information related to agricultural production in Japan after the Fukushima Daiichi accident and in the many different countries affected by the Chernobyl accident. The workshop contributed to the dissemination of information and knowledge in this very distinct area and produced conclusions, recommendations and observations to enhance preparedness and response planning for nuclear emergencies and radiological incidents in relation to food and agriculture. This publication is targeted at authorities responsible for food and agriculture, international organizations working in this area, as well as professionals and academics involved in the remediation of radioactive contamination. It will also be of interest to nuclear safety or emergency planning and response specialists.

English (194 pp., 31 figs; 2020) | ISBN 978-92-0-102120-5 | STI/PUB/1904 | €50.00

Use of Laser Carbon Dioxide Carbon Isotope Analysers in Agriculture

IAEA TECDOC Series No. 1866

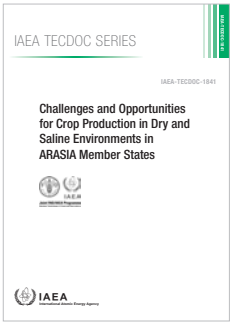


This publication provides information on monitoring and tracking carbon dioxide in the atmosphere or emissions from soil and plant materials using a laser carbon dioxide carbon isotope analyser. Through illustrated step-by-step standard operating procedures, this publication assists scientists, technicians and students in techniques ranging from initial calibration of the instrument to collecting measurements and analysing data. When accurately utilized, this instrumentation can ensure proper evaluation of agricultural management practices to reduce soil carbon dioxide emissions and promote climate-smart agriculture. The final chapter of this publication also presents a case study that demonstrates how this instrumentation can be used.

English (44 pp., 8 figs; 2019) | ISBN 978-92-0-101419-1 | IAEA-TECDOC-1866 | €18.00

Challenges and Opportunities for Crop Production in Dry and Saline Environments in ARASIA Member States

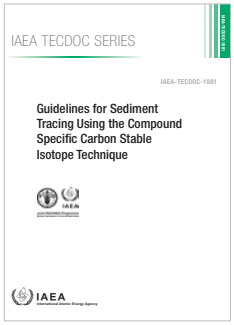
IAEA TECDOC Series No. 1841



This publication serves as a reference guide for Member States and interested specialized readers wishing to work on agriculture in dry and saline environment, in particular those located in the Middle East region. All information and instructions given in this guide are based on successful and sound practices applied in Member States for sustainable cropping of salt affected soils. It will help scientists and farmers to select the management alternatives most efficient for agriculture in saline environments within their own countries. The publication also focuses on the possible use of isotope techniques in dealing with salinity and droughts conditions affecting crop production.

English (123 pp., 15 figs; 2018) | ISBN 978-92-0-101918-9 | IAEA-TECDOC-1841 | €18.00

Guidelines for Sediment Tracing Using the Compound Specific Carbon Stable Isotope Technique



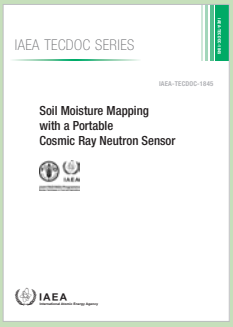
IAEA TECDOC Series No.1881

This publication is intended to support the proper use of the compound specific stable isotope (CSSI) technique for identifying sources of sediment within agroecosystems. Based on the measurement of carbon-13 natural abundance signatures of fatty acids in the soil, this technique allows users to determine and apportion the sources that originate from different land uses. While covering the fundamental concepts of the CSSI technique, this publication is unique in providing step-by-step instructions for scientists, technicians and students on how to effectively use this isotope approach. This comprehensive illustrated guide highlights new opportunities for improving area-wide soil conservation strategies in fragile agricultural landscapes.

English (66 pp., 29 figs; 2019) | ISBN 978-92-0-158519-6 | IAEA-TECDOC-1881 | €18.00

Soil Moisture Mapping with a Portable Cosmic Ray Neutron Sensor

IAEA TECDOC Series No. 1845



This publication was developed as an informational guide for soil moisture mapping at landscape level through a portable 'backpack' cosmic ray neutron sensor. This recently developed device monitors soil water content in a non-invasive way using background neutron counts. It is used to measure water content in the topsoil over wide areas, covering approximately 20 hectares with one single measurement. Through its mobility and its combination of series of measurements this provides the spatial variability of the soil water content for better agricultural water management. The publication provides scientists, technicians and students with the necessary information, guidance and steps to calibrate, validate and deploy this portable cosmic ray neutron sensor.

English (43 pp., 22 figs; 2018) | ISBN 978-92-0-102018-5 | IAEA-TECDOC-1845 | €18.00

Soil Quality and Nutrient Management for Sustainable Food Production in Mulch Based Cropping Systems in Sub-Saharan Africa

Final Report of a Coordinated Research Project

IAEA TECDOC Series No. 1858

This publication summarizes the results from a joint FAO/IAEA coordinated research project (CRP) and provides an integrated and crop-need-based nutrient and water management plan for growing various crops in the moist and dry savannahs of sub-Saharan Africa. The CRP participants investigated the effects of soil management and agronomic practices in mulch-based farming systems. Impacts on soil fertility, ecosystem service efficiency and agricultural productivity were assessed. Climate change and variability in cropping or integrated crop-livestock systems were considered. The publication provides relevant information on how to improve soil fertility and soil health by applying nuclear techniques and the principles of conservation agriculture. By using these improved crop management methods, farmers can enhance soil resilience, optimize crop yields and minimize production costs.

English (92 pp., 7 figs; 2018) | ISBN 978-92-0-109218-2 | IAEA-TECDOC-1858 | €18.00

ANIMAL PRODUCTION

Radiation Protection and Safety in Veterinary Medicine

Safety Reports Series No. 104

This Safety Report provides guidance on the safe use of radiation for imaging and treatment in veterinary medicine with the objective ensuring the safety and radiation protection of workers and members of the public. The publication addresses occupational exposure and public exposure in the use of radiation in veterinary medicine and safety issues that should be considered in order to be compliant with the International Basic Safety Standards (IAEA Safety Standards Series No. GSR Part 3). Consideration is given to the topics of source security and emergency response that might arise with the use of radioactive material in veterinary medicine. Although primarily intended for regulators and workers in veterinary medicine, the publication will also be relevant for professional bodies, ethics committees, and suppliers of equipment and software.

English (Forthcoming) | ISBN 978-92-0-107319-8 | STI/PUB/1894 | €75.00

Physics,
Nuclear Analytical Techniques,
Research Reactors and Particle
Accelerators (Applications)

NUCLEAR MEASUREMENT TECHNIQUES AND INSTRUMENTATION


X-MET8000
Expert
AA-6063

Advances in Neutron Activation Analysis of Large Objects with Emphasis on Archaeological Examples

Results of a Coordinated Research Project

IAEA TECDOC Series No. 1838

This publication is a compilation of the main results and findings of an IAEA coordinated research project (CRP). In particular, it discusses an innovative variation of neutron activation analysis (NAA) known as large sample NAA (LSNAA). There is no other way to measure the bulk mass fractions of the elements present in a large sample (up to kilograms in mass) non-destructively. Examples amenable to LSNAA include irregularly shaped archaeological artefacts, excavated rock samples, large samples of assorted ore, and finished products, such as nuclear reactor components. Advantages of LSNAA applications, limitations and scientific and technological requirements are described in this publication, which serves as a reference of interest not only to NAA experts, research reactor personnel and those considering this technique, but also to various stakeholders and users such as researchers, industrialists, environmental and legal experts, and administrators.

English (72 pp., 11 figs; 2018) | ISBN 978-92-0-100618-9 | IAEA-TECDOC-1838 | €18.00

Determination of Radioactivity in Terrestrial Environmental Samples: From the Basics to Complex Case Studies

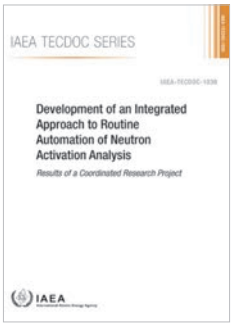
This publication presents a comprehensive overview of the techniques used for the determination of radioactivity in terrestrial environmental samples. It is written for scientists and researchers involved in the determination of environmental radioactivity, and is intended to facilitate the transfer of knowledge about the measurement of radionuclides and applications of nuclear analytical techniques for environmental monitoring. Case studies and examples are presented throughout the publication to illustrate the concepts described.

English (Forthcoming) | ISBN 978-92-0-106719-7 | STI/PUB/1888 | €80.00

Development of an Integrated Approach to Routine Automation of Neutron Activation Analysis

Results of a Coordinated Research Project

IAEA TECDOC Series No. 1839

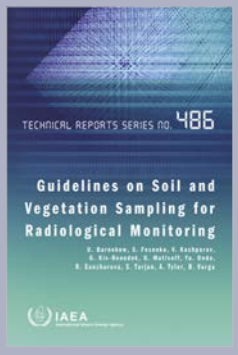


Neutron activation analysis (NAA) is a powerful technique for determining bulk composition of major and trace elements. Automation may contribute significantly to keep NAA competitive for end users. It provides opportunities for a larger analytical capacity and a shorter overall turnaround time if large series of samples have to be analysed. This publication documents and disseminates the expertise generated on automation in NAA during a coordinated research project (CRP). The CRP participants presented different cost-effective designs of sample changers for gamma ray spectrometry as well as irradiation devices, and were able to construct and successfully test these systems. They also implemented, expanded and improved quality control and quality assurance as a cross-cutting topical area of their automated NAA procedures. The publication serves as a reference of interest to NAA practitioners, experts and research reactor personnel, but also to various stakeholders and users interested in basic research and/or services provided by NAA. The individual country reports are available on the CD-ROM attached to this publication.

English (70 pp., 25 figs; 2018) | ISBN 978-92-0-103818-0 | IAEA-TECDOC-1839 | €18.00

Guidelines on Soil and Vegetation Sampling for Radiological Monitoring

Technical Reports Series No. 486

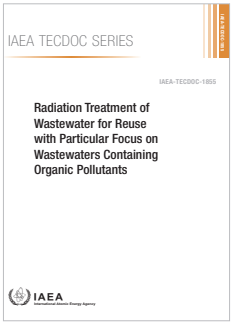


This publication addresses the sampling of soil and vegetation in terrestrial ecosystems, including agricultural, forest and urban environments, contaminated with radionuclides from events such as radiation accidents, radiological incidents and past nuclear activities. It considers sampling strategies and programmes, which are relevant for both emergency and existing exposure situations. Practical information is provided on the design and implementation of sampling programmes for soil and vegetation within the framework of environmental monitoring. Examples of best practice on the formulation of optimized sampling strategies for different exposure situations are given based on the experience and lessons learned from implementation of past and existing programmes.

English (247 pp., 92 figs; 2019) | ISBN 978-92-0-102218-9 | STI/DOC/010/486 | €76.00

Radiation Treatment of Wastewater for Reuse with Particular Focus on Wastewaters Containing Organic Pollutants

IAEA TECDOC Series No. 1855

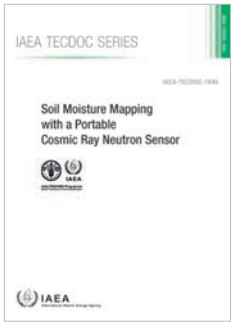


The treatment of wastewater presents the dual challenge of protecting public health and the environment. The presence of increasing amounts of chemical contaminants such as pharmaceuticals, petrochemicals, pesticides and dyes resulting from agricultural, industrial or municipal activities has potential negative impacts on ecosystems. Radiation technologies have been studied for many years and their reliability and effectiveness have been demonstrated. This publication provides new insights into radiation treatment methodologies, particularly the evaluation of toxicity of waste water after radiation treatment, technoeconomic aspects of such treatment and its integration with existing conventional technologies.

English (218 pp., 7 figs; 2018) | ISBN 978-92-0-107818-6 | IAEA-TECDOC-1855 | €18.00

Soil Moisture Mapping with a Portable Cosmic Ray Neutron Sensor

IAEA TECDOC Series No. 1845

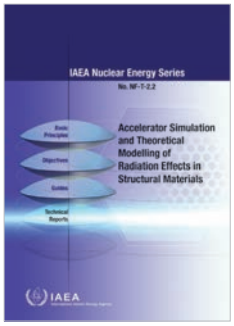


This publication was developed as an informational guide for soil moisture mapping at landscape level through a portable 'backpack' cosmic ray neutron sensor. This recently developed device monitors soil water content in a non-invasive way using background neutron counts. It is used to measure water content in the topsoil over wide areas, covering approximately 20 hectares with one single measurement. Through its mobility and its combination of series of measurements this provides the spatial variability of the soil water content for better agricultural water management. The publication provides scientists, technicians and students with the necessary information, guidance and steps to calibrate, validate and deploy this portable cosmic ray neutron sensor.

English (43 pp., 22 figs; 2018) | ISBN 978-92-0-102018-5 | IAEA-TECDOC-1845 | €18.00

Accelerator Simulation and Theoretical Modelling of Radiation Effects in Structural Materials

IAEA Nuclear Energy Series No. NF-T-2.2



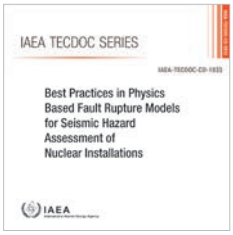
This publication summarizes the findings and conclusions of the IAEA coordinated research project (CRP) on accelerator simulation and theoretical modelling of radiation effects, aimed at supporting Member States in the development of advanced radiation resistant structural materials for implementation in innovative nuclear systems. This aim can be achieved through enhancement of 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 were 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, multiscale modelling tools, and advanced examination techniques.

English (116 pp.; 2018) | ISBN 978-92-0-107415-7 | STI/PUB/1732 | €39.00

Best Practices in Physics Based Fault Rupture Models for Seismic Hazard Assessment of Nuclear Installations

Proceedings of a Workshop Held in Vienna, 18–20 November 2015

IAEA TECDOC Series No. 1833



These proceedings present the outcomes of a workshop convened by the IAEA in 2015. The workshop brought together experts in seismology and earthquake engineering to discuss the applicability of the so-called physics based fault rupture models to generate synthetic earthquake ground motion data for meaningful extrapolation of ground motion prediction in areas where there is a lack of sufficient observations. Fault rupture modelling is recommended for estimating strong motion in cases where nearby faults contribute significantly to the seismic hazard for nuclear installations. The overall aspects and process of the modelling and ground motion simulation are described in IAEA Safety Standards Series No. SSG-9, published in 2010. However, after the massive earthquake in Japan in 2011, there has been further progress in physics based fault rupture modelling. Therefore, the IAEA arranged this workshop and the publication arising from it. The intention is to provide practical, up-to-date information contributing to effective seismic hazard analysis.

English (2018) | ISBN 978-92-0-158917-0 | IAEA-TECDOC-CD-1833 | €18.00

Conceptual Development of Steady State Compact Fusion Neutron Sources

Report of a Coordinated Research Project

IAEA TECDOC Series No. 1875

Fusion neutron sources have many important practical uses, including triggering fission reactions, manufacturing medical isotopes, testing materials and components for use in future fusion power reactors, and facilitating the production of various isotopes like tritium. All these applications can be potentially improved by achieving high energy compact fusion neutron sources (CFNSs). The present publication is a compilation of the main results and findings of an IAEA coordinated research project on the development of concepts and conceptual designs for both low and high power CFNSs. Through the collaboration of experts in the participating Member States, the results achieved under the project laid the foundation for practical applications of intense fusion neutron sources.

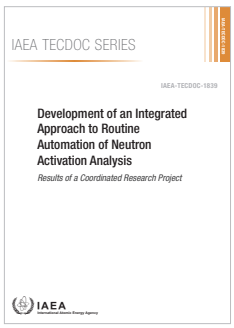
English (32 pp., 6 figs; 2019) | ISBN 978-92-0-103519-6 | IAEA-TECDOC-1875 | €18.00

NUCLEAR ANALYTICAL TECHNIQUES

Development of an Integrated Approach to Routine Automation of Neutron Activation Analysis

Results of a Coordinated Research Project

IAEA TECDOC Series No. 1839

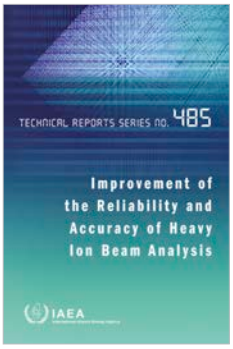


Neutron activation analysis (NAA) is a powerful technique for determining bulk composition of major and trace elements. Automation may contribute significantly to keep NAA competitive for end users. It provides opportunities for a larger analytical capacity and a shorter overall turnaround time if large series of samples have to be analysed. This publication documents and disseminates the expertise generated on automation in NAA during a coordinated research project (CRP). The CRP participants presented different cost-effective designs of sample changers for gamma ray spectrometry as well as irradiation devices, and were able to construct and successfully test these systems. They also implemented, expanded and improved quality control and quality assurance as a cross-cutting topical area of their automated NAA procedures. The publication serves as a reference of interest to NAA practitioners, experts and research reactor personnel, but also to various stakeholders and users interested in basic research and/or services provided by NAA. The individual country reports are available on the CD-ROM attached to this publication.

English (70 pp., 25 figs; 2018) | ISBN 978-92-0-103818-0 | IAEA-TECDOC-1839 | €18.00

Improvement of the Reliability and Accuracy of Heavy Ion Beam Analysis

Technical Reports Series No. 485



This publication highlights the achievements of an IAEA coordinated research project addressing limitations in the utilization of heavy ions, through the delivery of better analytical tools with a higher degree of reliability, accuracy and user confidence, thereby enabling an expansion in the range of problems that can be solved. Relevant to researchers in ion beam laboratories, which utilize heavy ion beams for materials research, this publication will also be of interest to those using light ion beams for other materials science problems, as the underlying knowledge is common to all ion beam types. The database of the new stopping cross-sections included in this publication contains extensive new data not available before.

English (198 pp.; 96 figs; 2019) | ISBN 978-92-0-103517-2 | STI/DOC/010/485 | €45.00

Radiation Safety in Well Logging

Specific Safety Guide

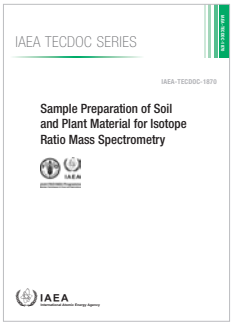
IAEA Safety Standards Series No. SSG-57

This Safety Guide provides recommendations on the use of radioactive sources and radiation generators in well logging, including in the manufacture, calibration and maintenance of well logging tools. It provides recommendations on radiation protection and safety for the storage, use and transport of such radiation sources. The guidance in this publication is aimed primarily at operating organizations that are authorized to undertake well logging with radiation sources, as well as their employees and radiation protection officers. The guidance will also be of interest to regulatory bodies, and to designers, manufacturers, suppliers, and maintenance and servicing organizations of well logging equipment that contains radiation sources.

English (95 pp.; 2020) | ISBN 978-92-0-105819-5 | STI/PUB/1879 | €50.00

Sample Preparation of Soil and Plant Material for Isotope Ratio Mass Spectrometry

IAEA TECDOC Series No. 1870



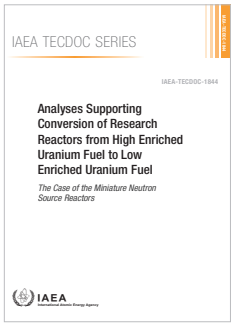
Stable isotope techniques can help improve soil management and crop nutrition. To ensure the quality of stable isotope analysis through isotope ratio mass spectrometry (IRMS), appropriate sample preparation is crucial. This publication presents methods for proper plant and soil sample processing for IRMS analysis. The information on such methods is often described in a summarized and non-comprehensive way without illustration of every step. This publication fills this gap and presents a selection of standard operating procedures and provides highly detailed information on sample preparation that will support practitioners in conducting reliable isotope analysis on plant and soil materials.

English (48 pp.; 2019) | ISBN 978-92-0-102019-2 | IAEA-TECDOC-1870 | €18.00

Analyses Supporting Conversion of Research Reactors from High Enriched Uranium Fuel to Low Enriched Uranium Fuel

The Case of the Miniature Neutron Source Reactors

IAEA TECDOC Series No. 1844

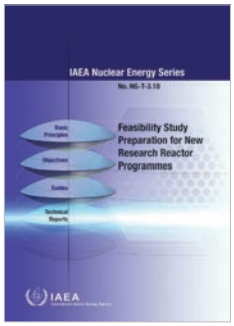


This publication was developed based on the results of an IAEA coordinated research project (CRP) and will serve as a reference to those potentially involved in conversion of research reactors from high enriched uranium (HEU) to low enriched uranium (LEU). The publication contains comprehensive design and safety analyses for the conversion of miniature neutron source reactors (MNSRs) and includes analyses that were performed by MNSR operating organizations participating in the CRP using data specific to their MNSR. The outcome of this CRP can therefore be used to provide best practice guidelines in preparation for conversion of research reactors by individual research reactor operating organizations, and as a procedural and methodological reference for regulatory bodies and other stakeholders involved in the conversion of research reactors.

English (245 pp., 126 figs; 2018) | ISBN 978-92-0-101818-2 | IAEA-TECDOC-1844 | €18.00

Feasibility Study Preparation for New Research Reactor Programmes

IAEA Nuclear Energy Series No. NG-T-3.18



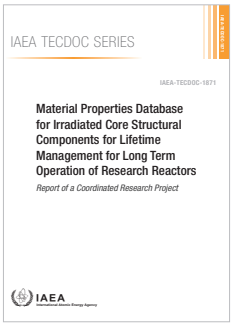
This publication describes the various elements to be included in a comprehensive, robust and logically structured feasibility study report for a new research reactor project. It provides information for the main supporting organization or team of a new research reactor to enable them to undertake an authoritative and comprehensive feasibility study that could be submitted to decision makers for their review in order to support proposals and endorse an action plan for construction of such a facility. It includes considerations of justification for a new research reactor, associated key nuclear infrastructure issues, cost–benefit analysis and risk management that would have to be addressed prior to authorizations for the establishment of a new research reactor. Addressing these issues will help Member States to develop a comprehensive understanding of all the roles, obligations and commitments involved in establishing and operating a research reactor and ensure that these are met during all phases of the project life cycle. The publication also includes a generic template for preparing a feasibility study report and provides some examples and lessons learned from individual Member States in preparing such studies.

English (33 pp.; 5 figs; 2018) | ISBN 978-92-0-104518-8 | STI/PUB/1816 | €30.00

Material Properties Database for Irradiated Core Structural Components for Lifetime Management for Long Term Operation of Research Reactors

Report of a Coordinated Research Project

IAEA TECDOC Series No. 1871



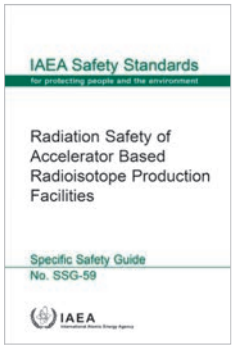
This publication presents the results of an IAEA coordinated research project which served as a forum for the establishment of a research reactor material properties database for irradiated core structural components that are important to safety. The database is a compilation of data from comprehensive literature reviews, coordinated research projects and experimental data from research reactors on changes in research reactor core structural material properties owing to irradiation. Such a structured database is a resource for those involved in the aging assessment of core materials used in research reactors to ensure the reactor's continued safe operation and possible life extension. The publication describes the coordinated effort to provide a comprehensive background and relevant information on the properties of irradiated core structural materials for research reactors and to make these data available to the research reactor community. Use of the information provided will contribute to the safe and reliable long-term operation and lifetime extension of operating research reactors, as well as to the design of new ones.

English (64 pp., 1 fig.; 2019) | ISBN 978-92-0-102519-7 | IAEA-TECDOC-1871 | €18.00

Radiation Safety of Accelerator Based Radioisotope Production Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-59



Radioisotopes are used worldwide in a range of medical, industrial, research and academic applications. A large proportion of these radioisotopes are produced in particle accelerators, and the number of institutions that operate linear accelerators or cyclotrons and manufacture and distribute radiopharmaceuticals, for example, is significant and increasing. The production of radioisotopes using particle accelerators poses significant radiation hazards to workers, members of the public, and the environment when accelerators are operated without adequate radiation safety measures. This Safety Guide provides practical guidance for implementing radiation protection and safety measures in such facilities involved in the production and use of radioisotopes.

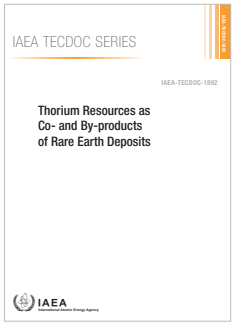
English (85 pp., 4 figs; 2020) | ISBN 978-92-0-105919-2 | STI/PUB/1880 | €42.00

Uranium Geology,
Exploration and Mining,
Hydrology

EARTH SCIENCES

Thorium Resources as Co- and By-products of Rare Earth Deposits

IAEA TECDOC Series No. 1892

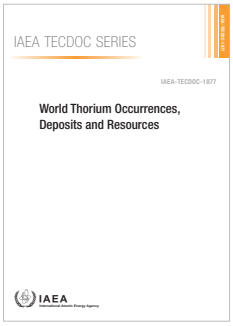


Research has been published over the past few decades on the possible use of thorium in various nuclear power reactor types. Therefore, it is worthwhile to analyse the supply situation for additional thorium generated as a by-product of commodities produced for non-nuclear purposes. This publication provides information on the natural occurrence of thorium, the geology of thorium and potential thorium resources. It presents an overview of exploration and evaluation of projects, including studies for project feasibility, principles of ore processing, as well as market and production scenarios. Selected examples of deposits containing thorium as a potential co-product or by-product are presented as case studies.

English (80 pp., 18 figs; 2019) | ISBN 978-92-0-163319-4 | IAEA-TECDOC-1892 | €18.00

World Thorium Occurrences, Deposits and Resources

IAEA TECDOC Series No. 1877

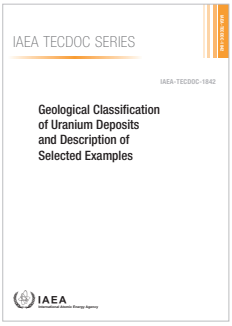


Mindful of possible future limitations on the availability of uranium, the introduction of the thorium fuel cycle is potentially a complementary source of nuclear energy. This publication assimilates current knowledge of thorium geology and mineralization into a brief account of the worldwide occurrence of thorium resources. Although thorium is currently not commercially viable as a fuel, it is important to pre-emptively assess thorium related information should that situation change. Thus, the publication provides an overview of the variety of natural thorium deposit types with associated thorium geology and thorium resources. It reviews available data on thorium occurrences/deposits and thorium resources and presents a classification of deposits according to geological and economic criteria.

English (152 pp., 63 figs; 2019) | ISBN 978-92-0-103719-0 | IAEA-TECDOC-1877 | €18.00

Geological Classification of Uranium Deposits and Description of Selected Examples

IAEA TECDOC Series No. 1842

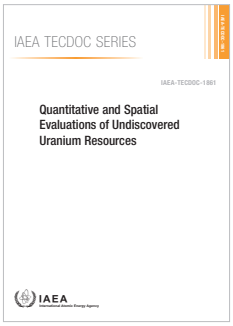


With the increased level of investigation into uranium deposits in recent years, a wealth of new information has become available, which has made it possible to investigate some of the least understood aspects of uranium metallogeny. This publication defines a new classification scheme, which is simple and descriptive, but flexible enough to encompass the recent advances in our understanding of uranium geology and deposit genesis. It contains improved definition of the deposit types, supported by type examples of those deposits for which good data are available, but not well described in previous literature. Along with the descriptive information, new data on uranium resources available for each deposit type are also provided.

English (428 pp., 209 figs; 2018) | ISBN 978-92-0-101618-8 | IAEA-TECDOC-1842 | €18.00

Quantitative and Spatial Evaluations of Undiscovered Uranium Resources

IAEA TECDOC Series No. 1861

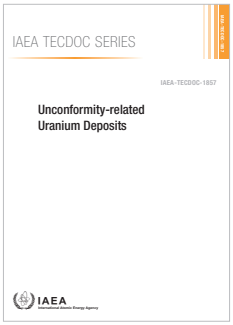


This publication provides an overview of aspects of the uranium production cycle including evaluating the global uranium supply/demand situation. It presents insights on techniques for analysis of undiscovered resources for mineral commodities, which has formed part of a robust statistical procedure in the last 20 years, but has never been systematically applied to uranium. For this publication, experts have carried out case studies on speculative or undiscovered uranium resource potential, systematically applying spatial assessment techniques often with non-spatial quantitative techniques. This publication is the result of the work contributed by those experts over the period 2014–2016 and provides the tools for Member States to investigate and evaluate undiscovered uranium resources and deposits.

English (638 pp., 54 figs; 2018) |
ISBN 978-92-0-109518-3 |
IAEA-TECDOC-1861 | €18.00

Unconformity-related Uranium Deposits

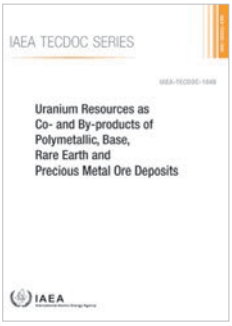
IAEA TECDOC Series No. 1857



This publication provides a description of existing and emerging technologies to effectively integrate geological, geophysical and geochemical data to recognize the footprint (i.e. the total extent that the mineralizing system has affected its environment) of the deposit and the key vectors to the uranium mineralization. In addition, insights into exploration strategies and risks associated with country and basin selection are discussed, including the role of the IAEA and academia in supporting the exploration process. Representing an unprecedented, comprehensive reference document on unconformity-related uranium deposits with over 350 citations, this publication will be useful for decision makers at all levels, including governmental officers in energy and mineral resources, exploration companies, geologists, geological surveys, energy companies, universities and research institutions, and natural resource authorities.

English (308 pp., 127 figs; 2018) | ISBN 978-92-0-108518-4 | IAEA-TECDOC-1857 | €18.00

Uranium Resources as Co- and By-products of Polymetallic, Base, Rare Earth and Precious Metal Ore Deposits



IAEA TECDOC Series No. 1849

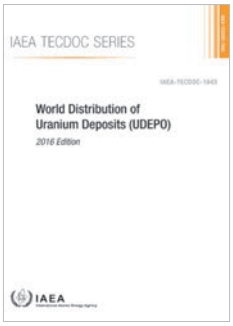
This publication highlights the potential presence of uranium in ore deposits that are not commonly thought of as uraniferous and therefore highlights potential additional sources of uranium supply. It also provides insights into potential legacy mine waste issues for such deposits if the uranium is not extracted. The publication also outlines various historical mining and processing approaches, supported by case studies of each deposit type. The appendix to this publication includes a detailed IAEA deposit classification of uranium deposits and their global distribution, and shows for comparison purposes the equivalent distribution of other deposit types not traditionally considered as uranium deposits (but nevertheless with uranium extraction potential).

English (168 pp., 69 figs; 2018) |
ISBN 978-92-0-103618-6 |
IAEA-TECDOC-1849 | €18.00

World Distribution of Uranium Deposits (UDEPO)

2016 Edition

IAEA TECDOC Series No. 1843



The World Distribution of Uranium Deposits (UDEPO) is a database of technical, geographical and geological characteristics of worldwide uranium deposits. This publication presents and describes modifications made since 2009. It presents a preliminary statistical and tabular analysis of the data for the first time, with a view to ensuring that the data are robust enough to serve as a basis for more sophisticated analysis in the future. This is supported by a detailed explanation of the structure of the database to better understand the nature of the data as a form of metadata. Furthermore, some basic graphical representations of the statistical and spatial distribution of the database are presented for the first time.

English (260 pp., 32 figs; 2018) | ISBN 978-92-0-101518-1 | IAEA-TECDOC-1843 | €18.00

World Distribution of Uranium Deposits

Second Edition

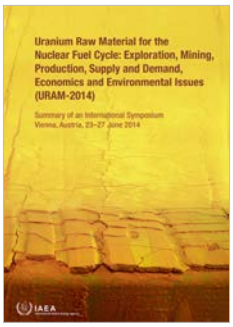
In 1995 the International Atomic Energy Agency published a hard copy map of World Distribution of Uranium Deposits, in collaboration with the Geological Survey of Canada. This second edition of the World Distribution of Uranium Deposits presents new information, such as additional deposits, a broader range of deposit sizes, a revised deposit classification system and improved geological visualization information. The online PDF version also includes enhanced functionality with layers and query capability.

English (2018) | ISBN 978-92-0-100118-4 | STI/PUB/1800 | €20.00

Uranium Raw Material for the Nuclear Fuel Cycle: Exploration, Mining, Production, Supply and Demand, Economics and Environmental Issues (URAM-2014)

Summary of an International Symposium Held in Vienna, Austria, 23–27 June 2014

Proceedings Series

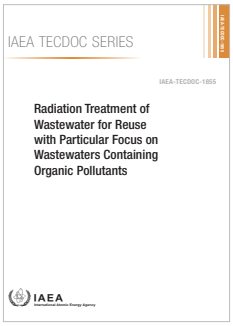


These proceedings present the outcome of an IAEA symposium covering all areas of the uranium production cycle — including uranium geology, exploration, mining; milling and refining of uranium concentrates; and safety, environmental, social, training and regulatory issues — and report on uranium supply and demand, and market scenarios. The meeting demonstrated that the uranium industry and practitioners were taking a lead in developing innovative solutions in exploration and production which are expected to keep the costs low, while achieving high performance in health, safety and environmental performance. New initiatives like innovative financing, 'smart mines', integrated exploration, and 'wealth from wastes' were extensively discussed in the symposium. The publication includes the summaries of the individual sessions, the opening address, a summary of the panel discussion, the closing keynote addresses and the conference president's concluding remarks. The technical papers based on the majority of the oral and poster papers are available on the CD-ROM attached to this publication.

English (88 pp., 2 figs; 2019) | ISBN 978-92-0-109219-9 | STI/PUB/1903 | €39.00

Radiation Treatment of Wastewater for Reuse with Particular Focus on Wastewaters Containing Organic Pollutants

IAEA TECDOC Series No. 1855

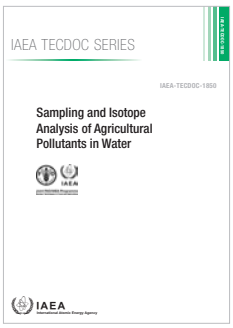


The treatment of wastewater presents the dual challenge of protecting public health and the environment. The presence of increasing amounts of chemical contaminants such as pharmaceuticals, petrochemicals, pesticides and dyes resulting from agricultural, industrial or municipal activities has potential negative impacts on ecosystems. Radiation technologies have been studied for many years for treating different organic pollutants, and their reliability and effectiveness have been demonstrated. This publication provides new insights into radiation treatment methodologies, particularly the evaluation of toxicity of wastewater after radiation treatment, technoeconomic aspects of such treatment and its integration with existing conventional technologies.

English (218 pp., 7 figs; 2018) | ISBN 978-92-0-107818-6 | IAEA-TECDOC-1855 | €18.00

Sampling and Isotope Analysis of Agricultural Pollutants in Water

IAEA TECDOC Series No. 1850



Stable isotope techniques can help identify the sources of water pollution associated with agricultural activities. Knowing the origin of nutrients or contaminants is essential to improve agricultural practices. To ensure the quality of stable isotope analysis, appropriate sampling and sample preparation are crucial. This publication presents methods for surface water sampling and sample processing through micro-diffusion and bacterial denitrification combined with laser spectroscopy. Information on such methods is often described in a summarized and non-comprehensive way, without proper illustration of every step. This publication aims to bridge this gap for scientists, technicians and students. It presents a selection of standard operating procedures providing guidance in water sampling and sample preparation that are mandatory when conducting reliable isotope analysis on water.

English (59 pp., 13 figs; 2018) | ISBN 978-92-0-105018-2 | IAEA-TECDOC-1850 | €18.00

INDUSTRIAL APPLICATIONS


COMECER
TOUCH

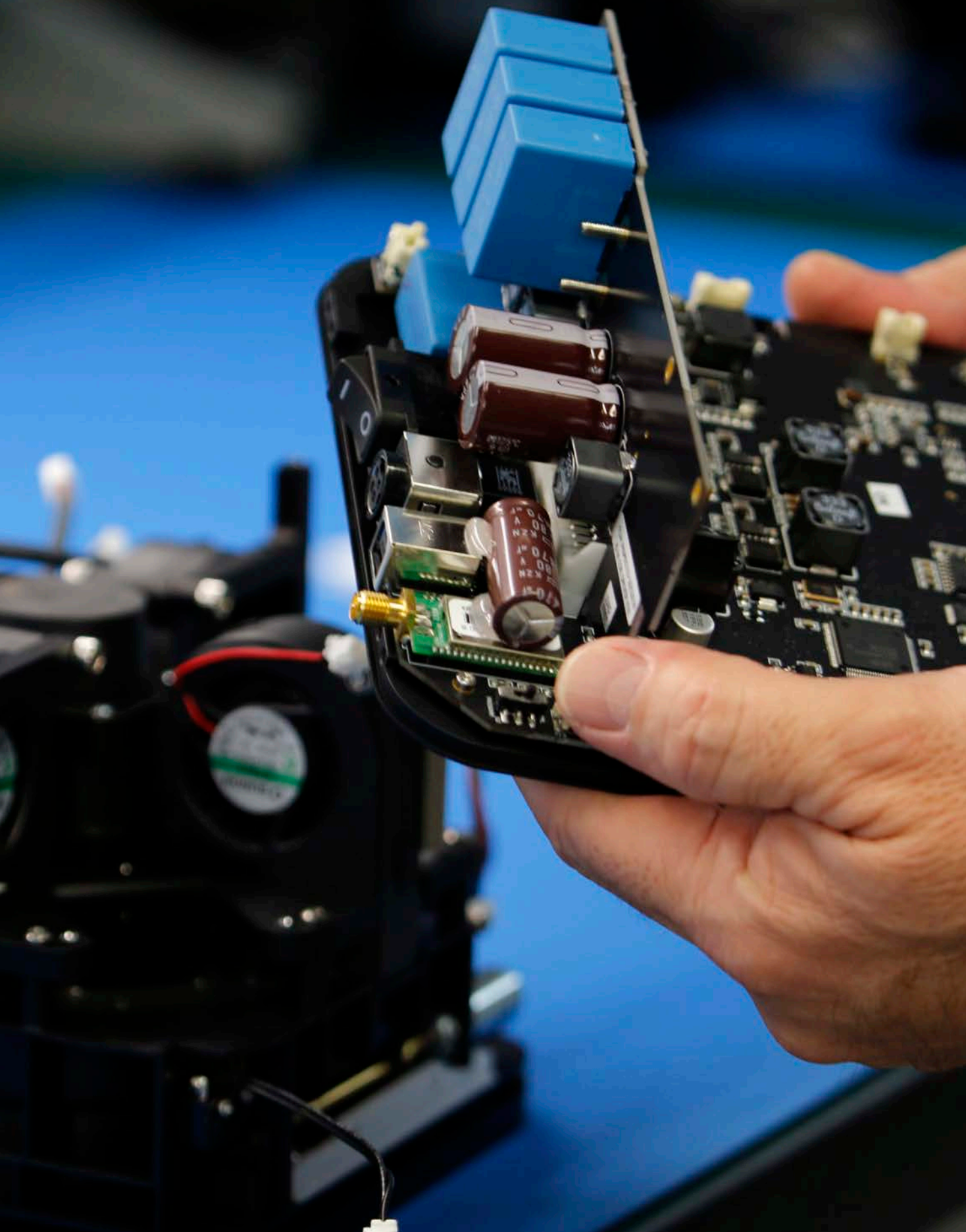
Radiation Safety in the Use of Nuclear Gauges

Specific Safety Guide

IAEA Safety Standards Series No. SSG-58

There are several hundred thousand nuclear gauges incorporating a radioactive source or a radiation generator in use all over the world. They have been used in a wide range of industries to improve the quality of products, optimize processes, and save energy and materials. The economic benefits have been amply demonstrated, and there is clear evidence that nuclear gauge technology can be used safely and will continue to play an important role. Although generic guidance for source handling is available, there have been no targeted recommendations for radiation safety in the use of nuclear gauges. To fill this gap the current publication provides practical guidance for implementing the safety requirements specified in IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, related to the use of nuclear gauges.

English (Forthcoming) | ISBN 978-92-0-106019-8 | STI/PUB/1881 | €51.00



Uranium Mining and Milling,
Fuel Fabrication and Storage,
Nuclear Power Plants,
Research Reactors,
Radiation Sources and Accelerators,
Transport of Radioactive Material,
Fusion Reactors,
Waste Repositories,
Radiation Protection,
Accident Response,
Radioactive Waste Management,
Safety Assessment,
Legal and Governmental
Aspects

NUCLEAR AND RADIATION SAFETY


AV
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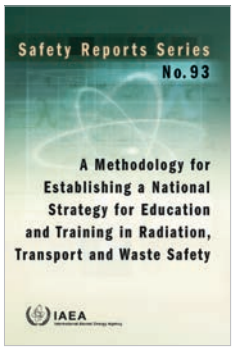
A Methodology for Establishing a National Strategy for Education and Training in Radiation, Transport and Waste Safety

Safety Reports Series No. 93



This publication provides Member States with a detailed methodology to establish a national strategy for education and training in radiation, transport and waste safety, in order to build competence in a sustainable and timely manner. Guidance is provided on assessing education and training needs, giving consideration to the national legal and regulatory framework for education and training, and the current and future facilities and activities; designing the national education and training programme based on the needs; and optimizing national resources to complement external assistance. A practical example of the application of the methodology is generated for a hypothetical country, outlining the chronological sequence of the actions to be taken, their timeframe, and the role and contribution of the different national stakeholders. This methodology has been tested in the field during 20 regional workshops attended by about 300 participants from more than 80 Member States.

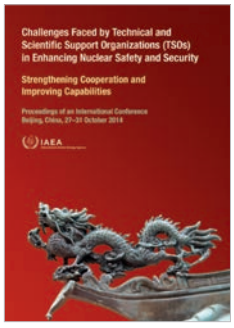
English (66 pp., 2 figs; 2018) | ISBN 978-92-0-102217-2 | STI/PUB/1778 | €41.00

Challenges Faced by Technical and Scientific Support Organizations (TSOs) in Enhancing Nuclear Safety and Security

Strengthening Cooperation and Improving Capabilities

Proceedings of an International Conference Held in Beijing, China, 27–31 October 2014

Proceedings Series



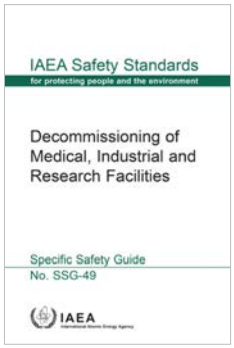
This publication is the proceedings of an international conference with the primary objective of examining technical and scientific support organizations (TSOs) and their role in the light of the Fukushima Daiichi accident. Through the presentations and discussions, the conference participants assessed the effectiveness of TSOs and explored ways to improve capabilities and strengthen cooperation among TSOs. Other topics addressed included the challenges faced by TSOs when interacting with regulatory bodies, the industry and the public; and the role of TSOs in terms of emergency preparedness and response. The outcome of the conference is summarized in nine recommendations, which include the crucial role of international cooperation and networking among TSOs, as it contributes to increasing experience feedback and provides the information base needed to tackle new cases.

English (92 pp.; 2018) | ISBN 978-92-0-108118-6 | STI/PUB/1833 | €48.00

Decommissioning of Medical, Industrial and Research Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-49



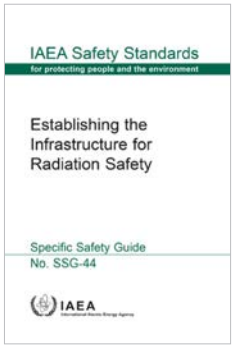
Decommissioning is the last step in the lifetime management of an authorized facility and must be considered during the design, construction, commissioning and operation of such facilities. This Safety Guide provides guidance on how to comply with requirements for the safe decommissioning of medical, industrial and research facilities. It addresses all aspects of decommissioning that are required to ensure safety, such as roles and responsibilities, strategy and planning for decommissioning, conduct of decommissioning actions and termination of the authorization for decommissioning. The intended audience are those individuals involved in policy and strategy development, regulatory control, and planning and implementation of decommissioning.

English (106 pp., 3 figs; 2019) | ISBN 978-92-0-110118-1 | STI/PUB/1841 | €42.00

Establishing the Infrastructure for Radiation Safety

Specific Safety Guide

IAEA Safety Standards Series No. SSG-44

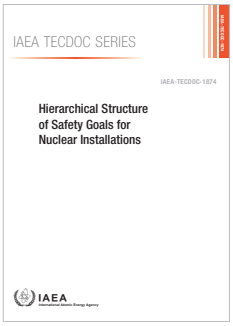


The objective of this Safety Guide is to provide guidance on the establishment of a national radiation safety infrastructure in compliance with the IAEA safety standards. It provides recommendations, in the form of actions, on meeting the relevant safety requirements in an effective and integrated manner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

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

Hierarchical Structure of Safety Goals for Nuclear Installations

IAEA TECDOC Series No. 1874



This publication discusses the development and application of a hierarchical structure of safety goals encompassing high level goals and detailed technical requirements that may assist in forming a coherent and consistent approach to nuclear safety. The suggested hierarchy of safety goals provides a practical approach to consistently embracing the set of safety related requirements, both qualitative and quantitative, and developing the interconnections between them. Specifically, the structure supports adding country specific safety goals (e.g. risk metrics) to the overall safety considerations in a consistent manner. This process can be aided by reference to the IAEA safety standards.

English (122 pp., 8 figs; 2019) | ISBN 978-92-0-103119-8 | IAEA-TECDOC-1874 | €18.00

Human and Organizational Aspects of Assuring Nuclear Safety — Exploring 30 Years of Safety Culture

Proceedings of an International Confernence Held in Vienna, Austria, 22–26 February 2016

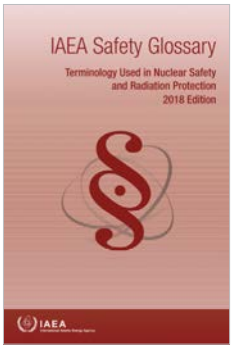
Proceedings Series

These proceedings present the outcome of an international conference, at which the nuclear community had the opportunity to reflect on the pivotal role that human and organizational aspects play in assuring nuclear safety. Held 30 years after the Chernobyl accident which led to the international adoption of the concept of safety culture, the conference provided distinguished experts and practitioners with a unique opportunity to share insights from the past and visions for a safer future. The publication contains the conference opening and closing addresses, summaries of all conference sessions as well as the fully edited papers produced for the conference plenary sessions. The papers presented at the parallel sessions and dialogue sessions of the conference are included in their original form in the CD-ROM accompanying the publication.

English (370 pp., 21 figs; 2019) | ISBN 978-92-0-103918-7 | STI/PUB/1810 | €55.00

IAEA Safety Glossary

2018 Edition



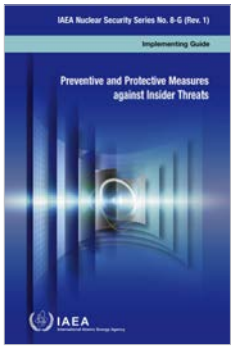
The IAEA Safety Glossary defines and explains technical terms used in the IAEA Safety Standards and other safety related IAEA publications, and provides information on their usage. The 2018 Edition of the IAEA Safety Glossary is a new edition of the IAEA Safety Glossary, originally issued in 2007. It has been revised and updated to take into account new terminology and usage in safety standards issued between 2007 and 2018. The revisions and updates reflect developments in the technical areas of application of the safety standards and changes in regulatory approaches in Member States.

English (261 pp., 6 figs; 2019) | ISBN 978-92-0-104718-2 | STI/PUB/1830 | €40.00

Preventive and Protective Measures against Insider Threats

Implementing Guide

IAEA Nuclear Security Series No. 8-G (Rev. 1)



This publication is a revision of IAEA Nuclear Security Series No. 8, Preventive and Protective Measures against Insider Threats, published in 2008. The new publication provides updated guidance to States, their competent authorities and operators, shippers and carriers on selecting, implementing and evaluating measures for addressing insider threats. It applies to any type of nuclear facility, notably nuclear power plants, research reactors and other nuclear fuel cycle facilities (e.g. enrichment plants, reprocessing plants, fuel fabrication plants and storage facilities), whether in design, redesign, construction, commissioning, operation, shutdown or decommissioning.

English (37 pp., 1 fig.; 2020) | ISBN 978-92-0-103419-9 | STI/PUB/1858 | €24.00

Radiation Safety in the Use of Nuclear Gauges

Specific Safety Guide

IAEA Safety Standards Series No. SSG-58

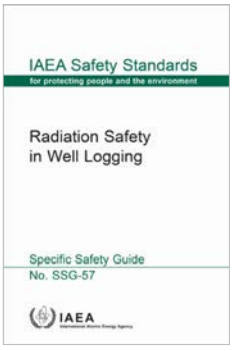
There are several hundred thousand nuclear gauges incorporating a radioactive source or a radiation generator in use all over the world. They have been used in a wide range of industries to improve the quality of products, optimize processes, and save energy and materials. The economic benefits have been amply demonstrated, and there is clear evidence that nuclear gauge technology can be used safely and will continue to play an important role. Although, generic guidance for source handling is available, there have been no targeted recommendations for radiation safety in the use of nuclear gauges. To fill this gap the current publication provides practical guidance for implementing the safety requirements specified in IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, related to the use of nuclear gauges.

English (Forthcoming) | ISBN 978-92-0-106019-8 | STI/PUB/1881 | €51.00

Radiation Safety in Well Logging

Specific Safety Guide

IAEA Safety Standards Series No. SSG-57



This Safety Guide provides recommendations on the use of radioactive sources and radiation generators in well logging, including in the manufacture, calibration and maintenance of well logging tools. It provides recommendations on radiation protection and safety for the storage, use and transport of such radiation sources. The guidance in this publication is aimed primarily at operating organizations that are authorized to undertake well logging with radiation sources, as well as their employees and radiation protection officers. The guidance will also be of interest to regulatory bodies, and to designers, manufacturers, suppliers, and maintenance and servicing organizations of well logging equipment that contains radiation sources.

English (95 pp.; 2020) | ISBN 978-92-0-105819-5 | STI/PUB/1879 | €50.00

Safety Culture Practices for the Regulatory Body

IAEA TECDOC Series No. 1895

This publication is the outcome of an IAEA meeting that provided a forum for senior regulators to share their experience and disseminate knowledge on how safety performance can be improved through effective leadership and management for safety and safety culture. The publication provides practical information for regulatory bodies on promoting and assessing safety culture within their own organizations and providing regulatory oversight of licensees' safety culture activities. Practices from Member States are summarized and common challenges faced by regulatory bodies in implementing these practices are described.

English (86 pp., 7 figs; 2020) | ISBN 978-92-0-100520-5 | IAEA-TECDOC-1895 | €18.00

Management of Residues Containing Naturally Occurring Radioactive Material from Uranium Production and Other Activities

Specific Safety Guide

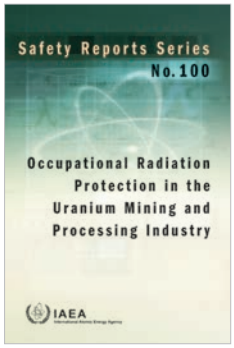
IAEA Safety Standards Series No. SSG-60

This Safety Guide provides recommendations on the establishment of an appropriate regulatory framework for the management of naturally occurring radioactive material (NORM) residues in an integrated manner and using a graded approach. It also elaborates on roles and responsibilities, options for management of NORM residues, long term safety of NORM residues, and exemption and clearance. The publication is targeted at regulatory bodies, operating organizations, technical support organizations and other parties who are interested and involved in management of NORM residues.

English (Forthcoming) | ISBN 978-92-0-106219-2 | STI/PUB/1883 | €42.00

Occupational Radiation Protection in the Uranium Mining and Processing Industry

Safety Reports Series No. 100



This Safety Report has been developed as part of the IAEA programme on occupational radiation protection to provide for the application of its safety standards in implementing a graded approach to the protection of workers against exposures associated with uranium mining and processing. The publication describes the methods of production associated with the uranium industry and provides practical information on the radiological risks to workers in the exploration, mining and processing of uranium. It is a compilation of detailed information on uranium mining and processing stages and techniques, general radiation protection considerations in the relevant industry, general methodologies applicable for control, monitoring and dose assessment, exposure pathways, and radiation protection programmes for a range of commonly used mining and processing techniques.

English (217 pp., 31 figs.; 2020) | ISBN 978-92-0-106919-1 | STI/PUB/1890 | €65.00

Design of Fuel Handling and Storage Systems for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-63

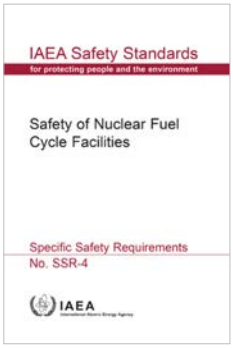
This Safety Guide provides recommendations on how to meet the requirements of IAEA Safety Standards Series No. SSR-2/1 (Rev. 1), Safety of Nuclear Power Plants: Design, in relation to fuel handling and storage systems. The publication addresses the design aspects of handling and storage systems for fuel that remain part of the operational activities of a nuclear reactor. It covers the following stages of fuel handling and storage in a nuclear power plant: receipt, storage and inspection of fresh fuel before use and transfer of fresh fuel into the reactor; removal of irradiated fuel from the reactor and transfer of the irradiated fuel to the spent fuel pool; and reinsertion of irradiated fuel from the spent fuel pool into the reactor. Recommendations are also provided on the storage, inspection and repair of irradiated or spent fuel in the spent fuel pool, and the preparation for the removal of this fuel from the spent fuel pool and on the handling of fuel casks in the spent fuel pool and on their transfer.

English (Forthcoming) | ISBN 978-92-0-108519-1 | STI/PUB/1897 | €32.00

Safety of Nuclear Fuel Cycle Facilities

Specific Safety Requirements

IAEA Safety Standards Series No. SSR-4



This Safety Requirements publication establishes a basis for safety and for safety assessment at all stages in the lifetime of nuclear fuel cycle facilities. A broad scope of requirements is established for site evaluation, design, construction, commissioning, operation and preparation for decommissioning that must be satisfied to ensure safety. These requirements apply to facilities for conversion, enrichment, nuclear fuel production, storage of fresh and spent fuels, reprocessing, preparation for disposal, and associated research and development facilities.

Arabic (135 pp., 1 fig.; 2018) | ISBN 978-92-0-605218-1 | STI/PUB/1791 | €48.00
Chinese (113 pp., 1 fig.; 2018) | ISBN 978-92-0-504818-5 | STI/PUB/1791 | €48.00
English (135 pp., 1 fig.; 2017) | ISBN 978-92-0-103917-0 | STI/PUB/1791 | €48.00
French (147 pp., 1 fig.; 2018) | ISBN 978-92-0-205318-2 | STI/PUB/1791 | €48.00
Russian (171 pp., 1 fig.; 2018) | ISBN 978-92-0-405118-6 | STI/PUB/1791 | €48.00
Spanish (147 pp., 1 fig.; 2019) | ISBN 978-92-0-305418-8 | STI/PUB/1791 | €48.00

Storage of Spent Nuclear Fuel

Specific Safety Guide

IAEA Safety Standards Series No. SSG-15 (Rev. 1)

This publication is a revision by amendment of IAEA Safety Standards Series No. SSG-15 and provides recommendations and guidance on the storage of spent nuclear fuel. It covers all types of storage facility and all types of spent fuel from nuclear power plants and research reactors. It takes into consideration the longer storage periods beyond the original design lifetime of the storage facility that have become necessary owing to delays in the development of disposal facilities and the reduction in reprocessing activities. It also considers developments associated with nuclear fuel, such as higher enrichment, mixed oxide fuels and higher burnup. Guidance is provided on all stages in the lifetime of a spent fuel storage facility, from planning through siting and design to operation and decommissioning. The revision was undertaken by amending, adding and/or deleting specific paragraphs addressing recommendations and findings from studying the accident at the Fukushima Daiichi nuclear power plant in Japan.

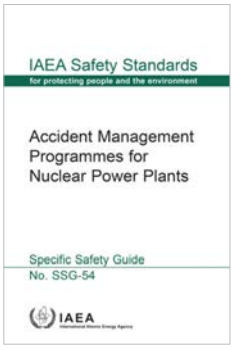
English (Forthcoming) | ISBN 978-92-0-106119-5 | STI/PUB/1882 | €42.00

NUCLEAR POWER PLANTS

Accident Management Programmes for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-54



Accident management is an essential component of nuclear power plant safety, and this Safety Guide provides recommendations on how to establish and maintain an effective accident management programme. Included in the publication are sections covering topics such as the identification of plant vulnerabilities and capabilities, development strategies, verification and validation, training, and interfaces with emergency preparedness and response. Compared with the 2009 version, this publication enhances recommendations related to the instrumentation that would be used during accident management and includes a new chapter on the execution of the accident management programme.

English (81 pp., 3 figs; 2019) | ISBN 978-92-0-108318-0 | STI/PUB/1834 | €43.00

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

Specific Safety Guide

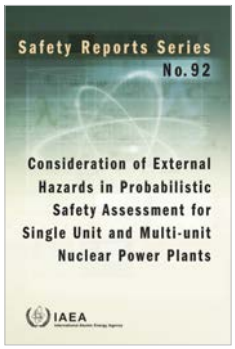
IAEA Safety Standards Series No. SSG-48

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

English (65 pp., 8 figs; 2018) | ISBN 978-92-0-104318-4 | STI/PUB/1814 | €43.00

Consideration of External Hazards in Probabilistic Safety Assessment for Single Unit and Multi-unit Nuclear Power Plants

Safety Reports Series No. 92



This publication outlines the generic methodology for probabilistic safety assessment of nuclear power plants against external hazards. It integrates design, procedural, operational and human factors, and both protection and mitigation aspects that are essential for modelling a nuclear power plant response to an external hazard and to assess the associated risk. It specifically addresses the identification and screening of external hazards considering the impact on multi-unit plants.

English (56 pp.; 2018) | ISBN 978-92-0-101917-2 | STI/PUB/1777 | €40.00

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

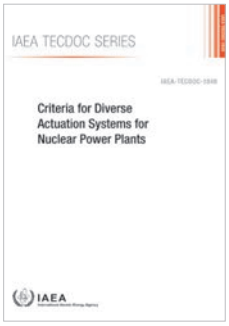
Safety Reports Series No. 82 (Rev. 1)

This Safety Report provides detailed information on ageing management programmes and time limited ageing analyses to manage existing and potential ageing effects and degradation mechanisms of structures, systems and components (SSCs) that are important to the safety of nuclear power plants. It has been written to assist operating organizations and regulatory bodies by specifying a technical basis and providing practical guidance on managing ageing of mechanical and electrical instrumentation and control components, and civil structures. It also provides a common, internationally recognized basis of what constitutes an effective ageing management programme, a knowledge base on ageing management for design of new plants and design reviews, and a roadmap to available information on ageing management.

English (Forthcoming) | ISBN 978-92-0-107419-5 | STI/PUB/1895 | €40.00

Criteria for Diverse Actuation Systems for Nuclear Power Plants

IAEA TECDOC Series No. 1848

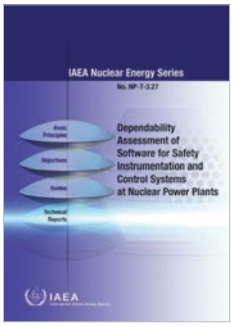


This publication addresses a safety concern within the protection system for nuclear power plants that might result in unacceptable consequences for certain combinations of common cause failures and postulated initiating events, especially in the case of programmable digital protection systems. When this situation is encountered, a diverse actuation system is often provided to back up the reactor protection system. The publication identifies and discusses common criteria for the design of diverse actuation systems at nuclear power plants (NPPs) with the aim of developing a consensus on the adequate level of diversity in the reactor protection systems. It relates to IAEA Safety Standards Series No. SSG-39, Design of Instrumentation and Control Systems for Nuclear Power Plants, and provides specific details for utility engineers, operators, researchers, managers, and personnel responsible for all aspects of design and implementation of instrumentation and control systems of diverse actuation systems for NPPs. It will also aid Member States in supporting assessment of diversity in I&C architecture as a defence against common cause failures.

English (85 pp., 17 figs; 2018) | ISBN 978-92-0-103518-9 | IAEA-TECDOC-1848 | €18.00

Dependability Assessment of Software for Safety Instrumentation and Control Systems at Nuclear Power Plants

IAEA Nuclear Energy Series No. NP-T-3.27



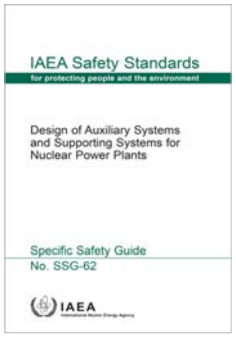
This publication defines a framework that represents the state of the art in assessment methodologies for safety and instrumentation and control software used at nuclear power plants. It describes an approach for developing and communicating assessments based on claims, arguments and evidence. The assessment of software dependability, which encompasses properties such as safety, reliability, availability, maintainability and security, is an essential and challenging aspect of the safety justification. Guiding principles for a dependability assessment are established to provide the basis for defining an assessment strategy and implementing the assessment process. Sources of evidence for the assessment are provided and lessons learned from past digital instrumentation and control system implementation in areas such as software development, operational usage, regulatory review and platform certification are also described.

English (80 pp., 10 figs; 2018) | ISBN 978-92-0-101218-0 | STI/PUB/1808 | €38.00

Design of Auxiliary Systems and Supporting Systems for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-62



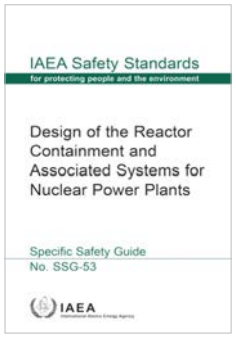
There is a general agreement that auxiliary and supporting systems play an important role in the safe operation of a nuclear power plant. There is, however, no clear definition of such systems. The purpose of this publication is to propose a stepwise definition of auxiliary systems and supporting systems for nuclear power plants with water cooled reactors, to describe the general design concepts and design recommendations that are common to these systems, and to provide recommendations on specific design considerations for a selection of auxiliary and supporting systems.

English (Forthcoming) | ISBN 978-92-0-106419-6 | STI/PUB/1885 | €43.00

Design of the Reactor Containment and Associated Systems for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-53



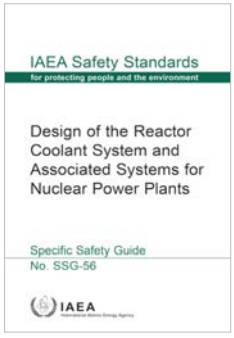
This Safety Guide provides recommendations on meeting the requirements of IAEA Safety Standards Series No. SSR-2/1 (Rev. 1) relevant to reactor containment and associated systems. The publication addresses the containment structure and the systems with the functions of isolation, control and management of mass and energy releases, control and limitation of radioactive releases, and control and management of combustible gases. The Safety Guide is intended for use primarily for land based, stationary nuclear power plants with water cooled reactors designed for electricity generation or for other heat generating applications, such as for district heating or desalination.

English (89 pp., 2 figs; 2019) | ISBN 978-92-0-102819-8 | STI/PUB/1856 | €41.00

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

Specific Safety Guide

IAEA Safety Standards Series No. SSG-56



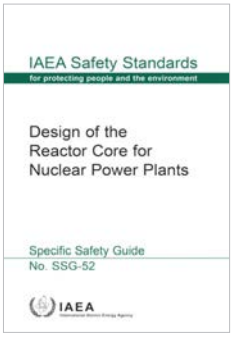
This Safety Guide provides recommendations on how to meet the requirements established in IAEA Safety Standards Series No. SSR-2/1 (Rev. 1) in relation to the reactor coolant system and associated systems for nuclear power plants. It is a revision of IAEA Safety Standards Series No. NS-G-1.9, which it supersedes. The publication takes into account developments, experience and practices in the design of nuclear power plants throughout their lifetime. It references and considers other IAEA safety standards that are relevant and related to the design of the reactor coolant system and associated systems for nuclear power plants. Recommendations to achieve the required reliability of the capabilities designed to transfer residual heat to the ultimate heat sink in the different plant states are also included. As those systems are dependent on specific reactor technologies, more appropriate recommendations have been developed respectively for pressurized light water reactors, boiling water reactors and pressurized heavy water reactors.

English (99 pp., 2 figs.; 2020) | ISBN 978-92-0-105719-8 | STI/PUB/1878 | €48.00

Design of the Reactor Core for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-52



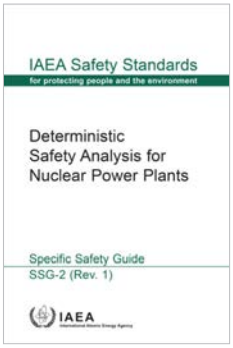
The reactor core is the central part of a nuclear reactor where nuclear fission occurs. It consists of four basic systems and components: the fuel (including fuel rods and the fuel assembly structure), the coolant, the moderator and the control rods, as well as additional structures such as reactor pressure vessel internals, core support plates, and the lower and upper internal structure in light water reactors. This Safety Guide provides recommendations on meeting the safety requirements established in IAEA Safety Standards Series No. SSR-2/1 (Rev. 1) Safety of Nuclear Power Plants: Design, applied to the design of the reactor core for nuclear power plants. The publication addresses the safety aspects of the core design and includes neutronic, thermohydraulic, thermomechanical, and structural mechanical aspects. Other aspects considered are those relating to reactor core control, shutdown and monitoring, and core management.

English (69 pp.; 2019) | ISBN 978-92-0-103819-7 | STI/PUB/1859 | €41.00

Deterministic Safety Analysis for Nuclear Power Plants

Specific Safety Guide

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



Deterministic safety analysis is an essential component of safety assessment, particularly for safety demonstration of the design of nuclear power plants (NPPs). The objective of deterministic safety analysis is to confirm that safety functions can be fulfilled and that the necessary structures, systems and components, in combination with operator actions, are effective in keeping the releases of radioactive material from the plant below acceptable limits. Deterministic safety analysis, supplemented by further specific information and analysis, including probabilistic safety analysis, is also intended to demonstrate that the source term and the potential radiological consequences of different plant states are acceptable, and that the possibility of certain conditions arising that could lead to an early or a large radioactive release can be considered as 'practically eliminated'. The publication has been updated to maintain consistency with current IAEA safety requirements and to reflect lessons from the Fukushima Daiichi accident. It takes into account current practices and experience from deterministic safety analyses for NPPs being performed around the world.

English (85 pp.; 2019) | ISBN 978-92-0-102119-9 | STI/PUB/1851 | €42.00

Establishing the Safety Infrastructure for a Nuclear Power Programme

Specific Safety Guide

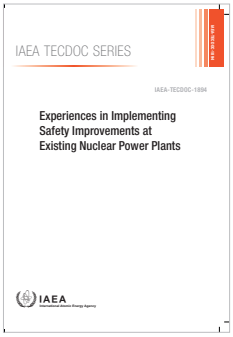
IAEA Safety Standards Series No. SSG-16 (Rev. 1)

This Safety Guide provides recommendations on the establishment of a framework for safety in accordance with the IAEA safety standards for States deciding on and preparing to embark on a nuclear power programme. In this regard, it proposes 197 safety related actions to be taken in the first three phases of the development of the nuclear power programme, to achieve the foundation for a high level of safety throughout the entire lifetime of the nuclear power plant (NPP). This includes safety in the construction, commissioning and operation of the NPP, and the associated management of radioactive waste and spent fuel, and safety in decommissioning. Thus, it contributes to the building of leadership and management for safety and of an effective safety culture and serves as guidance for self-assessment by all organizations involved in the development of a safety infrastructure.

English (Forthcoming) | ISBN 978-92-0-108919-9 | STI/PUB/1901 | €50.00

Experiences in Implementing Safety Improvements at Existing Nuclear Power Plants

IAEA TECDOC Series No. 1894



This publication provides an overview of the latest experiences of Member States in implementing safety improvements at existing nuclear power plants. It describes in detail many of the modifications and, more generally, Member States' strategies for identifying and implementing safety improvements at their facilities. The publication aims to support practitioners in the continuous evaluation of nuclear safety at nuclear power plants. Within this publication the reader can explore a variety of technical approaches taken in retrospective assessment of safety at existing nuclear power plants and implementing safety improvements through various processes.

English (266 pp., 73 figs; 2020) | ISBN 978-92-0-100720-9 | IAEA-TECDOC-1894 | €18.00

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

Specific Safety Guide

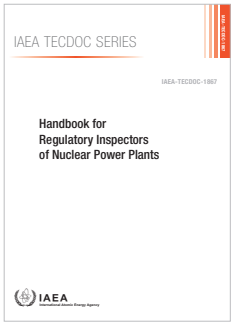
IAEA Safety Standards Series No. SSG-61

This Safety Guide provides recommendations on the structure and content of the safety analysis report to be submitted by the operating organization to the regulatory body for authorization of the siting, construction, commissioning, operation and decommissioning of a nuclear power plant. It is intended to facilitate both the development of the safety analysis report by the operating organization and the checking of its completeness and adequacy by the regulatory body. The publication is a revision of IAEA Safety Standards Series No. GS-G-4.1, Format and Content of the Safety Analysis Report for Nuclear Power Plants, which it supersedes. The revision reflects feedback experience from the Fukushima Daiichi accident and the subsequent stress tests performed. It also describes good practices and experience from the use of safety analysis reports for newly built nuclear power plants in different States and informs on recent progress made in approaches to safety assessment.

English (Forthcoming) | ISBN 978-92-0-106319-9 | STI/PUB/1884 | €52.00

Handbook for Regulatory Inspectors of Nuclear Power Plants

IAEA TECDOC Series No. 1867



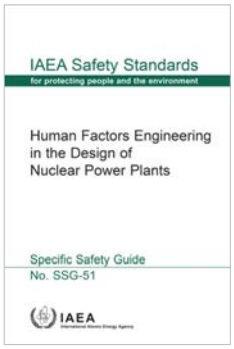
This publication addresses inspection basics, concepts and methods for planning inspection activities, performing inspections of safety related structures, systems and components, evaluating the safety significance of inspection findings, and documenting the results. It presents high level considerations for the inspection of selected programmatic areas including plant operations, radiation protection, fire protection and maintenance activities at nuclear power plants (NPPs). The publication focuses on the regulatory inspection of operating NPPs and, where applicable, describes how the same inspection techniques can be applied to facilities undergoing construction, preoperational testing and decommissioning. The general techniques described may also be used in the inspection of other types of nuclear facility.

English (114 pp., 15 figs; 2019) | ISBN 978-92-0-101519-8 | IAEA-TECDOC-1867 | €18.00

Human Factors Engineering in the Design of Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-51

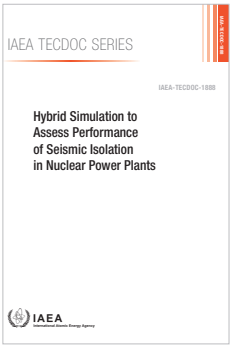


This publication provides recommendations and guidance for meeting Requirement 32 of IAEA Safety Standards Series No. SSR-2/1 (Rev. 1), Safety of Nuclear Power Plants: Design, for optimal operator performance involving systematic consideration of human factors, including the human–machine interface (HMI). The Safety Guide provides a structured approach and guidance on application of human factors engineering (HFE) in the design of the HMI, which is the basis for human physical and cognitive processes in nuclear power plants. It applies to application of HFE in the design, operation and maintenance of the HMI for new plants, as well as for modifications of the HMI of existing plants.

English (81 pp., 3 figs.; 2019) | ISBN 978-92-0-100419-2 | STI/PUB/1843 | €42.00

Hybrid Simulation to Assess Performance of Seismic Isolation in Nuclear Power Plants

IAEA TECDOC Series No.1888

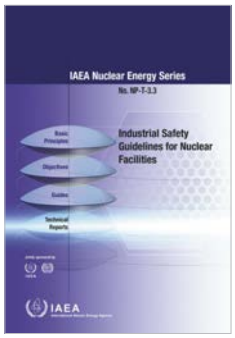


Seismic isolation technology has the potential to significantly reduce the overall risk to nuclear power plants posed by earthquake ground motions. A testing programme is an integral part of a seismic isolation project. Not only do the isolating devices need to be characterized for design purposes, but the analytical procedures used in design also need to be validated. Hybrid simulation is a testing technique which is a good candidate to experimentally assess the behaviour of an isolation system. The method combines the computation of the response of the isolated structure with the experimental determination of the behaviour of full-scale isolators under the demand imposed by the movement of ground and structure. This publication contributes to the assessment of the method as a tool for the design and safety demonstration of base-isolated nuclear facility buildings.

English (218 pp., 185 figs; 2019) | ISBN 978-92-0-162719-3 | IAEA-TECDOC-1888 | €18.00

Industrial Safety Guidelines for Nuclear Facilities

IAEA Nuclear Energy Series No. NP-T-3.3



These IAEA guidelines on industrial safety for nuclear facilities are co-sponsored by the International Labour Organization. Specific review of industrial safety practices at nuclear plants have been part of the IAEA OSART (Operational Safety Review Team) missions for decades, and supplementary guidance for such reviews has been available since 1990. This publication presents the latest good practices that nuclear organizations have put into place to implement high quality industrial safety programmes.

English (244 pp., 87 figs; 2018) | ISBN 978-92-0-101617-1 | STI/PUB/1774 | €60.00

International Conference on Operational Safety

Proceedings of an International Conference Held in Vienna, Austria, 23–26 June 2015

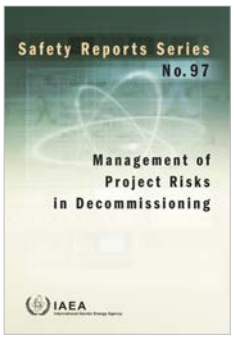
Proceedings Series

This proceedings publication presents the essential content of the 2015 IAEA international conference on the operational safety of nuclear power plants. Although conferences on this topic are conducted regularly, this was the first one after the earthquake in 2011 that caused the accident at the Fukushima Daiichi nuclear power plant. The conference brought together a broad range of participants including nuclear utilities, regulators, governments and academia. The topics covered operational safety, culture for safety, effective use of operating experience and the safety of long term operations, among others. A fresh perspective was added by representatives of other industries that deal with significant potential hazards. This publication, available exclusively in digital format, provides the reader with the opening and closing addresses, summaries of all sessions and the majority of the papers and posters accepted for the conference.

English (2018) | ISBN 978-92-0-152118-7 | STI/PUB/1826 | €20.00

Management of Project Risks in Decommissioning

Safety Reports Series No. 97



This Safety Report provides specific guidance on the management of project risks in decommissioning. The publication proposes a systematic and proactive approach to identifying, analysing, evaluating, and treating relevant project risks at strategic and operational levels, and provides examples of application of the proposed approach.

English (57 pp., 6 figs; 2019) | ISBN 978-92-0-108918-2 | STI/PUB/1839 | €35.00

Methodologies for Seismic Safety Evaluation of Existing Nuclear Installations

Safety Reports Series No. 103

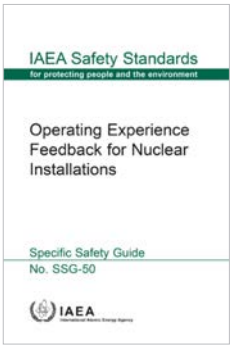
Experience shows that an assessment of the seismic capacity of an existing operating facility can be required for a number of reasons, for example identification of potential seismic vulnerabilities based on operating experience events or the periodic safety review programme. This publication covers the seismic safety evaluation programmes to be performed on existing nuclear installations in order to ensure that the required fundamental safety functions are available, with particular focus on the safe shutdown of reactors. It includes lessons learned based on the IAEA Action Plan on Nuclear Safety following the Fukushima Daiichi accident, and updated methodologies for seismic safety evaluation of nuclear installations.

English (Forthcoming) | ISBN 978-92-0-107219-1 | STI/PUB/1893 | €57.00

Operating Experience Feedback for Nuclear Installations

Specific Safety Guide

IAEA Safety Standards Series No. SSG-50

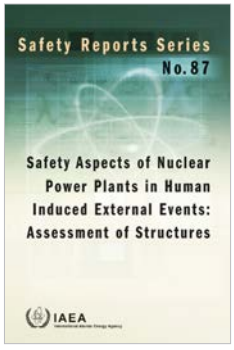


A robust operating experience programme prevents or minimizes the risk of future events by learning from events that have already occurred. This Safety Guide provides recommendations for establishing, implementing, assessing and continuously improving an operating experience programme for nuclear installations.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

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

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

Safety Reports Series No. 87



This publication provides detailed guidelines for the safety assessment of nuclear power structures against mechanical impact, explosion and fire caused by human induced external events. It covers the characterization of loading, the assessment of structural integrity using both simplified methods and more elaborate methodologies, and the assessment of induced vibration. The acceptance criteria provided in the publication are for different failure modes: overall stability, overall bending and shear, local failure modes and induced vibrations. The process of analysing fire consequences is also addressed.

English (204 pp., 71 figs; 2018) | ISBN 978-92-0-101117-6 | STI/PUB/1769 | €65.00

Site Evaluation for Nuclear Installations

Specific Safety Requirements

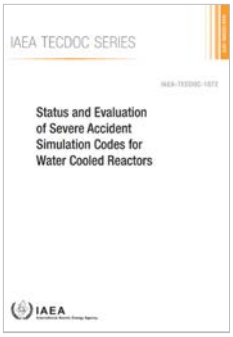
IAEA Safety Standards Series No. SSR-1

This Safety Requirements publication takes into account and incorporates developments relating to site evaluation for nuclear installations since the publication of IAEA Safety Standards Series No. NS-R-3 in 2003. It applies IAEA Safety Standards Series No. SF-1, Fundamental Safety Principles. Requirements for site evaluation are intended to contribute to the adequate protection of site personnel and the public, and protection of the environment from harmful effects of ionizing radiation arising from nuclear installations. It is recognized that there are steady advances in technology and scientific knowledge, in nuclear safety and in what is considered adequate protection. Safety requirements evolve with these advances, and this publication reflects the present consensus among States.

English (34 pp.; 2019) | ISBN 978-92-0-108718-8 | STI/PUB/1837 | €30.00

Status and Evaluation of Severe Accident Simulation Codes for Water Cooled Reactors

IAEA TECDOC Series No. 1872

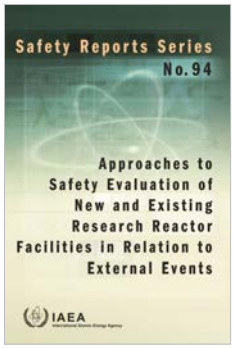


Accurate prediction of source term and modelling of severe accident progression by severe accident analysis codes are integral to the safe operation of water cooled reactors. The source term released to the environment during severe accidents, calculated by these codes, is used in specialized atmospheric transport models to evaluate the transport of radionuclides in the environment. Although severe accident codes are comprehensively validated based on experiments, disagreement among calculations performed using different codes for the same scenarios remains. Such differences and their causes are being explored by a number of organizations, including developers, through code to code benchmarks. Furthermore, severe accident phenomena model improvements are being made on the basis of insights from experiments and with the development of models to account for previously less understood phenomena. This publication summarizes the current status of severe accident analysis codes and identifies possible areas for research and development. The information is detailed in terms of major findings, identified gaps and recommended future actions.

English (96 pp., 3 figs; 2019) | ISBN 978-92-0-102919-5 | IAEA-TECDOC-1872 | €18.00

Approaches to Safety Evaluation of New and Existing Research Reactor Facilities in Relation to External Events

Safety Reports Series No. 94



This publication provides information and a framework for Member States to conduct realistic safety evaluation for research reactors in terms of external events. The publication provides information with examples on the use of a graded approach, based on the radiological hazard that a facility poses to the environment, the public and workers, and takes into account the lessons from the Fukushima Daiichi accident. This publication supports the development of site specific guidelines for the actual design and safety assessment, and should be used in conjunction with the relevant IAEA Safety Standards. It can also be used as training material for research reactor staff and for a self-assessment of the vulnerability of existing structures to external events.

English (113 pp., 9 figs; 2019) | ISBN 978-92-0-102617-0 | STI/PUB/1782 | €40.00

Benchmarking against Experimental Data of Neutronics and Thermohydraulic Computational Methods and Tools for Operation and Safety Analysis of Research Reactors

Results of a Coordinated Research Project

IAEA TECDOC Series No.1879

This publication presents the results of an IAEA coordinated research project (CRP). The benchmark analysis performed under this CRP covered steady state and transient conditions for research reactors across a range of designs, power levels, operating regimes and experimental facilities. The results obtained by the individual CRP participants are consolidated for each benchmark specification and conclusions are drawn on the specifications, modelling approaches and user effects, and computer codes used in the analysis. This publication supplements IAEA Technical Report Series No. 480, Research Reactor Benchmarking Database: Facility Specification and Experimental Data, which was developed within the same CRP. The publication is intended for use by operating organizations, researchers, regulatory bodies, designers and other interested parties involved in the safety, operation and utilization of research reactors. The individual country reports are available on the attached CD-ROM.

English (290 pp., 203 figs; 2019) | ISBN 978-92-0-109619-7 | IAEA-TECDOC-1879 | €18.00

Periodic Safety Review for Research Reactors

Safety Reports Series No. 99

This publication provides information and guidance on the establishment of a process for periodic safety review for research reactors, including preparation, conduct of the review and reporting of results. In addition, it covers the regulatory assessment of these results. The publication also provides information on the experience of Member States in establishing and implementing periodic safety reviews of research reactors, including implementation of reasonable and practical improvements based on these reviews.

English (Forthcoming) | ISBN 978-92-0-106819-4 | STI/PUB/1889 | €48.00

Decommissioning of Particle Accelerators

IAEA Nuclear Energy Series No. NW-T-2.9

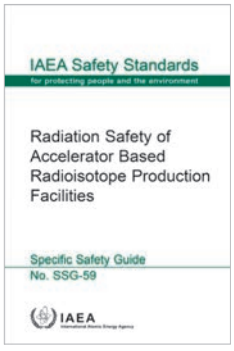
This publication presents information on experience and lessons learned from implementation of decommissioning projects for particle accelerators. Based on this information, and highlighting typical issues and concerns, the publication provides practical information for all those having a role in this process. The publication is written for operators of accelerator facilities, particularly those approaching the decommissioning stage, or maintaining a facility in a deferred dismantling state, as well as for regulators, waste managers, decision makers at government level, local authorities, decommissioning contractors and designers of accelerators. It is anticipated that the lessons learned described in this publication will contribute to decommissioning planning during the design stage of new facilities, hence minimizing the generation of radioactive waste without compromising structural characteristics and the effectiveness of the construction.

English (Forthcoming) | ISBN 978-92-0-102419-0 | STI/PUB/1854 | €46.00

Radiation Safety of Accelerator Based Radioisotope Production Facilities

Specific Safety Guide

IAEA Safety Standards Series No. SSG-59



Radioisotopes are used worldwide in a range of medical, industrial, research and academic applications. A large proportion of these radioisotopes are produced in particle accelerators and the number of institutions that operate linear accelerators or cyclotrons and manufacture and distribute radiopharmaceuticals, for example, is significant and increasing. The production of radioisotopes using particle accelerators poses significant radiation hazards to workers, members of the public, and the environment when accelerators are operated without adequate radiation safety measures. This Safety Guide provides practical guidance for implementing radiation protection and safety measures in such facilities involved in the production and use of radioisotopes.

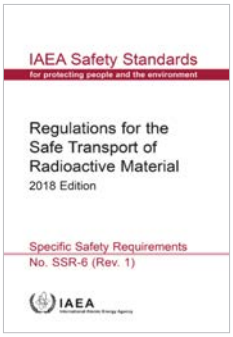
English (85 pp., 4 figs; 2020) | ISBN 978-92-0-105919-2 | STI/PUB/1880 | €42.00

Regulations for the Safe Transport of Radioactive Material

2018 Edition

Specific Safety Requirements

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



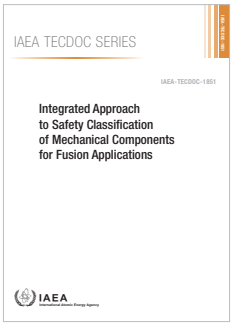
This publication is the latest edition of IAEA Safety Standards Series No. SSR-6, Regulations for the Safe Transport of Radioactive Material. It is supported by six IAEA Safety Guides which provide explanation and guidance for in requirements established in SSR-6 to facilitate harmonized implementation. The regulations apply to the transport of radioactive material by all modes on land, water or in the air, including transport that is incidental to the use of the radioactive material.

Arabic (162 pp., 7 figs; 2019) | ISBN 978-92-0-609618-5 | STI/PUB/1798 | €49.00
Chinese (161 pp., 7 figs; 2019) | ISBN 978-92-0-509018-4 | STI/PUB/1798 | €49.00
English (165 pp., 7 figs; 2018) | ISBN 978-92-0-107917-6 | STI/PUB/1798 | €49.00
French (173 pp., 7 figs; 2019) | ISBN 978-92-0-209718-6 | STI/PUB/1798 | €49.00
Russian (193 pp., 7 figs.; 2019) | ISBN 978-92-0-409118-2 | STI/PUB/1798 | €49.00
Spanish (171 pp., 7 figs.; 2019) | ISBN 978-92-0-309818-2 | STI/PUB/1798 | €49.00

FUSION REACTORS

Integrated Approach to Safety Classification of Mechanical Components for Fusion Applications

IAEA TECDOC Series No. 1851



This TECDOC is the first publication on safety classification of components for fusion applications. It highlights the existing differences between fission and fusion reactors in identification and classification of structures, systems and components that are important to safety and offers information on fusion applications. The publication also provides information on inclusion of the new design extension conditions, which have been added after the review of IAEA Safety Guides following the Fukushima Daiichi nuclear power plant accident.

English (130 pp., 26 figs; 2018) | ISBN 978-92-0-105518-7 | IAEA-TECDOC-1851 | €18.00

WASTE REPOSITORIES

Storage of Spent Nuclear Fuel

Specific Safety Guide

IAEA Safety Standards Series No. SSG-15 (Rev. 1)

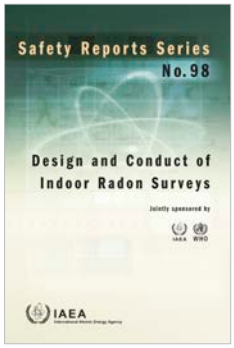
This publication is a revision by amendment of IAEA Safety Standards Series No. SSG-15 and provides recommendations and guidance on the storage of spent nuclear fuel. It covers all types of storage facility and all types of spent fuel from nuclear power plants and research reactors. It takes into consideration the longer storage periods beyond the original design lifetime of the storage facility that have become necessary owing to delays in the development of disposal facilities and the reduction in reprocessing activities. It also considers developments associated with nuclear fuel, such as higher enrichment, mixed oxide fuels and higher burnup. Guidance is provided on all stages in the lifetime of a spent fuel storage facility, from planning through siting and design to operation and decommissioning. The revision was undertaken by amending, adding and/or deleting specific paragraphs addressing recommendations and findings from studying the accident at the Fukushima Daiichi nuclear power plant in Japan.

English (Forthcoming) | ISBN 978-92-0-106119-5 | STI/PUB/1882 | €42.00

RADIATION PROTECTION

Design and Conduct of Indoor Radon Surveys

Safety Reports Series No. 98

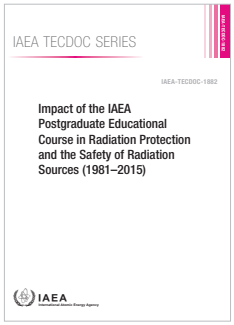


This Safety Report draws on the requirements of international standards and the recommendations of international organizations as well as on the scientific literature, together with direct experience from a number of IAEA Member States in relation to carrying out representative indoor radon surveys. The need for and the purpose of representative indoor radon surveys are discussed, as are the factors that must be considered in designing and carrying out such surveys. How the measurement data obtained from indoor radon surveys can be used to develop radon risk maps is also considered. While the Safety Report is focused specifically on national and regional surveys to evaluate average concentrations of radon in dwellings, many of the same considerations also apply to radon surveys for other types of buildings.

English (110 pp; 2019) | ISBN 978-92-0-101019-3 | STI/PUB/1848 | €40.00

Impact of the IAEA Postgraduate Educational Course in Radiation Protection and the Safety of Radiation Sources (1981–2015)

IAEA TECDOC Series No.1882



This publication presents the results of the impact evaluation of one of the IAEA's flagship courses in radiation safety, the postgraduate educational course in radiation protection and the safety of radiation sources (PGEC). This course is hosted in the IAEA regional training centres. The impact evaluation covers a period of 35 years, surveying the PGEC participants from past courses taking place since 1981: this represents a rather unique case of a systematic evaluation of a training programme. The publication provides an overview of the PGEC impact on participants' professional development and career, and on the radiation safety infrastructure at organizational and national levels. Overall results of the impact evaluation are presented at regional level (Africa, Asia and the Pacific, Europe, and Latin America and the Caribbean), as well as globally.

English (92 pp., 51 figs; 2019) | ISBN 978-92-0-159319-1 | IAEA-TECDOC-1882 | €18.00

Medical Management of Radiation Injuries

Safety Reports Series No. 101

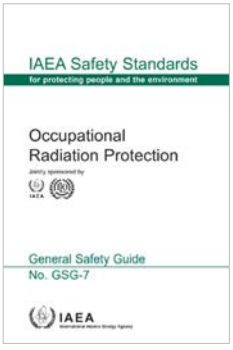
This manual focuses on the medical management of individuals involved in radiation emergencies, especially those who have been exposed to high doses of ionizing radiation. Its primary objective is to provide practical information, to be used for treatment decisions by medical personnel during a radiation emergency. It also addresses general and specific measures for the medical management of individuals who have been internally contaminated with radionuclides. This publication is complementary to other publications developed by the IAEA in the medical area of radiation emergencies.

English (98 pp., 13 figs; 2020) | ISBN 978-92-0-107019-7 | STI/PUB/1891 | €57.00

Occupational Radiation Protection

General Safety Guide

IAEA Safety Standards Series No. GSG-7

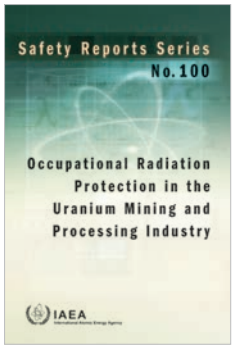


This Safety Guide, prepared jointly by the International Atomic Energy Agency (IAEA) and the International Labour Organization (ILO), provides guidance on fulfilling the requirements of the International Basic Safety Standards (IAEA Safety Standards Series No. GSR Part 3) with respect to occupational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

English (335 pp., 9 figs; 2018) | ISBN 978-92-0-102917-1 | STI/PUB/1785 | €58.00
Spanish (Forthcoming) | ISBN 978-92-0-308119-1 | STI/PUB/1785 | €58.00

Occupational Radiation Protection in the Uranium Mining and Processing Industry

Safety Reports Series No. 100



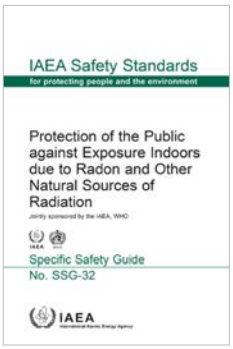
This Safety Report has been developed as part of the IAEA programme on occupational radiation protection to provide for the application of its safety standards in implementing a graded approach to the protection of workers against exposures associated with uranium mining and processing. The publication describes the methods of production associated with the uranium industry and provides practical information on the radiological risks to workers in the exploration, mining and processing of uranium. It is a compilation of detailed information on uranium mining and processing stages and techniques, general radiation protection considerations in the relevant industry, general methodologies applicable for control, monitoring and dose assessment, exposure pathways, and radiation protection programmes for a range of commonly used mining and processing techniques..

English (217 pp., 31 figs.; 2020) | ISBN 978-92-0-106919-1 | STI/PUB/1890 | €65.00

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

Specific Safety Guide

IAEA Safety Standards Series No. SSG-32



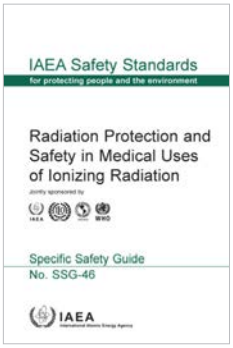
This Safety Guide provides recommendations on meeting the requirements established in the IAEA International Basic Safety Standards, for protection of the public against exposure indoors due to natural sources of radiation. Guidance is provided on the application of the requirements for justification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

English (90 pp., 4 figs; 2015) | ISBN 978-92-0-102514-2 | STI/PUB/1651 | €45.00
Spanish (98 pp., 4 figs; 2018) | ISBN 978-92-0-302117-3 | STI/PUB/1651 | €45.00

Radiation Protection and Safety in Medical Uses of Ionizing Radiation

Specific Safety Guide

IAEA Safety Standards Series No. SSG-46



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

English (318 pp., 2 figs; 2018) | ISBN 978-92-0-101717-8 | STI/PUB/1775 | €54.00

Radiation Protection and Safety in Veterinary Medicine

Safety Reports Series No. 104

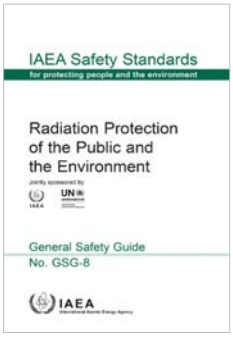
This Safety Report provides guidance on the safe use of radiation for imaging and treatment in veterinary medicine with the objective of ensuring the safety and radiation protection of workers and members of the public. The publication addresses occupational exposure and public exposure in the use of radiation in veterinary medicine and safety issues that should be considered in order to be compliant with the International Basic Safety Standards (IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards). Consideration is given to the topics of source security and emergency response that might arise with the use of radioactive material in veterinary medicine. Although primarily intended for regulators and workers in veterinary medicine, the publication will also have relevance for professional bodies, ethics committees and suppliers of equipment and software.

English (Forthcoming) | ISBN 978-92-0-107319-8 | STI/PUB/1894 | €75.00

Radiation Protection of the Public and the Environment

General Safety Guide

IAEA Safety Standards Series No. GSG-8



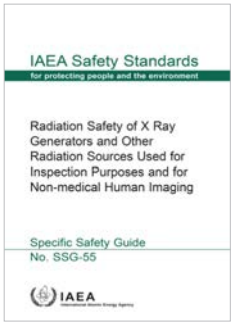
This Safety Guide provides guidance on the implementation of the requirements in IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, in relation to protection of the public and the environment against radiation risks.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

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

Radiation Safety of X Ray Generators and Other Radiation Sources Used for Inspection Purposes and for Non-medical Human Imaging

Specific Safety Guide

IAEA Safety Standards Series No. SSG-55



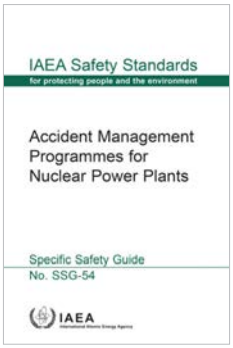
This Safety Guide provides recommendations on specific safety measures to meet the requirements of IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, and other relevant Safety Requirements publications on the use of X ray generators and other types of radiation source that are used for inspection purposes and for non-medical human imaging. The recommendations provided are primarily for organizations that are authorized to use X ray generators and other types of radiation source for such purposes, as well as for radiation protection experts, radiation protection officers and staff of regulatory bodies. The publication may also be of interest to designers and manufacturers of relevant X ray generators and sources.

English (110 pp, 2 figs; 2020) | ISBN 978-92-0-102219-6 | STI/PUB/1852 | €32.00

Accident Management Programmes for Nuclear Power Plants

Specific Safety Guide

IAEA Safety Standards Series No. SSG-54



Accident management is an essential component of nuclear power plant safety and this Safety Guide provides recommendations on how to establish and maintain an effective accident management programme. Included in the publication are sections covering topics such as the identification of plant vulnerabilities and capabilities, development strategies, verification and validation, training and interfaces with emergency preparedness and response. Compared with the 2009 version, this publication enhances recommendations related to the instrumentation that would be used during accident management and includes a new chapter on the execution of the accident management programme.

English (81 pp., 3 figs; 2019) | ISBN 978-92-0-108318-0 | STI/PUB/1834 | €43.00

Arrangements for Public Communication in Preparedness and Response for a Nuclear or Radiological Emergency

General Safety Guide

IAEA Safety Standards Series No. GSG-14

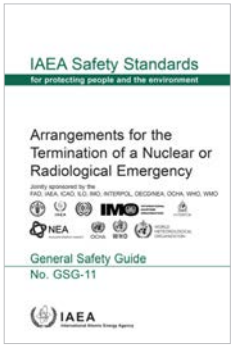
This Safety Guide supports Member States in developing arrangements for communicating with the public and media and coordinating official information in the response to a nuclear or radiological emergency. These arrangements facilitate the successful implementation of protective actions and the delivery of consistent messages. Specifically, the Safety Guide describes the infrastructure and processes needed to provide useful, timely, truthful, consistent, clear and appropriate information to the public in the event of a nuclear or radiological emergency; respond to incorrect information and rumors; and respond to requests for information from the public and from the news and information media. It will help ensure effective and uniform public information and media communications arrangements during nuclear and radiological emergencies. The guidance is applicable for such emergencies, irrespective of the initiator whether that be natural event, human error, mechanical or other failure or a nuclear security event.

English (74 pp., 2 figs; 2020) | ISBN 978-92-0-109019-5 | STI/PUB/1902 | €48.00

Arrangements for the Termination of a Nuclear or Radiological Emergency

General Safety Guide

IAEA Safety Standards Series No. GSG-11

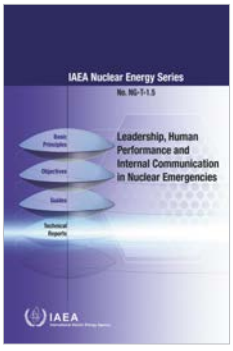


This publication provides guidance and recommendations on arrangements to be made at the preparedness stage, as part of overall emergency preparedness, for the termination of a nuclear or radiological emergency and the subsequent transition from the emergency exposure situation to either a planned exposure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

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

Leadership, Human Performance and Internal Communication in Nuclear Emergencies

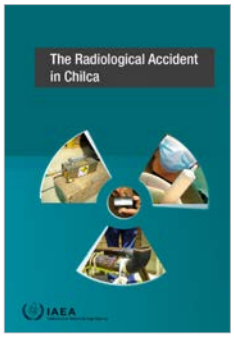
IAEA Nuclear Energy Series No. NG-T-1.5



This publication focuses on the challenges and their possible solutions in the areas of leadership, human performance and internal communication in a severe nuclear emergency. It presents a brief overview of some of the key concepts, especially how they relate to an organization's ability to successfully manage an emergency event. The target audience for this publication are those officials and senior managers dealing with emergency response in the operating organization, government, local authorities and the regulatory body. Those who have an influence on the style of leadership and personnel development and training that is applied in their organizations and who are involved in emergency preparedness and response will also benefit from this publication.

English (36 pp., 2 figs; 2018) | ISBN 978-92-0-103317-8 | STI/PUB/1789 | €30.00

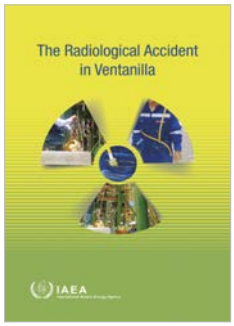
The Radiological Accident in Chilca



Under the Convention on Assistance in the Case of a Nuclear or Radiological Emergency, the Peruvian authorities requested assistance from the IAEA in relation to the radiological accident that occurred during non-destructive testing using a nuclear radioactive source in the district of Chilca, Peru, in 2012. This assistance related to dose assessment and medical management of those involved in the accident was provided during 2012 and 2013. The report gives a detailed account and analysis of the event, as well as, the actions taken in order to assist organizations responsible for radiation protection, source safety and emergency preparedness and response in identifying lessons to be learned that may help to prevent similar accidents.

English (113 pp.; 63 figs; 2018) | ISBN 978-92-0-101817-5 | STI/PUB/1776 | €35.00

The Radiological Accident in Ventanilla



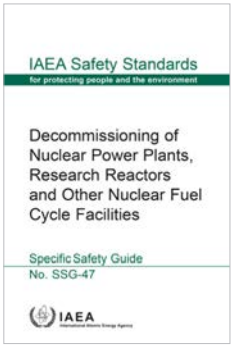
This publication addresses the chronology of events and circumstances of the radiological accident in Ventanilla, Peru, in February 2014. The information includes a detailed description of the international assistance provided by the IAEA, and the health consequences and dose assessment for, and the medical management of the affected individual. This information and the lessons learned from the accident, relating to its circumstances, the notification, medical response, dose assessment and response at national and international levels are key aspects for Member States to consider when analysing their response procedures for radiological emergencies. The intention is to aid the and identification of necessary actions to be implemented in order to avoid or prevent potential similar accidents.

English (69 pp., 30 figs; 2019) | ISBN 978-92-0-106619-0 | STI/PUB/1887 | €30.00

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

Specific Safety Guide

IAEA Safety Standards Series No. SSG-47

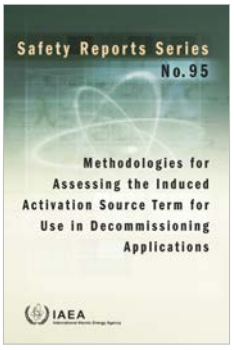


Decommissioning is the last step in the lifetime management of an authorized facility and it must be considered during the design, construction, commissioning and operation of such facilities. This publication provides guidance on how to comply with requirements for the safe decommissioning of nuclear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

English (99 pp., 1 fig.; 2018) | ISBN 978-92-0-104118-0 | STI/PUB/1812 | €40.00

Methodologies for Assessing the Induced Activation Source Term for Use in Decommissioning Applications

Safety Reports Series No. 95



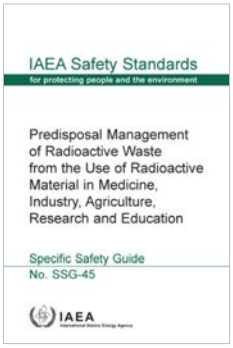
For proper planning and safe implementation of decommissioning of facilities, an accurate estimate of the radioactive inventory of the facility is needed (i.e. source term determination). The largest fraction of this inventory for nuclear power plants, research reactors and accelerator facilities is created by induced activation by neutrons or other particles (protons, electrons, ions). This publication provides information for facility operators and regulatory authorities involved in decommissioning planning and oversight of the process of assessment of the induced activation source term of a facility. It provides information on the selection and application of methodologies for the assessment of the induced activation source term for decommissioning purposes and provides an overview of the approaches and practices currently available.

English (112 pp., 33 figs; 2019) | ISBN 978-92-0-102918-8 | STI/PUB/1823 | €46.00

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

Specific Safety Guide

IAEA Safety Standards Series No. SSG-45



This Safety Guide is applicable to the predisposal management of radioactive waste derived from the use of radioactive materials in medicine, industry, agriculture, research and education, including disused sealed radioactive sources. It focuses on waste generated at facilities such as hospitals and research centres, where radioactive waste is not usually generated in bulk quantities. It covers the managerial, administrative and technical issues associated with the safe management of radioactive waste, from its generation to its acceptance at a disposal facility or its release from regulatory control.

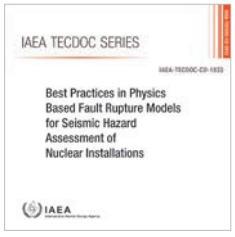
English (112 pp., 6 figs; 2019) | ISBN 978-92-0-111316-0 | STI/PUB/1758 | €40.00

SAFETY ASSESSMENT

Best Practices in Physics Based Fault Rupture Models for Seismic Hazard Assessment of Nuclear Installations

Proceedings of a Workshop Held in Vienna, 18–20 November 2015

IAEA TECDOC Series No. 1833



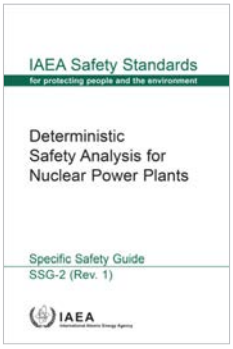
These proceedings present the outcomes of a workshop convened by the IAEA in 2015. The workshop brought together experts in seismology and earthquake engineering to discuss the applicability of the so called physics based fault rupture models to generate synthetic earthquake ground motion data for meaningful extrapolation of ground motion prediction in areas where there is a lack of sufficient observations. Fault rupture modelling is recommended for estimating strong motion in cases where nearby faults contribute significantly to the seismic hazard for nuclear installations. The overall aspects and process of the modelling and ground motion simulation are described in IAEA Safety Standards Series No. SSG-9, Seismic Hazards in Site Evaluation for Nuclear Installations, published in 2010. However, after the massive earthquake in Japan in 2011, there has been further progress in physics based fault rupture modelling. Therefore, the IAEA arranged this workshop and the publication arising from it. The intention is to provide practical, up-to-date information contributing to effective seismic hazard analysis.

English (2018) | ISBN 978-92-0-158917-0 | IAEA-TECDOC-CD-1833 | €18.00

Deterministic Safety Analysis for Nuclear Power Plants

Specific Safety Guide

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



Deterministic safety analysis is an essential component of safety assessment, particularly for safety demonstration of the design of nuclear power plants (NPPs). The objective of deterministic safety analysis is to confirm that safety functions can be fulfilled and that the necessary structures, systems and components, in combination with operator actions, are effective in keeping the releases of radioactive material from the plant below acceptable limits. Deterministic safety analysis, supplemented by further specific information and analysis, including probabilistic safety analysis, is also intended to demonstrate that the source term and the potential radiological consequences of different plant states are acceptable, and that the possibility of certain conditions arising that could lead to an early or a large radioactive release can be considered as 'practically eliminated'. The publication has been updated to maintain consistency with current IAEA safety requirements and to reflect lessons from the Fukushima Daiichi accident. It takes into account current practices and experience from deterministic safety analyses for NPPs being performed around the world.

English (85 pp; 2019) | ISBN 978-92-0-102119-9 | STI/PUB/1851 | €42.00

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

Specific Safety Guide

IAEA Safety Standards Series No. SSG-61

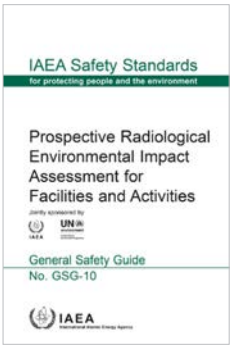
This Safety Guide provides recommendations on the structure and content of the safety analysis report to be submitted by the operating organization to the regulatory body for authorization of the siting, construction, commissioning, operation and decommissioning of a nuclear power plant. It is intended to facilitate both the development of the safety analysis report by the operating organization and the checking of its completeness and adequacy by the regulatory body. The publication is a revision of IAEA Safety Standards Series No. GS-G-4.1, Format and Content of the Safety Analysis Report for Nuclear Power Plants, which it supersedes. The revision reflects feedback experience from the Fukushima Daiichi accident and the subsequent stress tests performed. It also describes good practices and experience from the use of safety analysis reports for newly built nuclear power plants in different States and informs on recent progress made in approaches to safety assessment.

English (Forthcoming) | ISBN 978-92-0-106319-9 | STI/PUB/1884 | €52.00

Prospective Radiological Environmental Impact Assessment for Facilities and Activities

General Safety Guide

IAEA Safety Standards Series No. GSG-10



This Safety Guide provides recommendations and guidance on a general framework for performing prospective radiological impact assessments for facilities and activities, to estimate and control the radiological effects on the public and on the environment. The situations covered in the assessment include both exposures expected to occur in normal operation as well as potential exposures. Guidance is provided on the assumptions and input data to be used, the necessary models for environmental transfer and radiation dose assessment and the definition and use of criteria for informing decisions.

English (82 pp., 5 figs; 2018) | ISBN 978-92-0-102518-0 | STI/PUB/1819 | €42.00

Safety Analysis and Licensing Documentation for Nuclear Fuel Cycle Facilities

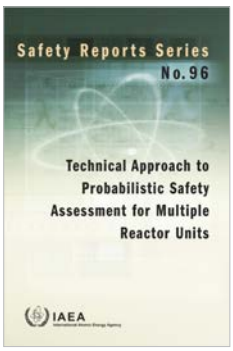
Safety Reports Series No. 102

This publication gives practical information on and examples of safety analysis principles and methods as well as the contents of licensing documentation needed to support application of IAEA safety standards to nuclear fuel cycle facilities. A systematic methodology is presented, covering the establishment of acceptance criteria, hazard evaluation, identification of postulated initiating events, analysis of accident sequences and consequences. Information is also provided on application of the results of the safety analysis in the design and operational phases, and on appropriate management system processes. The publication applies to all lifetime stages of relevant facilities and for modifications and upgrades. The information presented may be used for periodic safety reviews and consideration of extended lifetime of facilities. With respect to licensing documentation, the publication provides indicative contents and format of the safety analysis report as a higher level document that incorporates the information required at various steps in the licensing and relicensing process.

English (123 pp., 1 fig.; 2020) | ISBN 978-92-0-107119-4 | STI/PUB/1892 | €40.00

Technical Approach to Probabilistic Safety Assessment for Multiple Reactor Units

Safety Reports Series No. 96



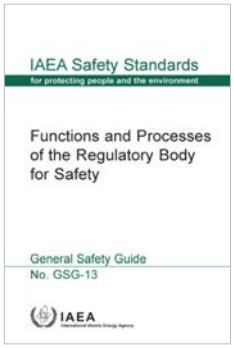
The technical approach described in this publication builds on the use of a single unit probabilistic safety assessment (PSA) and identifies considerations that are needed from the multi-unit perspective. This is the first attempt to expand the current PSA process to take account of multi-unit issues, and have been done by distilling lessons learned from the Fukushima Daiichi accident and other multi-unit events, and by reviewing previous PSAs and supporting research that have addressed the risks of multi-unit accidents. The publication provides a roadmap and methodology for performing a multi-unit PSA, proposes a set of site level risk metrics, and presents examples of approaches to resolve specific issues.

English (171 pp., 31 figs; 2019) | ISBN 978-92-0-102618-7 | STI/PUB/1820 | €70.00

Functions and Processes of the Regulatory Body for Safety

General Safety Guide

IAEA Safety Standards Series No. GSG-13

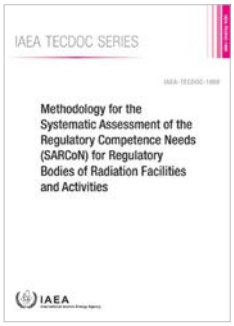


This Safety Guide provides recommendations on meeting the requirements of IAEA Safety Standards Series No. GSR Part 1 (Rev. 1), Governmental, Legal and Regulatory Framework for Safety, on the regulatory body's core functions and associated regulatory processes. This guidance is particularly important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

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

Methodology for the Systematic Assessment of the Regulatory Competence Needs (SARCoN) for Regulatory Bodies of Radiation Facilities and Activities

IAEA TECDOC Series No. 1860



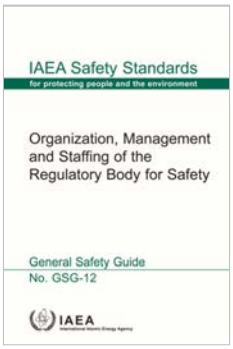
The IAEA has introduced a methodology and an assessment tool – Systematic Assessment of Regulatory Competence Needs (SARCoN) – which provides practical guidance on analysing the training and development needs of a regulatory body and, through a gap analysis, guidance on establishing competence needs and how to meet them. The current publication provides information on the use of the SARCoN methodology to support the implementation of the IAEA safety standards for ensuring regulatory competence in respect of radiation facilities and activities. It is to be used in conjunction with IAEA Safety Reports Series No. 79. It can also be used in conjunction with IAEA TECDOC-1757 by regulatory bodies regulating both radiation and nuclear facilities.

English (56 pp., 7 figs; 2019) | ISBN 978-92-0-109418-6 | IAEA-TECDOC-1860 | €18.00

Organization, Management and Staffing of the Regulatory Body for Safety

General Safety Guide

IAEA Safety Standards Series No. GSG-12



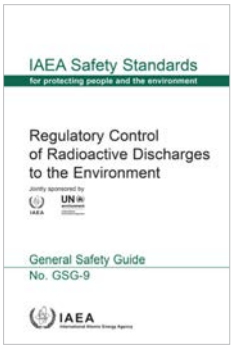
This publication provides recommendations on meeting the requirements of IAEA Safety Standards Series No. GSR Part 1 (Rev. 1), Governmental, Legal and Regulatory Framework for Safety, in respect of the organizational structure, management and staffing of the regulatory body. It addresses the arrangements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

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

Regulatory Control of Radioactive Discharges to the Environment

General Safety Guide

IAEA Safety Standards Series No. GSG-9

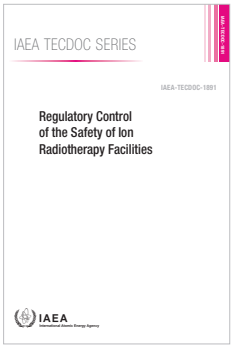


This Safety Guide is intended to assist governments, regulatory bodies, applicants for a licence and operating organizations with a structured approach to controlling radiation exposures of the public resulting from discharges from normal operations of facilities and activities, and with the optimization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

English (71 pp., 5 figs; 2018) | ISBN 978-92-0-102418-3 | STI/PUB/1818 | €42.00

Regulatory Control of the Safety of Ion Radiotherapy Facilities

IAEA TECDOC Series No.1891

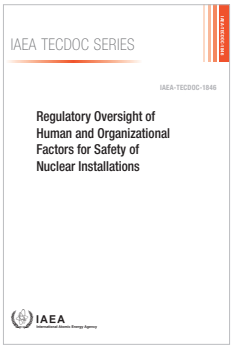


This publication summarizes the best international practices related to the regulatory control of radiotherapy facilities using ion accelerators. It provides information on facility authorization and inspection, as well as technical safety aspects that are typical and significant for ion accelerators.

English (124 pp., 27 figs; 2020) | ISBN 978-92-0-163119-0 | IAEA-TECDOC-1891 | €18.00

Regulatory Oversight of Human and Organizational Factors for Safety of Nuclear Installations

IAEA TECDOC Series No. 1846



Written for use by regulatory bodies and their technical support organizations, and those individuals supporting human performance activities and programmes, this publication addresses the definition and implementation of an oversight programme that adequately takes into account human and organizational factors to oversee safety throughout the lifetime of nuclear installations. A key concept is that safety is the result of interaction between humans, technology and the organization. Based on the outcome of several international meetings, this publication presents the main elements to be used to enhance regulatory oversight capabilities and describes the essential concepts and terms used in the area of human and organizational factors. It is intended to help in the development of regulations and guides related to human and organizational factors, stressing the key role of the licensee's management system in establishing and maintaining conditions to support people at work. The TECDOC describes ways to verify compliance with regulatory requirements related to human and organizational factors, as well as ways to better understand human and organizational factors associated trends and conclusions, using an integrated safety assessment approach.

English (66 pp., 3 figs; 2018) | ISBN 978-92-0-103318-5 | IAEA-TECDOC-1846 | €18.00

Technical and Scientific Support Organizations Providing Support to Regulatory Functions

IAEA TECDOC Series No. 1835

This publication introduces the general principles underlying the provision of technical and scientific support to a regulatory body and the characteristics of organizations providing such support. It describes the services provided to support regulatory functions as well as the associated activities and processes to maintain the needed level of expertise, state of the art tools and equipment. It is the first IAEA publication dedicated to the specific practices and challenges to be met by the technical and scientific support organizations.

English (64 pp., 6 figs; 2018) | ISBN 978-92-0-109117-8 | IAEA-TECDOC-1835 | €18.00

NUCLEAR SECURITY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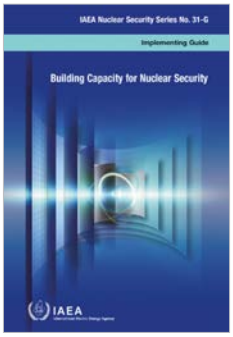
Building Capacity for Nuclear Security

Implementing Guide

IAEA Nuclear Security Series No. 31-G



Each State has the primary responsibility to build the capacity of organizations and people in order to develop, implement, and sustain a nuclear security regime. To discharge its responsibilities, the State has to strengthen its capacity at national, organizational and individual levels. Specifically, the State has to be able to enhance the competences and capabilities of relevant stakeholders in fulfilling their responsibilities within the nuclear security regime. Such endeavour involves various elements in capacity building, ranging from education and training to the development of a knowledge network. This publication is intended to serve as a reference for Member States to develop a national capacity building strategy for nuclear security. It addresses all organizations involved in nuclear security and reflects the multidisciplinary and cross-institutional nature of this task, as well as the long term efforts that are required.

English (62 pp; 2018) | ISBN 978-92-0-111916-2 | STI/PUB/1764 | €40.00

Computer Security Aspects of Design for Instrumentation and Control Systems at Nuclear Power Plants

IAEA Nuclear Energy Series No. NR-T-3.30

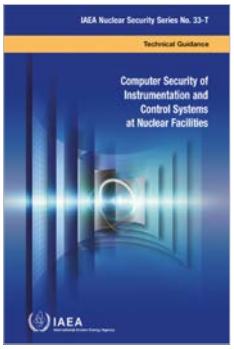
The transition to digital technology has changed the nature of instrumentation and control (I&C) systems by enabling extensive interconnection of reprogrammable, functionally interdependent I&C systems. This development has made computer security a necessary element for consideration in I&C system design. The benefits and challenges of the various computer security methods and controls with their implementation in nuclear power plant I&C systems are discussed and described in this publication. The publication provides an overview of current knowledge, up to date good practices, experience, and benefits and challenges related to the application of computer security measures. It defines the key concepts for computer security for I&C systems at nuclear facilities, explains the risk informed approach to computer security and describes how computer security measures are applied throughout the I&C system life cycle. Situations where I&C systems are interconnected with enterprise management systems are also addressed. The three appendices present case studies with practical application examples.

English (Forthcoming) | ISBN 978-92-0-104919-3 | STI/PUB/1870 | €35.00

Computer Security of Instrumentation and Control Systems at Nuclear Facilities

Technical Guidance

IAEA Nuclear Security Series No. 33-T



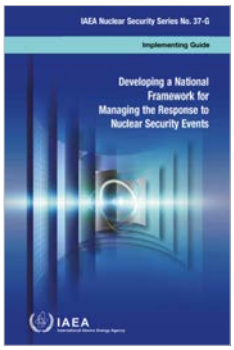
Computer security as a discipline is challenged by increasing threat vectors targeting a dynamic technological environment. This publication establishes guidance addressing the challenge of applying computer security measures to instrumentation and control (I&C) systems at nuclear facilities. The measures are intended to protect these I&C systems throughout their entire life cycles against malicious acts perpetrated by threat actors. The technical basis and methodologies for the application of these computer security measures are considered. The publication also addresses the application of such measures to the development, simulation and maintenance environments of these I&C systems. In addition, account is taken of developments in human factors engineering and nuclear safety. This Technical Guidance references and takes into account other Safety Guides and IAEA Nuclear Security Series publications that provide guidance relating to I&C design.

English (58 pp.; 2018) | ISBN 978-92-0-103117-4 | STI/PUB/1787 | €42.00

Developing a National Framework for Managing the Response to Nuclear Security Events

Implementing Guide

IAEA Nuclear Security Series No. 37-G



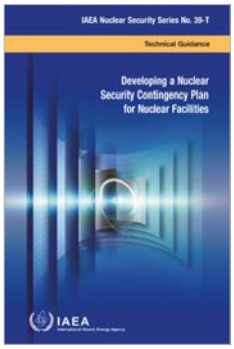
This publication provides guidance to States on the development, implementation, maintenance and sustainment of a national framework for managing the response to nuclear security events. Such a framework involves a structure and a set of principles and agreements around which a State can frame its nuclear security response functions, addressing the interfaces which need to exist between responding agencies to ensure effective, coordinated response. By using this Implementing Guide, a State will ensure that it has considered all relevant key issues as it develops its national framework for responding to nuclear security events.

English (42 pp., 5 figs; 2020) | ISBN 978-92-0-105519-4 | STI/PUB/1876 | €30.00

Developing a Nuclear Security Contingency Plan for Nuclear Facilities

Technical Guidance

IAEA Nuclear Security Series No. 39-T



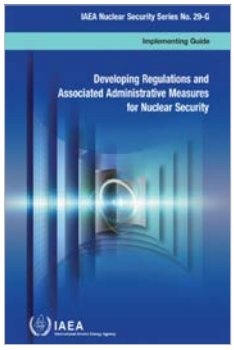
This publication provides guidance to States, competent authorities and operators on how to develop and maintain contingency plans for nuclear facilities. It can be used as a starting point for organizations that have not previously prepared or developed contingency plans, as well as a reference for organizations that wish to validate or improve their existing contingency plans. It is intended for use by senior managers and security specialists charged with developing such plans and by competent authorities responsible for their oversight.

English (33 pp; 2019) | ISBN 978-92-0-105219-3 | STI/PUB/1873 | €30.00

Developing Regulations and Associated Administrative Measures for Nuclear Security

Implementing Guide

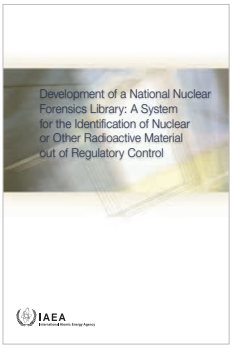
IAEA Nuclear Security Series No. 29-G



This publication aims to assist States in identifying the responsibilities of those involved in nuclear security so that suitable regulations, agreements and associated administrative measures may be developed for establishing and sustaining an effective nuclear security regime. The publication is structured to provide an overview of the most important aspects to be covered by a State's legislative and regulatory framework for governing nuclear security. States may therefore use this publication to undertake a gap analysis of their legislative and regulatory framework for nuclear security in order to take actions to update their framework as necessary.

English (60 pp.; 2018) | ISBN 978-92-0-111716-8 | STI/PUB/1762 | €39.00

Development of a National Nuclear Forensics Library: A System for the Identification of Nuclear or Other Radioactive Material out of Regulatory Control



This publication provides the rationale for the development of a national nuclear forensics library and addresses how a State may use such a national system in investigations of nuclear and other radioactive material out of regulatory control. It seeks to assist States that choose to develop such a library tailored to their individual circumstances, national legal requirements, and security needs.

English (52 pp., 4 figs; 2018) | ISBN 978-92-0-108218-3 | IAEA-TDL-009 | €18.00

Enhancing Nuclear Security Culture In Organizations Associated With Nuclear and Other Radioactive Material

Technical Guidance

IAEA Nuclear Security Series No. 38-T

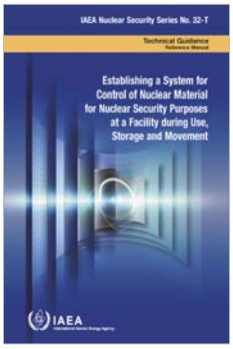
Nuclear security culture is an important component of an effective nuclear security regime, as it serves as a tool to improve the performance of the human component at nuclear facilities and organizations to counter both insider and outsider threats. Security culture connotes not only the technical proficiency of the people but also their awareness of security risks and motivation to follow established procedures, comply with regulations, and take the initiative when unforeseen circumstances arise. A workforce made up of individuals who are vigilant, who question irregularities, execute their work diligently and exhibit high standards of personal and collective behaviour is able to achieve effective nuclear security. Building upon this understanding of the importance of a strong nuclear security culture, this publication provides practical guidance on how to implement a systematic nuclear security culture enhancement programme.

English (Forthcoming) | ISBN 978-92-0-105319-0 | STI/PUB/1874 | €69.00

Establishing a System for Control of Nuclear Material for Nuclear Security Purposes at a Facility during Use, Storage and Movement

Technical Guidance

IAEA Nuclear Security Series No. 32-T



Control of nuclear material comprises the administrative and technical measures applied to ensure that nuclear material is not misused or removed from its assigned location without approval and/or without proper accounting. This publication, which builds upon the Implementing Guide IAEA Nuclear Security Series No. 25-G, focuses on the control of nuclear material during storage, use and movement using a facility's nuclear material accounting and control (NMAC) system. It describes practical measures for controlling nuclear material for nuclear security purposes during all activities at a facility, including movements, and how to use a graded approach in applying such measures. The technical guidance provided on how to use individual elements of the NMAC system is targeted at States and their competent authorities, but will be also useful for persons responsible for designing, operating and assessing nuclear security systems; physical protection of nuclear facilities and nuclear security management. It will also be of interest to operators and managers of NMAC systems; as well as for those preparing associated regulations; and persons responsible for computer security at nuclear facilities.

English (47 pp.; 2019) | ISBN 978-92-0-103017-7 | STI/PUB/1786 | €38.00

Handbook on the Design of Physical Protection Systems for Nuclear Material and Nuclear Facilities

Technical Guidance

IAEA Nuclear Security Series No. 40-T

This publication provides comprehensive detailed guidance for States, competent authorities and operators, on how to implement the recommendations and implementing guidance of existing IAEA Nuclear Security Series publications for an effective physical protection system (PPS) for nuclear facilities and nuclear materials in use and storage. It provides further technical detail on how to design and evaluate a PPS with respect to the selection and integration of appropriate, effective physical protection measures (including equipment). The publication is intended to serve as a general reference, pointing users to other complementary guidance on specific topics.

English (Forthcoming) | ISBN 978-92-0-105419-7 | STI/PUB/1875 | €60.00

International Conference on Physical Protection of Nuclear Material and Nuclear Facilities

Summary of an International Conference Held in Vienna, 13–17 November 2017

Proceedings Series

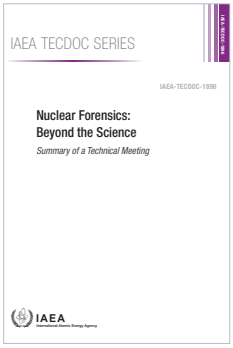
This publication is a summary of an international conference in the field of nuclear security. The conference was convened to foster the exchange of practices and experiences related to the security of radioactive material under regulatory control in use, transport and storage, and the detection of nuclear and other radioactive material out of regulatory control. The conference provided a forum for Member States to share their experiences, difficulties, and lessons learned during the implementation of IAEA Nuclear Security Series No. 13. The publication contains the President's summary and the statements from the opening and closing sessions. The attached CD-ROM contains the full conference programme and presentations from the conference.

English (36 pp.; 2018) | ISBN 978-92-0-106918-4 | STI/PUB/1831 | €40.00

Nuclear Forensics: Beyond the Science

Summary of a Technical Meeting

IAEA TECDOC Series No. 1896



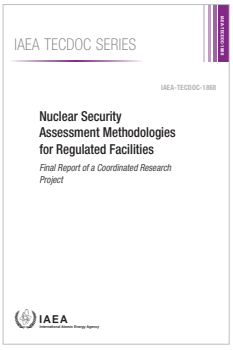
Since its establishment in the 1990s, nuclear forensics has developed from a nascent field focused on developing scientific methods, to a mature one with national strategies concerned with implementing nuclear forensics science to meet nuclear security responsibilities. Although significant progress has been made, challenges exist when developing comprehensive national programmes. To help address those challenges, the IAEA organized a technical meeting, which provided a forum for nuclear forensics experts and stakeholders from Member States to highlight the role of nuclear forensics in the context of nuclear security, share good practices, and to discuss the transition of nuclear forensics from science to practical implementation. This publication summarizes the outcomes and findings of the technical meeting but also reviews the broader themes with a focus on the consistent implementation of nuclear forensics globally.

English (62 pp; 2020) | ISBN 9978-92-0-100920-3 | IAEA-TECDOC-1896 | €18.00

Nuclear Security Assessment Methodologies for Regulated Facilities

Final Report of a Coordinated Research Project

IAEA TECDOC Series No. 1868



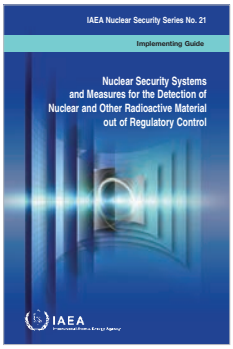
This publication presents the results of an IAEA coordinated research project entitled Development of Nuclear Security Assessment Methodologies (NUSAM) for Regulated Facilities. It includes a description of the completed NUSAM methodology as well as the results of applying that methodology to three case studies covering the following facilities/activities: a nuclear power plant, an irradiator facility and radioactive material transport.

English (144 pp., 40 figs; 2019) | ISBN 978-92-0-101719-2 | IAEA-TECDOC-1868 | €18.00

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

Implementing Guide

IAEA Nuclear Security Series No. 21



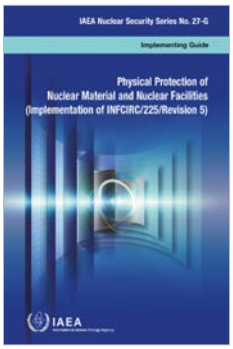
This publication provides guidance to Member States for the development, or improvement, of nuclear security systems and measures for the detection of criminal or unauthorized acts with nuclear security implications involving nuclear and other radioactive material out of regulatory control. It describes the elements of an effective nuclear security detection architecture which is composed 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 (66 pp., 3 figs; 2015) | ISBN 978-92-0-605515-1 | STI/PUB/1613 | €30.00
English (60 pp., 3 figs; 2013) | ISBN 978-92-0-142910-0 | STI/PUB/1613 | €30.00
French (70 pp., 3 figs; 2019) | ISBN 978-92-0-209918-0 | STI/PUB/1613 | €30.00

Physical Protection of Nuclear Material and Nuclear Facilities (Implementation of INFCIRC/225/Revision 5)

Implementing Guide

IAEA Nuclear Security Series No. 27-G



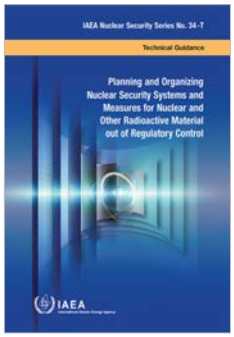
This publication is the lead Implementing Guide in a suite of guidance on implementing the Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), IAEA Nuclear Security Series No. 13. It provides guidance and suggestions to assist States and their competent authorities in establishing, strengthening and sustaining their national physical protection regime and implementing the associated systems and measures, including operators' physical protection systems.

Arabic (152 pp., 7 figs; 2018) | ISBN 978-92-0-606418-4 | STI/PUB/1760 | €46.00
English (120 pp., 7 figs; 2018) | ISBN 978-92-0-111516-4 | STI/PUB/1760 | €46.00
French (130 pp., 7 figs; 2019) | ISBN 978-92-0-206518-5 | STI/PUB/1760 | €46.00
Spanish (132 pp., 7 figs; 2019) | ISBN 978-92-0-307318-9 | STI/PUB/1760 | €46.00

Planning and Organizing Nuclear Security Systems and Measures for Nuclear and Other Radioactive Material out of Regulatory Control

Technical Guidance

IAEA Nuclear Security Series No. 34-T



This publication provides guidance on the planning and organization of nuclear security systems and measures for the detection of criminal or intentional unauthorized acts involving nuclear and other radioactive material out of regulatory control (the detection architecture, as described in IAEA Nuclear Security Series No. 21) and for the response to potential nuclear security events (the response framework). The guidance includes processes for reviewing the adequacy of existing nuclear security systems and measures, identifying gaps in capabilities and resources, and designing new systems and measures to address identified gaps.

English (58 pp., 7 figs; 2019) | ISBN 978-92-0-100119-1 | STI/PUB/1842 | €43.00

Preparation, Conduct and Evaluation of Exercises for Detection of and Response to Acts Involving Nuclear and Other Radioactive Material out of Regulatory Control

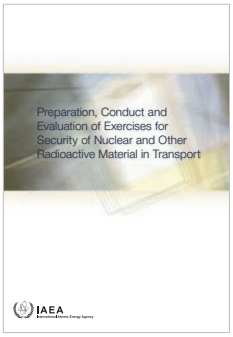
Technical Guidance

IAEA Nuclear Security Series No. 41-T

This publication presents detailed concepts and procedures for the preparation, conduct and evaluation of exercises to test relevant nuclear security systems and measures and provides useful templates and checklists that can be used to assist the exercise development process. The technical guidance provided is targeted at States and their competent authorities to assist them in establishing and sustaining an effective infrastructure to strengthen detection of and response to material out of regulatory control and evaluate the effectiveness of their plans by presenting a structured methodology for the consistent development of exercises.

English (Forthcoming) | ISBN 978-92-0-105619-1 | STI/PUB/1877 | €52.00

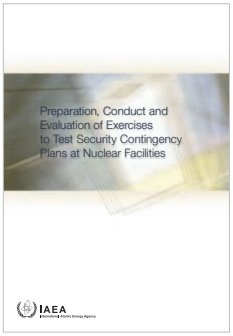
Preparation, Conduct and Evaluation of Exercises for Security of Nuclear and Other Radioactive Material in Transport



This publication provides practical information for planners on preparing, conducting and evaluating nuclear material transport security exercises. Nuclear material transport security exercises are part of a comprehensive nuclear security regime. Exercises vary in scope and in scale, ranging from small drills, which focus on training, to large scale exercises, which aim at testing the overall command, control, coordination and communications arrangements. The purpose of exercises is not to 'demonstrate' the quality of the arrangements, but rather, to identify weaknesses and areas where improvements can be made. Hence, exercises are an integral part of a sustainable and continuous improvement programme for nuclear transport security. Exercises can also be a tool to assess and validate existing transport security arrangements prior to gaining regulatory approval for actual transport operations or transport campaigns. The material provided in this publication is intended as an example of a logical process for the preparation, undertaking and evaluation of exercises, which needs to be adapted to suit national systems, local circumstances and the specific aim of each exercise. It constitutes a starting point for organizations that have not previously organized or managed exercise programmes, as well as a reference for organizations that wish to validate or improve their existing exercise programmes.

English (120 pp., 2 figs; 2018) | ISBN 978-92-0-107018-0 | IAEA-TDL-007 | €18.00

Preparation, Conduct and Evaluation of Exercises to Test Security Contingency Plans at Nuclear Facilities



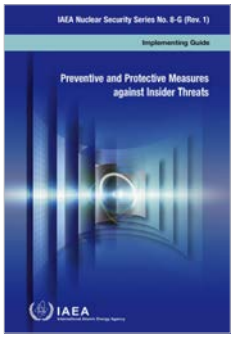
This publication provides a single source of advice on developing and maintaining an effective and comprehensive nuclear security exercise programme pertaining to all aspects of testing contingency plans at nuclear facilities. It focuses on the methods for preparing, conducting and evaluating partial and large-scale exercises. The methods may also be applicable for simpler exercises, although not all parts of the process in such cases may be needed.

English (90 pp., 4 figs; 2018) | ISBN 978-92-0-107418-8 | IAEA-TDL-008 | €18.00

Preventive and Protective Measures against Insider Threats

Implementing Guide

IAEA Nuclear Security Series No. 8-G (Rev. 1)



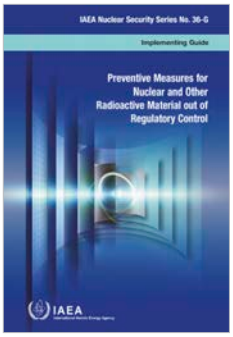
This publication is a revision of IAEA Nuclear Security Series No. 8, Preventive and Protective Measures against Insider Threats, published in 2008. The new publication provides updated guidance to States, their competent authorities and operators, shippers and carriers on selecting, implementing, and evaluating measures for addressing insider threats. It applies to any type of nuclear facility, notably nuclear power plants, research reactors, and other nuclear fuel cycle facilities (e.g. enrichment plants, reprocessing plants, fuel fabrication plants, storage facilities), whether in design, redesign, construction, commissioning, operation, shutdown or decommissioning.

English (37 pp., 1 fig.; 2020) | ISBN 978-92-0-103419-9 | STI/PUB/1858 | €24.00

Preventive Measures for Nuclear and Other Radioactive Material out of Regulatory Control

Implementing Guide

IAEA Nuclear Security Series No. 36-G



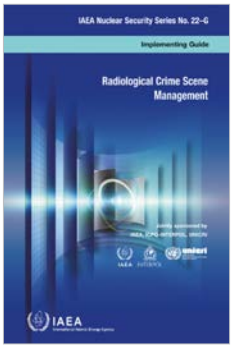
This publication elaborates upon the recommendations given in IAEA Nuclear Security Series No. 15, Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control, in relation to preventative measures. It serves as guidance for Member States interested in strengthening their nuclear security regime as it relates to nuclear and other radioactive material out of regulatory control and in improving their capabilities. The publication covers the following indicative elements: general considerations for preventive measures; deterrence measures; including deterrence by punishment and deterrence by denial, information security; promotion of nuclear security culture; and measures for addressing the insider threat, including measures to promote the trustworthiness of personnel. The last section of the publication provides guidance on international cooperation and assistance to strengthen preventive measures.

English (28 pp.; 2019) | ISBN 978-92-0-102619-4 | STI/PUB/1855 | €38.00

Radiological Crime Scene Management

Implementing Guide

IAEA Nuclear Security Series No. 22-G



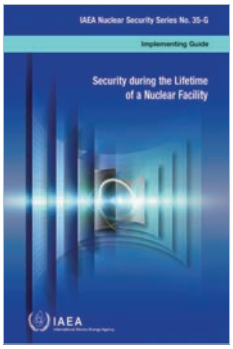
Radiological crime scene management is the process used to ensure safe, secure, effective and efficient operations at a crime scene where nuclear or other radioactive materials are known, or suspected, to be present. Managing a radiological crime scene is a key part of responding to a nuclear security event. Evidence collection at radiological crime scenes may share a wide range of characteristics with that at conventional crime scenes, such as evidence search patterns, geographical scene modelling and evidence recording, whether or not explosives are involved. This publication focuses on the framework and functional elements for managing a radiological crime scene that are distinct from any other crime scene. It assumes that States have a capability for managing conventional crime scenes.

Arabic (93 pp., 25 figs; 2017) | ISBN 978-92-0-604217-5 | STI/PUB/1672 | €48.00
English (93 pp., 25 figs; 2014) | ISBN 978-92-0-108714-0 | STI/PUB/1672 | €48.00
Spanish (107 pp., 25 figs; 2019) | ISBN 978-92-0-306917-5 | STI/PUB/1672 | €48.00

Security during the Lifetime of a Nuclear Facility

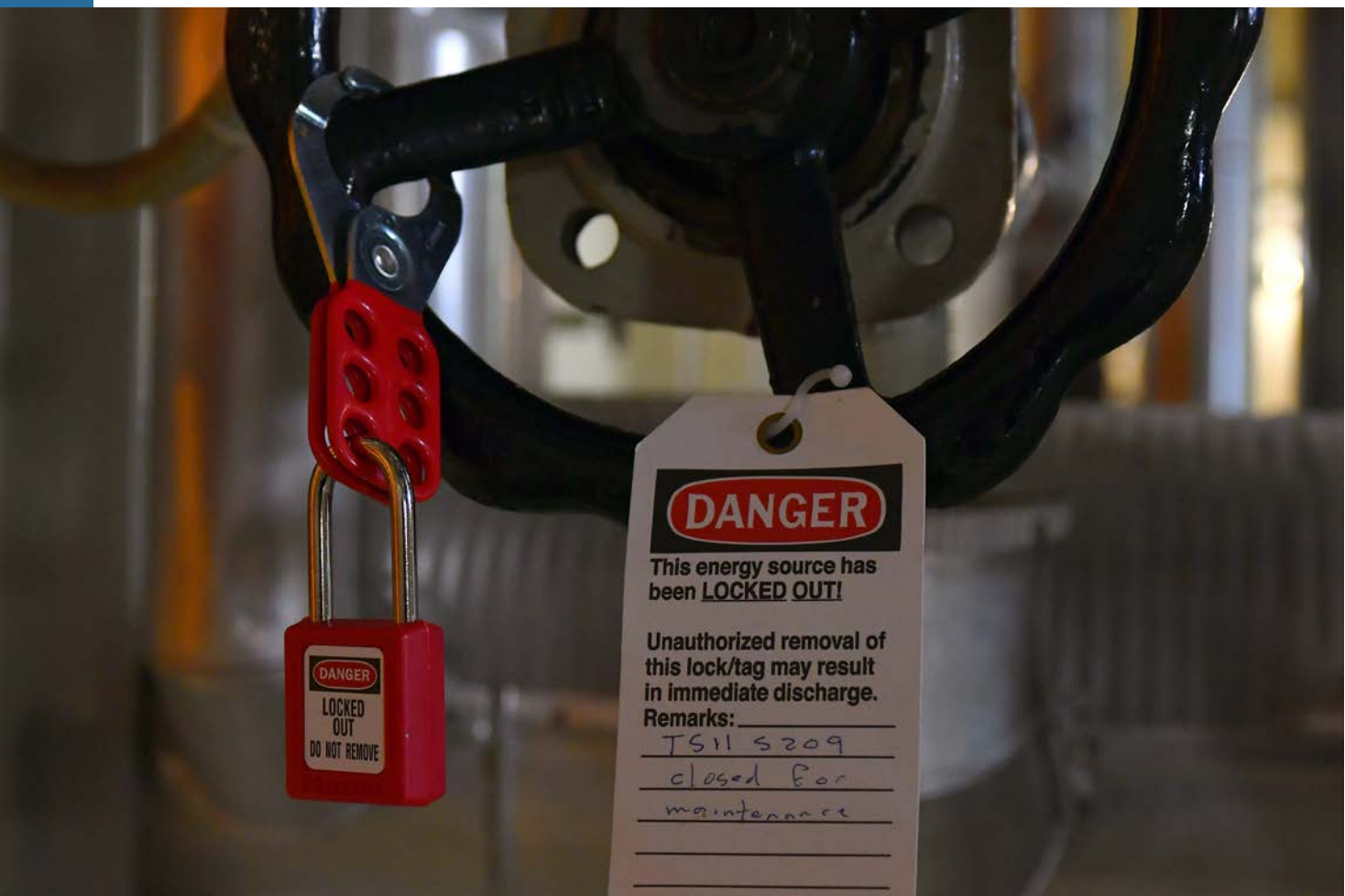
Implementing Guide

IAEA Nuclear Security Series No. 35-G



This publication provides guidance to States, competent authorities and operators on appropriate nuclear security measures during each stage in the lifetime of a nuclear facility, from initial planning of the facility through to its final decommissioning. The publication addresses effective nuclear security in the transition between stages and applies to the nuclear security of nuclear material and nuclear facilities throughout the lifetime of all types of nuclear facility. Although focused on nuclear power, the guidance contained in this publication may be useful for States developing nuclear programmes with other types of facility, including those for research and development.

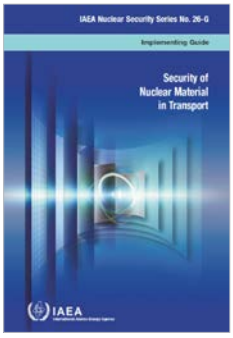
English (29 pp.; 2019) | ISBN 978-92-0-101119-0 | STI/PUB/1849 | €24.00



Security of Nuclear Material in Transport

Implementing Guide

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 IAEA Nuclear Security Series No. 13, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), and provides additional guidance on how to implement these recommendations in practice.

Arabic (110 pp., 2 figs; 2018) | ISBN 978-92-0-604117-8 | STI/PUB/1686 | €48.00
English (104 pp., 2 figs; 2015) | ISBN 978-92-0-102015-4 | STI/PUB/1686 | €48.00
French (114 pp., 2 figs; 2019) | ISBN 978-92-0-206218-4 | STI/PUB/1686 | €48.00

Security of Radioactive Material in Transport

Implementing Guide

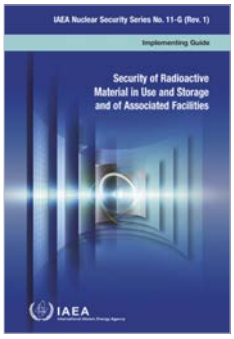
IAEA Nuclear Security Series No. 9-G (Rev. 1)

This updated version of IAEA Nuclear Security Series No. 9, Security of Radioactive Material in Transport, is intended to facilitate the establishment of an internationally consistent approach to security of radioactive material in transport. It builds on the relevant recommendations of various existing IAEA Nuclear Security Series publications and is applicable to the security of packages containing radioactive material that could cause unacceptable radiological consequences if used in a malicious act during international or domestic transport. It is also relevant to the security of some nuclear materials of category III and below during transport, due to the radioactive nature of the material. Guidance on protection against unauthorized removal and sabotage is also covered.

English (Forthcoming) | ISBN 978-92-0-105119-6 | STI/PUB/1872 | €42.00

Security of Radioactive Material in Use and Storage and of Associated Facilities

IAEA Nuclear Security Series No. 11-G (Rev.1)



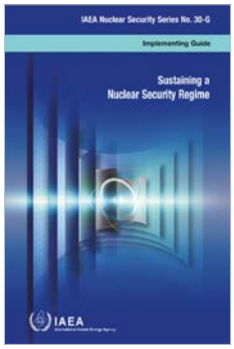
This revision of IAEA Nuclear Security Series No. 11-G, provides guidance to States and their competent authorities on how to establish or improve, implement, maintain and sustain the elements of the nuclear security regime related to radioactive material, associated facilities and activities, with particular emphasis on the development of regulatory requirements. The publication applies to the security of radioactive material in use or in storage as well as associated facilities and associated activities and assists Member States in their regimes against unauthorized removal of the radioactive material or sabotage performed with the intent to cause harmful radiological consequences.

English (105 pp., 2 figs.; 2019) | ISBN 978-92-0-110018-4 | STI/PUB/1840 | €50.00

Sustaining a Nuclear Security Regime

Implementing Guide

IAEA Nuclear Security Series No. 30-G



This publication addresses the sustainability of all aspects of a national nuclear security regime, including those relating to nuclear material and nuclear facilities, other radioactive material and associated facilities, and nuclear and other radioactive material out of regulatory control. The publication is relevant for States that have established a nuclear security regime as well as for States that are in the process of establishing one. It includes guidance on how to address challenges in sustaining a nuclear security regime over time. It also addresses the initial development and implementation of the regime, particularly where sustainability can be built into it as part of its design.

English (26 pp.; 2018) | ISBN 978-92-0-111816-5 | STI/PUB/1763 | €25.00

The Gate to Africa Exercise Programme: Morocco–Spain Joint Tabletop and Field Exercises on Maritime Security of Radioactive Material in Transport

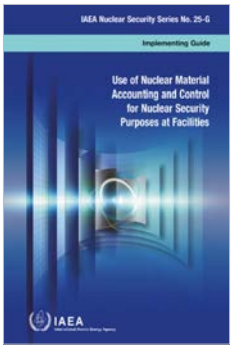
In May 2012, Morocco, Spain and the IAEA jointly organized a technical seminar on the risk of nuclear terrorism. This led to the adoption of a Joint Action Plan that provided an adequate framework for conducting exercises for nuclear security events and radiological emergencies. The Gate to Africa exercise programme on transport security is an implementation of the Joint Action Plan. This publication summarizes the Gate to Africa exercise programme and describes the scenarios utilized. It also lists the lessons learned and findings from the exercise. As such, this publication is intended to assist other Member States interested in implementing their own transport security exercises.

English (Forthcoming) | ISBN 978-92-0-106519-3 | STI/PUB/1886 | €35.00

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

Implementing Guide

IAEA Nuclear Security Series No. 25-G



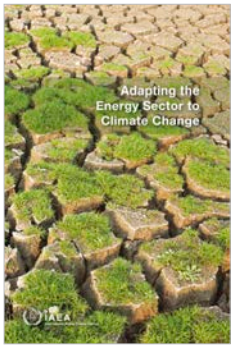
Nuclear material accounting and control (NMAC) measures are designed to protect nuclear facilities and nuclear material from adversaries such as non-State actors both inside and outside the nuclear facility. This publication focuses on measures to prevent and mitigate the risk posed by insider threats. It describes elements of a programme that can be implemented at a nuclear facility in coordination with other systems existing at the facility level, such as operations, measurements and physical protection, for the purpose of deterring and detecting unauthorized removal of nuclear material.

Arabic (65 pp.; 2018) | ISBN 978-92-0-609017-6 | STI/PUB/1685 | €30.00
English (63 pp.; 2015) | ISBN 978-92-0-101915-8 | STI/PUB/1685 | €30.00
French (71 pp.; 2018) | ISBN 978-92-0-206318-1 | STI/PUB/1685 | €30.00
Spanish (75pp;2019) | ISBN 978-92-0-306818-5 | STI/PUB/1685 | €30.00

Nuclear Power Planning and
Economics,
Nuclear Power Operations,
Reactor Technology,
Quality Assurance,
Qualification and Training
of Personnel

NUCLEAR POWER

Adapting the Energy Sector to Climate Change

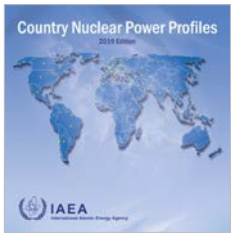


This publication presents a systematic overview of the diverse range of impacts on the energy sector resulting from gradual climate change and related shifts in extreme weather events. All the elements of the supply chain in the energy sector are discussed: resource base, extraction and transport of depletable energy sources, power generation, transmission and distribution. Three national assessments (Argentina, Pakistan and Slovenia) of energy sector vulnerability and adaptation options are also described.

English (131 pp., 28 figs; 2019) | ISBN 978-92-0-100919-7 | STI/PUB/1847 | €40.00

Country Nuclear Power Profiles

2019 Edition

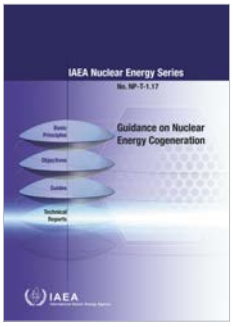


The Country Nuclear Power Profiles (CNPP) publication compiles background information on the status and development of nuclear power programmes across participating International Atomic Energy Agency (IAEA) Member States. The publication summarizes organizational and industrial aspects of nuclear power programmes and provides information about the relevant legislative, regulatory and international framework in each participating State. The descriptive and statistical overview of the 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 2019 edition contains updated country information for 26 out of 38 participating Member States.

English (2019) | ISBN 978-92-0-159519-5 | IAEA-CNPP/2019/CD | €95.00

Guidance on Nuclear Energy Cogeneration

IAEA Nuclear Energy Series No. NP-T-1.17



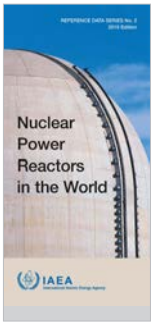
Cogeneration, i.e. the production of electricity and heat, has proven to be a highly efficient and environmentally attractive option for energy conversion. Nuclear cogeneration could be considered as an option in the light of actions on climate change. However, nuclear cogeneration is not widely deployed. This publication provides a quick introduction to the advantages, experience, and future planning for implementation of nuclear cogeneration. It also highlights some demonstration projects that were developed in the past in connection with industries, describing technical concepts for combined nuclear–industrial complexes. The publication is intended to be of interest to users in academia and industry as well as government agencies and public institutions requiring basic information on various aspects of using nuclear power for cogeneration.

English (52 pp., 17 figs; 2019) | ISBN 978-92-0-104119-7 | STI/PUB/1862 | €32.00

Nuclear Power Reactors in the World

2019 Edition

Reference Data Series No. 2



This is the 39th 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 2018 on power reactors operating, under construction and shut down as well as performance data on reactors operating in 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).

English (80 pp., 6 figs; 2019) | ISBN 978-92-0-102719-1 | IAEA-RDS-2/39 | €18.00

Strategic Environmental Assessment for Nuclear Power Programmes: Guidelines

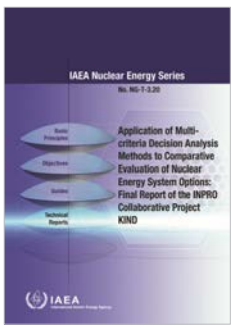
IAEA Nuclear Energy Series No. NG-T-3.17

This publication provides practical information on performing strategic environmental assessments (SEAs) for nuclear power programmes. It incorporates the latest knowledge and draws on best practices in conducting SEAs. Based on inputs from SEA experts from across the world, it lays down an effective SEA process that contributes to strengthening decision making for nuclear power programmes; achieving environmentally sound and sustainable development; and improving good governance and building public trust and confidence in decision making. Importantly, SEA for nuclear power programmes can ensure effective communication with the public and other stakeholders. Consequently, significant emphasis is placed on stakeholder engagement and public participation. Further, appropriate tools for assessment and quality review are presented for all stages of the SEA process.

English (74 pp., 17 figs; 2018) | ISBN 978-92-0-104418-1 | STI/PUB/1815 | €36.00

Application of Multi-criteria Decision Analysis Methods to Comparative Evaluation of Nuclear Energy System Options: Final Report of the INPRO Collaboration Project KIND

IAEA Nuclear Energy Series No. NG-T-3.20

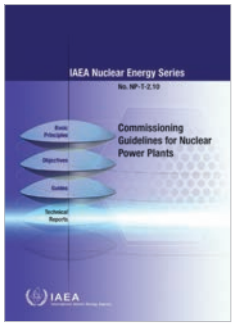


This publication presents the results of a collaborative project on key indicators for innovative nuclear energy systems. It describes the approach and several case studies performed by Member States to evaluate, on a comparative basis, both nuclear energy system and nuclear energy evolution scenario options with evolutionary and innovative nuclear energy technologies and examines the applicability of this approach for different kinds of problems in the nuclear and non-nuclear energy planning fields.

English (229 pp., 162 figs; 2019) | ISBN 978-92-0-102319-3 | STI/PUB/1853 | €58.00

Commissioning Guidelines for Nuclear Power Plants

IAEA Nuclear Energy Series No. NP-T-2.10



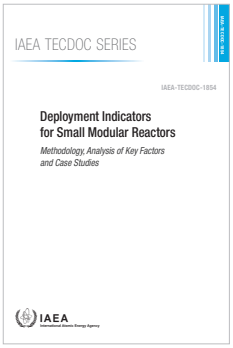
Commissioning is one of the key steps towards putting into service a new nuclear facility, or a new system, structure or component within an existing facility. Commissioning activities need to be planned early in the design and procurement process, with careful consideration of eventual acceptance criteria and test methods. This publication describes commissioning in its basic form, the commissioning process specific to nuclear power plants, the relevant management system requirements, typical organizational models and critical human resources issues. It also provides details on experience and lessons learned obtained in Member States. The publication will be of use to all stakeholders involved in the commissioning of nuclear power plants, including owner/operators, contractors, engineers, regulatory bodies and vendors.

English (133 pp., 31 figs; 2018) | ISBN 978-92-0-102816-7 | STI/PUB/1742 | €48.00

Deployment Indicators for Small Modular Reactors

Methodology, Analysis of Key Factors and Case Studies

IAEA TECDOC Series No. 1854

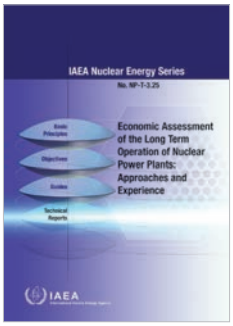


This publication provides IAEA Member States with a methodology to evaluate the potential for deployment of small modular reactors (SMRs) in a national energy portfolio. It elaborates the specific attributes of SMRs and evaluates their deployment potential from the viewpoints of energy demand, finance and economics, infrastructure, climate change and energy security in an energy portfolio. Case studies are used to illustrate the types of conditions that are potentially favourable for SMRs and Member States can further adapt the process to country-specific needs..

English (58 pp.; 2018) | ISBN 978-92-0-105718-1 | IAEA-TECDOC-1854 | €18.00

Economic Assessment of the Long Term Operation of Nuclear Power Plants: Approaches and Experience

IAEA Nuclear Energy Series No. NP-T-3.25



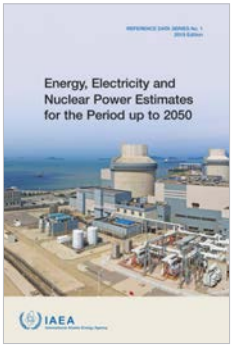
This publication describes the various approaches to the techno-economic assessment of a project for the long term operation of a nuclear power plant in its specific market environment. It examines the process of defining the technical scope required to prolong the operating licences of nuclear power plants and highlights the need for further studies on technical cost drivers and economic assessments in order to better define the cost boundaries of long term operation. Information is also provided on the new IAEA software LTOFIN, which was developed to assist in performing long term operation economic assessments within the process described in the publication.

English (126 pp., 27 figs; 2018) | ISBN 978-92-0-104218-7 | STI/PUB/1813 | €47.00

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

2019 Edition

Reference Data Series No. 1

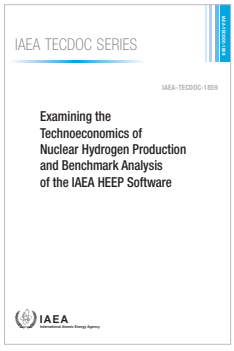


The 39th edition of the annual Reference Data Series No. 1 contains estimates of energy, electricity and nuclear power trends up to the year 2050, using a variety of sources, such as the IAEA's Power Reactor Information System and data prepared by the United Nations.

English (139 pp., 62 figs; 2019) | ISBN 978-92-0-109319-6 | IAEA-RDS-1/39 | €20.00

Examining the Technoeconomics of Nuclear Hydrogen Production and Benchmark Analysis of the IAEA HEEP Software

IAEA TECDOC Series No. 1859

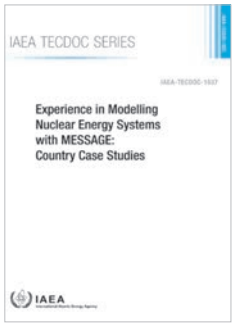


This publication documents the results achieved by participants of an IAEA coordinated research project (CRP) related to hydrogen production using nuclear energy. The IAEA, which previously developed the Hydrogen Economic Evaluation Programme (HEEP) supports the analysis of various options for future hydrogen economies. HEEP is the first of its kind software and has been distributed freely to IAEA Member States. The CRP participants performed a generic benchmark analysis for various scenarios of hydrogen production and against other codes built on different platforms and models. The research report highlights various aspects of nuclear hydrogen production based not only on national but also international trends. It considers important technical aspects of coupling nuclear reactors to hydrogen plants and the challenges for nuclear hydrogen production compared with steam or solar energy produced hydrogen. Major accomplishments achieved by Member States are presented in the summary section of this report. A detailed description of the activities and outcomes through the implementation of the CRP can be found in the individual country reports available on the CD-ROM attached to this publication.

English (226 pp., 96 figs; 2018) | ISBN 978-92-0-109318-9 | IAEA-TECDOC-1859 | €18.00

Experience in Modelling Nuclear Energy Systems with MESSAGE: Country Case Studies

IAEA TECDOC Series No. 1837



Member States have recognized the increasing need to model future nuclear power scenarios in order to develop strategies for sustainable nuclear energy systems. The IAEA Model for Energy Supply Strategy Alternatives and their General Environmental (MESSAGE) impacts code is a tool that supports energy analysis and planning in Member States. This publication documents the experience gained on modelling and scenario analysis of nuclear energy systems using the MESSAGE code through various case studies performed by the participating Member States on evaluation of and planning for nuclear energy sustainability at the regional or national level. The publication also elaborates on experience gained in modelling of global nuclear energy systems with a focus on specific aspects of collaboration among technology holder and technology user countries and the introduction of innovative nuclear technologies. It presents country case studies covering a variety of nuclear energy systems based on a once-through fuel cycle and a closed fuel cycle for thermal reactors, fast reactors and advanced systems. The feedback from case studies proves the analytical capabilities of the MESSAGE model and highlights the path forward for further advancements in the MESSAGE code and nuclear energy system modelling.

English (280 pp., 238 figs; 2018) | ISBN 978-92-0-109417-9 | IAEA-TECDOC-1837 | €18.00

Initiating Nuclear Power Programmes: Responsibilities and Capabilities of Owners and Operators

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

The development of the infrastructure for a nuclear power programme includes the establishment of policies and strategies in areas such as human resource development, nuclear fuel cycle and waste management, industrial involvement and nuclear safety. It also requires the establishment of a legal and regulatory framework that creates an environment enabling the project to be implemented in a transparent and effective manner. These elements of this infrastructure will have an impact on the project and will guide the discussions of the future owner/operator with potential vendors. In this regard, it is important that the owner/operator, if already identified, participates in this process from the beginning. This publication provides information on the establishment and development of the owner/operator so that it can discharge its responsibilities throughout the phases of the programme. It also discusses the management of the interfaces between the owner/operator and other stakeholders.

English (31 pp., 8 figs; 2020) | ISBN 978-92-0-104619-2 | STI/PUB/1867 | €30.00

Management of Nuclear Power Plant Projects

IAEA Nuclear Energy Series No. NG-T-1.6

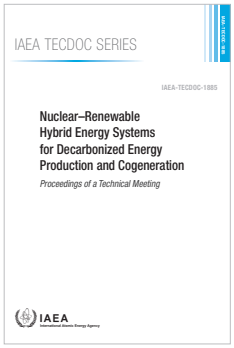
Member States intending to introduce a nuclear power programme will need to pass through several phases during the implementation. Experience shows that careful planning of the objectives, roles, responsibilities, interfaces and tasks to be carried out in different phases of a nuclear project is important for success. This publication presents a harmonized approach that may be used to structure the owner/operator management system and establish and manage nuclear projects and their development activities irrespective of the adopted approach. It has been developed from shared management practices and consolidated experiences provided by nuclear project management specialists through a series of workshops and working groups organized by the IAEA. The resultant publication presents a useful framework for the management of nuclear projects from initiation to closeout and captures international best practices.

English (Forthcoming) | ISBN 978-92-0-104719-9 | STI/PUB/1868 | €55.00

Nuclear–Renewable Hybrid Energy Systems for Decarbonized Energy Production and Cogeneration

Proceedings of a Technical Meeting

IAEA TECDOC Series No.1885

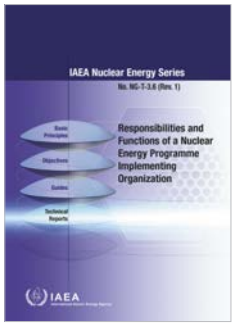


With more than 170 parties having ratified the Paris Agreement under the United Nations Framework Convention on Climate Change, viable, financially sound and integrated solutions for providing low carbon, affordable, energy is of critical interest. This, by necessity, encompasses the development of resilient production processes for the generation of electricity, heat, chemicals and fuels for deep decarbonization. Two principal options for low carbon energy are renewables and nuclear energy. While many institutions have expressed interest in one or the other of these options, few have explored the possible synergies between them. This publication consists of the proceedings of an IAEA Technical Meeting held to review and discuss concepts and innovative solutions, including the advantages and challenges associated with each option, pertaining to nuclear–renewable hybrid energy systems for decarbonized energy production and cogeneration.

English (228 pp., 144 figs; 2019) | ISBN 978-92-0-161419-3 | IAEA-TECDOC-1885 | €18.00

Responsibilities and Functions of a Nuclear Energy Programme Implementing Organization

IAEA Nuclear Energy Series No. NG-T-3.6 (Rev. 1)



An important element of the Milestones Approach to introducing nuclear power is a mechanism to coordinate efforts among the many organizations and individuals who have roles to play in the process. This mechanism is referred to as a nuclear energy programme implementing organization (NEPIO). This publication describes a set of responsibilities, functions and activities that States can use as guidance for establishing a NEPIO and ensuring its effectiveness. This revision incorporates lessons learned from Integrated Nuclear Infrastructure Review missions and IAEA technical assistance activities. It attempts to clarify that there are many ways to structure a NEPIO and that each could result in the successful execution of all functions and activities. Several case studies are included. Consistent with the revision of IAEA Nuclear Energy Series No. NG-G-3.1 (Rev. 1) Milestones in the Development of a National Infrastructure for Nuclear Power published in 2015, this publication recognizes that the NEPIO plays an important and evolving role in each of the three phases of nuclear power infrastructure development.

English (44 pp., 17 figs; 2019) | ISBN 978-92-0-100619-6 | STI/PUB/1845 | €36.00

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

Specific Safety Guide

IAEA Safety Standards Series No. SSG-48

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

English (65 pp., 8 figs; 2018) | ISBN 978-92-0-104318-4 | STI/PUB/1814 | €43.00

Application of Wireless Technologies in Nuclear Power Plant Instrumentation and Control Systems

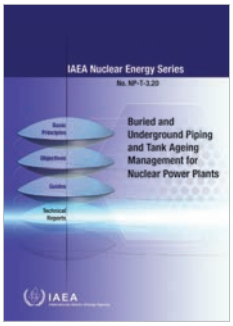
IAEA Nuclear Energy Series No. NR-T-3.29

This publication summarizes the results of an IAEA coordinated research project on the application of wireless technologies in the nuclear industry. It provides an overview of the current knowledge, existing practices, operating experiences and benefits and challenges related to the use of the technology in instrumentation and control systems of nuclear facilities. The research areas covered were codes, standards and regulatory guides; wireless technologies for nuclear applications; practices, experience, lessons learned; potential wireless applications, and emerging technologies and challenges. The main part of the publication contains information derived from the results achieved in each research area. The annexes include supporting information and selected details of the research work that was performed. The information provided in this publication supports Member States' capabilities in the design, development, implementation, operation and, as necessary, licensing of wireless technologies in the nuclear industry.

English (Forthcoming) | ISBN 978-92-0-104819-6 | STI/PUB/1869 | €46.00

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.

English (377 pp., 227 figs; 2018) | ISBN 978-92-0-102116-8 | STI/PUB/1735 | €60.00

Challenges and Approaches for Selecting, Assessing and Qualifying Commercial Industrial Digital Instrumentation and Control Equipment for Use in Nuclear Power Plant Applications

IAEA Nuclear Energy Series No. NR-T-3.31

The focus of this publication is on the activities required to demonstrate the suitability of commercial off the shelf (COTS) digital instrumentation and control equipment for use in nuclear safety applications. The publication provides a detailed discussion of the typical challenges associated with the use of COTS devices, including issues associated with unique vulnerabilities and features of digital products. It outlines the strategy for digital COTS device assessment and qualification and describes the typical elements of the process. The publication addresses the specific steps of any justification, including identifying the requirements, selection of the supplier and candidate equipment, planning, assessment and identification of equipment life issues, suitability evaluation and all associated documentation. Maintaining the compliance of COTS devices as well as related regulatory aspects are also covered.

English (81 pp.; 7 figs; 2020) | ISBN 978-92-0-105019-9 | STI/PUB/1871 | €38.00

Computer Security Aspects of Design for Instrumentation and Control Systems at Nuclear Power Plants

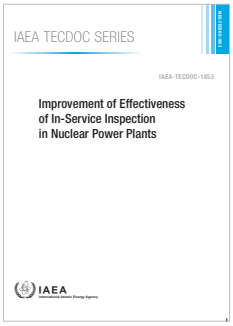
IAEA Nuclear Energy Series No. NR-T-3.30

The transition to digital technology has changed the nature of instrumentation and control (I&C) systems by enabling extensive interconnection of reprogrammable, functionally interdependent I&C systems. This development has made computer security a necessary element for consideration in I&C system design. The benefits and challenges of the various computer security methods and controls with their implementation in nuclear power plant I&C systems are discussed and described in this publication. The publication provides an overview of current knowledge, up to date good practices, experience, and benefits and challenges related to the application of computer security measures. It defines the key concepts for computer security for I&C systems at nuclear facilities, explains the risk informed approach to computer security and describes how computer security measures are applied throughout the I&C system life cycle. Situations where I&C systems are interconnected with enterprise management systems are also addressed. The three appendices present case studies with practical application examples.

English (Forthcoming) | ISBN 978-92-0-104919-3 | STI/PUB/1870 | €35.00

Improvement of Effectiveness of In-Service Inspection in Nuclear Power Plants

IAEA TECDOC Series No. 1853

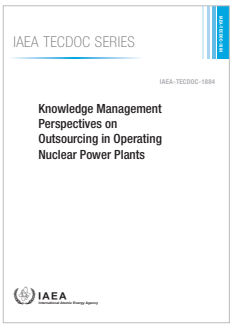


This publication outlines the main aspects and issues to be considered when developing and improving in-service inspection effectiveness in nuclear power plants (NPPs). It also provides a status of in-service inspection practices in NPPs in selected IAEA Member States, evaluating criteria for effective traditional in-service inspection and introducing the concept of risk-informed in-service inspection. The strategies for improving in-service effectiveness discussed in this publication consider the entire framework of in-service inspection, including effective selection of the proper inspection scope, inspection interval and non-destructive examination efficiency.

English (98 pp., 18 figs; 2018) | ISBN 978-92-0-106618-3 | IAEA-TECDOC-1853 | €18.00

Knowledge Management Perspectives on Outsourcing in Operating Nuclear Power Plants

IAEA TECDOC Series No.1884

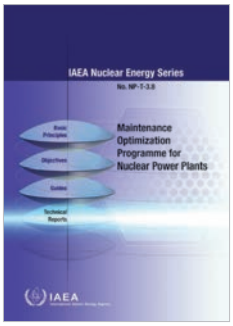


This publication is intended to assist the management teams of operating organizations and nuclear power plants (NPPs) that outsource certain activities or use external services, in identifying and implementing an appropriate knowledge management strategy. A proactive approach to acquiring new organizational knowledge and the competence needed for operating NPPs is described. The methodologies provided are applicable to outsourcing for all phases of the nuclear power plant life cycle including preparation, design, construction, operation, long term operation and decommissioning. While this publication applies primarily to NPPs and focuses on operating plant processes, it also may be relevant for other nuclear organizations, such as research facilities, technical support organizations, academic facilities, and nuclear fuel cycle facilities.

English (106 pp., 6 figs; 2019) | ISBN 978-92-0-161219-9 | IAEA-TECDOC-1884 | €18.00

Maintenance Optimization Programme for Nuclear Power Plants

IAEA Nuclear Energy Series No. NP-T-3.8



This publication deals with the latest nuclear power plant maintenance optimization programmes and provides key requirements and strategies for their successful implementation. It documents shared proven maintenance optimization methods and techniques from Member States, including the more detailed examples in the annexes of this publication.

English (48 pp., 8 figs; 2018) | ISBN 978-92-0-110916-3 | STI/PUB/1757 | €39.00

Mapping Organizational Competencies in Nuclear Organizations

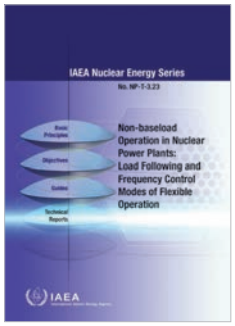
IAEA Nuclear Energy Series No. NG-T-6.14

This publication outlines the concepts and models supporting the requirements for understanding organizational competence within the nuclear context. It aims to help in the development of organizational competencies in countries with an existing nuclear power capability and those wishing to embark on a nuclear power programme. The publication summarizes necessary processes for mapping organizational competencies, as well as tools and techniques used for assessing them. Specific information provided in this publication will help organizations to determine competence needs based on strategic/corporate objectives and business processes and to identify their existing success factors.

English (Forthcoming) | ISBN 978-92-0-100519-9 | STI/PUB/1844 | €32.00

Non-baseload Operation in Nuclear Power Plants: Load Following and Frequency Control Modes of Flexible Operation

IAEA Nuclear Energy Series No. NP-T-3.23



This publication aims to address all relevant aspects of flexible (non-baseload) operation of nuclear power plants specifically focusing on changing electrical output to match the electrical demand and to control the frequency of the electrical system. It provides collective guidance based on current knowledge and operational experience, for the decision making, preparation and implementation of flexible operation for Member States who are considering future flexible operations of their nuclear power plants.

English (173 pp., 62 figs; 2018) | ISBN 978-92-0-110816-6 | STI/PUB/1756 | €40.00

Nuclear Power Plant Operating Experience

from the IAEA/NEA International Reporting System for Operating Experience 2012–2014

The International Reporting System for Operating Experience (IRS) is an essential element of the international operating experience feedback system for nuclear power plants. Its fundamental objective is to contribute to improving safety of commercial nuclear power plants which are operated worldwide. IRS reports contain information on events of safety significance with important lessons learned which assist in reducing recurrence of events at other plants. This sixth publication, covering the period 2012–2014, follows the structure of the previous editions. It highlights important lessons based on a review of the approximately 240 event reports received from the participating countries over this period.

English (53 pp., 9 figs; 2018) | ISBN 978-92-0-102417-6 | STI/PUB/1780 | €28.00

Operating Experience with Nuclear Power Stations in Member States

2019 Edition

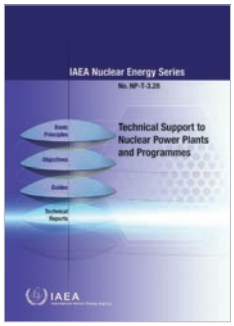
Operating Experience

This CD-ROM contains the 50th 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). The dashboards of individual operational reactor units contain information on their overall performance during 2018. 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.

English (CD Edition; 2019) | ISBN 978-92-0-158419-9 | STI/PUB/1896 | €75.00

Technical Support to Nuclear Power Plants and Programmes

IAEA Nuclear Energy Series No. NP-T-3.28



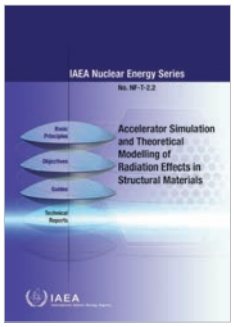
This publication addresses relevant aspects of requesting and obtaining effective technical support and its adequate utilization in decision making on nuclear power programmes, projects and plants. It describes the technical support functions and associated organizational activities and skills in providing technical and scientific input to the decisions on plant safety and performance throughout the plant's life cycle and provides information on establishing and sustaining technical support capability and capacity in Member States embarking on nuclear power programmes or already operating nuclear power plants. The publication also presents observations, lessons learned and conclusions drawn from good practices for defining and maintaining roles, responsibilities and interfacing requirements of technical support organizations, nuclear power project/plant entities and other stakeholders. As such, it provides a set of descriptive and practised processes that integrate technical and scientific information for safety, performance and economic aspects in support of sound and timely decisions on the safe, reliable and efficient operation of nuclear power plants.

English (130 pp.; 20 figs; 2018) | ISBN 978-92-0-103018-4 | STI/PUB/1824 | €42.00

REACTOR TECHNOLOGY

Accelerator Simulation and Theoretical Modelling of Radiation Effects in Structural Materials

IAEA Nuclear Energy Series No. NF-T-2.2

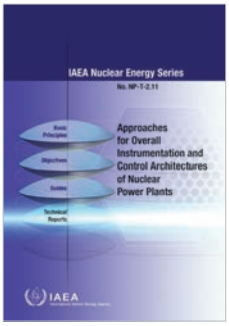


This publication summarizes the findings and conclusions of the IAEA coordinated research project (CRP) on accelerator simulation and theoretical modelling of radiation effects, aimed at supporting Member States in the development of advanced radiation resistant structural materials for implementation in innovative nuclear systems. This aim can be achieved through enhancement of 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 were 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, multiscale modelling tools, and advanced examination techniques.

English (116 pp.; 2018) | ISBN 978-92-0-107415-7 | STI/PUB/1732 | €39.00

Approaches for Overall Instrumentation and Control Architectures of Nuclear Power Plants

IAEA Nuclear Energy Series No. NP-T-2.11



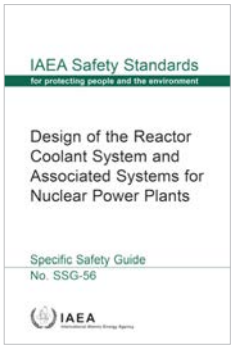
This publication concerns approaches for establishing the overall instrumentation and control (I&C) architecture of a nuclear power plant. It describes the characteristics and content of general I&C architectures, presents architectural principles and addresses the limitation of the potential effects of postulated common cause failures. It introduces an architectural development process and discusses technical considerations for the design. The publication emphasizes safety aspects and addresses the defence in depth concept, but also includes consideration of plant availability, operability and security. It recognizes the potential for adverse effects of I&C failures on plant availability and operability that may arise from increased architectural complexity, and describes the optimization of I&C functionality and features that need to be implemented.

English (55 pp., 9 figs; 2018) | ISBN 978-92-0-102718-4 | STI/PUB/1821 | €30.00

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

Specific Safety Guide

IAEA Safety Standards Series No. SSG-56

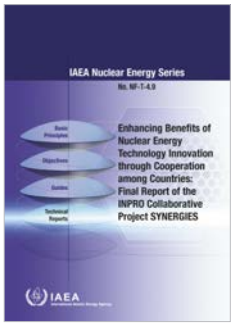


This Safety Guide provides recommendations on how to meet the requirements established in IAEA Safety Standards Series No. SSR-2/1(Rev. 1) in relation to the reactor coolant system and associated systems for nuclear power plants. It is a revision of IAEA Safety Standards Series No. NS-G-1.9 which it supersedes. The publication takes into account developments, experience and practices in the design of nuclear power plants throughout their lifetime. It references and considers other IAEA safety standards that are relevant and related to the design of the reactor coolant system and associated systems for nuclear power plants. Recommendations to achieve the required reliability of the capabilities designed to transfer residual heat to the ultimate heat sink in the different plant states are also included. As those systems are dependent on specific reactor technologies, more appropriate recommendations have been developed respectively for pressurized light water reactors, boiling water reactors and pressurized heavy water reactors.

English (99 pp., 2 figs; 2020) | ISBN 978-92-0-105719-8 | STI/PUB/1878 | €48.00

Enhancing Benefits of Nuclear Energy Technology Innovation through Cooperation among Countries: Final Report of the INPRO Collaborative Project SYNERGIES

IAEA Nuclear Energy Series No. NF-T-4.9

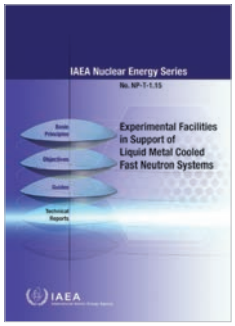


This publication provides a summary of the INPRO collaborative project on synergistic nuclear energy regional group interactions evaluated for sustainability. Benefits of nuclear technology innovation can be amplified through cooperation among countries in the nuclear fuel cycle. Nuclear energy sustainability can be enhanced, not only for technology holders but also for a variety of technology users, including those who do not pursue innovations in their home countries. If one partner in a synergistic collaboration is achieving enhanced sustainability, then the other partner(s) may achieve similar enhancement through collaboration without the requisite large national investments in technology, R&D and related infrastructure development. The publication presents 28 case studies conducted by Member States to identify and evaluate mutually beneficial patterns of cooperation in the nuclear fuel cycle and the driving forces and impediments involved in such cooperation.

English (341 pp., 227 figs; 2018) | ISBN 978-92-0-101118-3 | STI/PUB/1807 | €66.00

Experimental Facilities in Support of Liquid Metal Cooled Fast Neutron Systems

IAEA Nuclear Energy Series No. NP-T-1.15

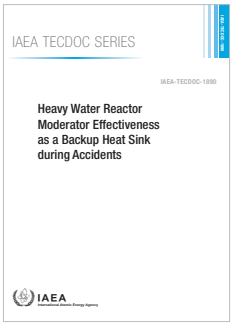


This publication presents both an overview and detailed information on more than 150 experimental facilities being used for developing and deploying innovative liquid metal cooled (sodium, lead and lead–bismuth) fast neutron systems, both critical and subcritical. Facilities, both under construction and those in operation are considered. It is expected that by providing the end users with detailed information on existing and future experimental facilities able to support innovative liquid metal cooled fast neutron systems, the publication will facilitate cooperation between organizations and knowledge transfer. An overview of the existing and future experimental facilities is presented in the body text of this publication. The profiles of all facilities in the form of individual papers are available on the attached CD-ROM and in the related on-line database maintained by the IAEA Catalogue of Facilities in Support of Liquid Metal Cooled Fast Neutron Systems (LMFNS Catalogue).

English (52 pp; 2018) | ISBN 978-92-0-101018-6 | STI/PUB/1806 | €30.00

Heavy Water Reactor Moderator Effectiveness as a Backup Heat Sink during Accidents

IAEA TECDOC Series No.1890

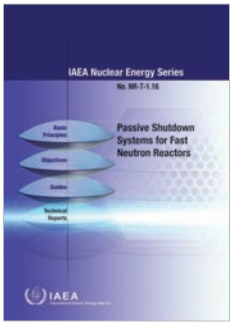


The IAEA organizes international collaborative standard problems (ICSPs) to facilitate the development and validation of computer codes for design and safety analysis of nuclear power plants, which usually includes an experimental investigation of important phenomena and simulation of the experiment with computer codes. This ICSP investigated phenomena that determine the thermomechanical behaviour of heavy water reactor fuel channels during a fuel overheating scenario. The publication summarizes the experiment, the complex and transient nature of phenomena interactions that ultimately determine fuel channel behaviour, the simulation methods and results, and the lessons learned from the ICSP. It provides a comparison of the results obtained from eight participating organizations from five countries, utilizing different methods and computer codes. General conclusions drawn and recommendations made for future developments are also included.

English (96 pp., 56 figs; 2019) | ISBN 978-92-0-162919-7 | IAEA-TECDOC-1890 | €18.00

Passive Shutdown Systems for Fast Neutron Reactors

IAEA Nuclear Energy Series No. NR-T-1.16



Designs for nuclear power plants increasingly include passive features. A major focus of the design of modern fast reactors is on inherent and passive safety. Inherent and passive safety features are especially important when active systems such as emergency shutdown systems for reactor shutdown are not functioning properly. This publication discusses the past experience in the development of such systems along with the research that is ongoing. It provides information on the basic design principles for passive shutdown systems and the related operational experience gathered so far, and reviews the innovative concepts under development as well as the needs for research and development and qualification tests.

English (110 pp., 93 figs.; 2020) | ISBN 978-92-0-104219-4 | STI/PUB/1863 | €38.00

Status of Research and Technology Development for Supercritical Water Cooled Reactors

IAEA TECDOC Series No. 1869

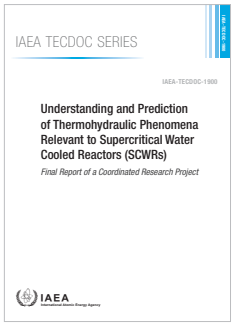
There is considerable interest in both developing and developed countries in the design of innovative water cooled reactors (WCRs) and, owing to the higher thermal efficiency and significant system simplifications, supercritical water cooled reactors (SWCRs). Compared with conventional WCRs, the SCWR concept requires extensive research and development. Fundamental research in understanding important phenomena has been completed successfully, providing information required for the next step of development. Currently, a few concepts have been assessed as being technically feasible, and several other concepts are under development. These concepts are described in this publication, together with detailed analysis of remaining gaps requiring future research and development.

English (74 pp., 14 figs; 2019) | ISBN 978-92-0-101919-6 | IAEA-TECDOC-1869 | €18.00

Understanding and Prediction of Thermohydraulic Phenomena Relevant to Supercritical Water Cooled Reactors (SCWRs)

Final Report of a Coordinated Research Project

IAEA TECDOC Series No. 1900

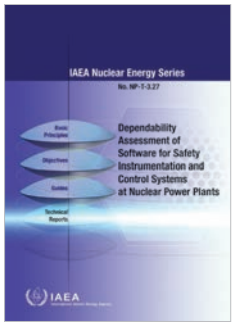


This publication is the outcome of an IAEA coordinated research project (CRP) on understanding and prediction of thermohydraulic phenomena relevant to supercritical water cooled reactors (SCWRs). The publication illustrates the state of the art of SCWR research and development. It is a key supporting publication for researchers and engineers pursuing the development of SCWRs or equipment/components operating at supercritical pressures. Scientific investigators from participating institutes identified specific research objectives to improve the predictive capability of key technology areas (such as heat transfer and pressure drop for SCWR fuel related geometries, parallel channel stability boundary, natural circulation flow, critical heat flux at near critical pressures, critical flow, and subchannel and plenum mixing). The publication presents the background and objectives and descriptions of the revised Canadian SCWR design concept and a new SCWR design concept being developed at the Nuclear Power Institute of China. It also presents updated information on key areas of technology, such as supercritical heat transfer in simple geometries, stability and critical flow, which have been obtained since the completion of the previous CRP. New experiments and data on supercritical heat transfer in bundles and on critical heat flux, and the application of direct numerical simulation approach for supercritical heat transfer are also detailed.

English (544 pp., 386 figs.; 2020) | ISBN 978-92-0-102320-9 | IAEA-TECDOC-1900 | €18.00

Dependability Assessment of Software for Safety Instrumentation and Control Systems at Nuclear Power Plants

IAEA Nuclear Energy Series No. NP-T-3.27

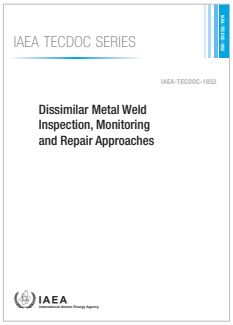


This publication defines a framework that represents the state of the art of assessment methodologies for safety and instrumentation and control software used at nuclear power plants. It describes an approach for developing and communicating assessments based on claims, arguments and evidence. The assessment of software dependability, which encompasses properties such as safety, reliability, availability, maintainability and security, is an essential and challenging aspect of the safety justification. Information is given on guiding principles to provide the basis for defining an assessment strategy and implementing the assessment process. Sources of evidence for the assessment are provided and lessons learned from past digital instrumentation and control system implementation in areas such as software development, operational usage, regulatory review and platform certification are also described.

English (80 pp., 10 figs; 2018) | ISBN 978-92-0-101218-0 | STI/PUB/1808 | €38.00

Dissimilar Metal Weld Inspection, Monitoring and Repair Approaches

IAEA TECDOC Series No. 1852

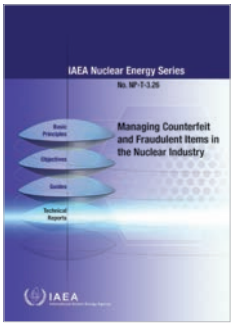


This publication outlines the main aspects and issues to be considered when developing and improving dissimilar metal weld inspections in nuclear power plants. It presents good practices and lessons learned and provides guidance to inspection organizations and their managers and operating staff, and to the local suppliers who provide inspection services for utilities, as well as some practical case studies. The publication discusses requirements for an in-service inspection programme, different inspection techniques and methods, inspection qualification and evaluation of its results and challenges for ultrasonic inspection of dissimilar metal welds. The inspection programme and its requirements are based on the safety classification or safety significance of the component. An important aspect of this publication is the discussion of dissimilar metal welds repairing and replacement techniques and how to mitigate or remove cracks and corrosion that might have an impact on the safety margins.

English (122 pp., 43 figs; 2018) | ISBN 978-92-0-105618-4 | IAEA-TECDOC-1852 | €18.00

Managing Counterfeit and Fraudulent Items in the Nuclear Industry

IAEA Nuclear Energy Series No. NP-T-3.26



This publication is designed to assist Member State organizations in preventing, detecting and addressing counterfeit and fraudulent items on an ongoing basis. It provides users with recognized good practices for the introduction of a programme to effectively manage counterfeit and fraudulent items in the nuclear industry.

English (94 pp., 25 figs; 2019) | ISBN 978-92-0-102318-6 | STI/PUB/1817 | €39.00

A Framework for Sustainable Nuclear Education: Education Capability Assessment and Planning

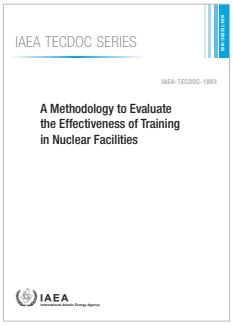
IAEA Nuclear Energy Series No. NG-T-6.5

This publication provides a framework for maximizing the potential of the education systems in developing countries to contribute to the promotion and development of nuclear science and technology. Establishing nuclear science and technology, and the requisite educational system, in developing countries is a delicate balance. Factors such as social acceptance, resource mobilization, human capital, job opportunities, recruitment sustainability and nuclear contributions to socioeconomic development need to be carefully considered to enable the maximum benefits to be derived. Progress towards this aim can be achieved within the framework of the Education Capability Assessment and Planning (ECAP) methodology, which provides tools for developing countries to establish a sustainable national nuclear education system with coordinated strategy, policy and planning. Countries that apply this methodology can benefit from a more systematic and integrated strategic approach to developing, enhancing and improving their national nuclear education systems. These improvements come through strengthened interaction and coordination between government, educators and industry.

English (Forthcoming) | ISBN 978-92-0-101318-7 | STI/PUB/1809 | €35.00

A Methodology to Evaluate the Effectiveness of Training in Nuclear Facilities

IAEA TECDOC Series No.1893

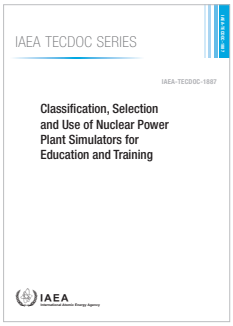


This publication presents a set of training standards and conditions, based on the internationally accepted systematic approach to training methodology, which can be used by any nuclear facility to objectively evaluate the quality of its training, learning and development infrastructure, processes and programmes. It provides information on options for peer review processes, including IAEA assistance, and on creating independent validation bodies, although the main focus is the self-assessment methodology as this is key to self-awareness and improvement. The use of the systematic approach to training offers significant advantages over more conventional, curricula-driven training in terms of consistency, efficiency and management control, leading to greater reliability of training results and enhanced safety and efficiency of the plant.

English (54 pp; 2019) | ISBN 978-92-0-163519-8 | IAEA-TECDOC-1893 | €18.00

Classification, Selection and Use of Nuclear Power Plant Simulators for Education and Training

IAEA TECDOC Series No.1887



As nuclear power is one of the options that can be used to meet the growing energy demands of countries around the world, educating and enriching people with adequate knowledge on nuclear energy, nuclear reactor technologies, nuclear systems, reactor components and the embedded nuclear safety features are of paramount importance. Experience shows that education and training nuclear power plant simulators are effective tools that allow for a broad range of target groups to meet education and training objectives. This publication provides information based on the lessons learned from IAEA training courses on reactor technologies with the use of various NPP simulators. The main topics are classification of various types of NPP simulators for education and training, suitable selection of simulators according to assessment of education and training needs, and integration of simulators into educational and training programmes to enhance knowledge based skills.

English (44 pp., 2 figs; 2019) | ISBN 978-92-0-162219-8 | IAEA-TECDOC-1887 | €18.00

Developing a Systematic Education and Training Approach Using Personal Computer Based Simulators for Nuclear Power Programmes

Proceedings of a Technical Meeting Held in Vienna, 15–19 May 2017

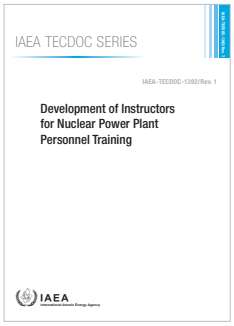
IAEA TECDOC Series No. 1836

This publication compiles the output and findings of a technical meeting organized by the IAEA. The use of personal computer based basic principle simulators in education and training is aimed at enhancing understanding of nuclear technologies through 'learning by doing'. This hands-on experiential training is highly suitable for operators, maintenance technicians, suppliers, regulators, students and engineers. Experts from 21 Member States, together with IAEA staff, presented the current status of the personal computer based basic principle simulators and their applications in education and training, and identified relevant gaps and needs for improvements and/or new development. The resultant publication includes summaries of the presentations, follow-up discussions as well as conclusions and recommendations for possible future activities.

English (164 pp., 52 figs; 2018) | ISBN 978-92-0-109217-5 | IAEA-TECDOC-1836 | €18.00

Development of Instructors for Nuclear Power Plant Personnel Training

IAEA TECDOC Series No. 1392/Rev. 1



The present revised publication reflects new training experiences, technological developments, current practices and techniques concerning the development of instructors for nuclear power plant personnel training. It provides practical information on various aspects of instructor selection, development and deployment, by quoting actual examples from Member States. The publication highlights the importance of having an appropriate training policy, especially considering the various organizational arrangements that exist in different nuclear power plants and countries.

English (142 pp., 3 figs; 2018) | ISBN 978-92-0-108018-9 | IAEA-TECDOC-1392/Rev. 1 | €18.00

Exploring Semantic Technologies and their Application to Nuclear Knowledge Management

IAEA Nuclear Energy Series No. NG-T-6.15

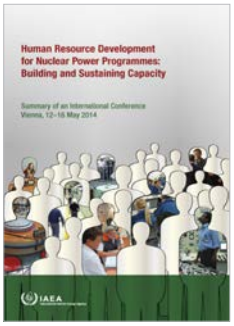
Within the nuclear field, a vast body of knowledge, involving scientific, technical and managerial fields, is distributed among many organizations of different types. Managing and provisioning distributed knowledge is therefore becoming one of the major challenges in federated organizational environments. This publication provides information to organizations dealing with nuclear knowledge and its management. It covers an introduction to semantic information technologies, the Worldwide Web standards developed for interoperability, the construction of knowledge bases on the basis of distributed knowledge, and the development of knowledge driven applications. In addition to providing insight into the development of distributed knowledge bases, the intent of this publication is to provide examples of applications of semantic technologies specifically in the nuclear field.

English (Forthcoming) | ISBN 978-92-0-108719-5 | STI/PUB/1899 | €36.00

Human Resource Development for Nuclear Power Programmes: Building and Sustaining Capacity

Proceedings of an International Conference 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. The main topics addressed include 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.

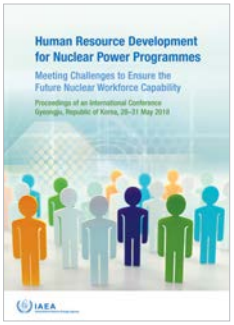
English (44 pp.; 2018) | ISBN 978-92-0-102516-6 | STI/PUB/1739 | €50.00

Human Resource Development for Nuclear Power Programmes

Meeting Challenges to Ensure the Future Nuclear Workforce Capability

Proceedings of an International Conference Held in Gyeongiu, Republic of Korea, 28–31 May 2018

Proceedings Series



These proceedings highlight the key findings and recommendations of the conference, which provided a forum for information exchange on national and international policies and practices. Conference participants had a broad range of expertise across the areas of capacity building, human resource development, education and training, knowledge management and knowledge networks for nuclear power programmes. With a focus on future challenges, the participants reviewed the current state of human resource development in the nuclear field (including nuclear education and training) and provided practical solutions that can be used at organizational, national and international levels to develop and maintain the human resources needed to support the safe and sustainable operation of nuclear power programmes. The main ideas and messages expressed and discussed at the conference are presented in the opening addresses, the session summaries and the President's summary. The attached CD-ROM contains interactive presentations, plenary presentations and the conference programme.

English (44 pp; 2019) | ISBN 978-92-0-108619-8 | STI/PUB/1898 | €35.00

International Nuclear Management Academy Master's Programmes in Nuclear Technology Management

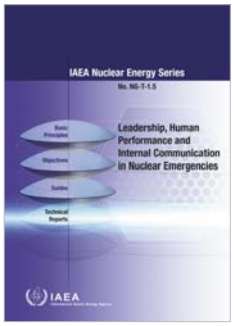
IAEA Nuclear Energy Series No. NG-T-6.12

The IAEA facilitated International Nuclear Management Academy (INMA) supports universities to establish and deliver master's degree programmes focusing on technology management for the nuclear sector including nuclear power programmes, nuclear applications and radiological technologies. The publication provides information for master's programmes that have a specialized focus on the advanced aspects of management and leadership required by the nuclear sector. It describes the requirements for an INMA nuclear technology management programme (NTM) as well as recommendations for their implementation. The process for a university's NTM programme to be endorsed by the IAEA, including peer review missions, is described in detail with templates for the required information package included. The publication is applicable to universities, stakeholders of nuclear educational programmes and any other nuclear or radiological organization wishing to support the education of their managers and leaders.

English (94 pp., 4 figs; 2020) | ISBN 978-92-0-107217-7 | STI/PUB/1795 | €38.00

Leadership, Human Performance and Internal Communication in Nuclear Emergencies

IAEA Nuclear Energy Series No. NG-T-1.5



This publication focuses on the challenges and their possible solutions in the areas of leadership, human performance and internal communication in a severe nuclear emergency. It presents a brief overview of some of the key concepts, especially how they relate to an organization's ability to successfully manage an emergency event. The target audience for this publication are those officials and senior managers dealing with emergency response in the operating organization, government, local authorities and the regulatory body. Those who have an influence on the style of leadership and personnel development and training that is applied in their organizations and who are involved in emergency preparedness and response will also benefit from this publication.

English (36 pp., 2 figs; 2018) | ISBN 978-92-0-103317-8 | STI/PUB/1789 | €30.00

Mapping Organizational Competencies in Nuclear Organizations

IAEA Nuclear Energy Series No. NG-T-6.14

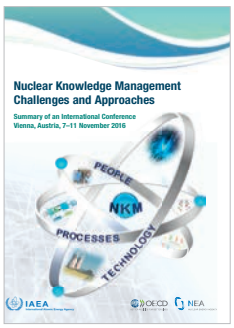
This publication outlines the concepts and models supporting the requirements for understanding organizational competence within the nuclear context. It aims to help in the development of organizational competencies in both countries, with an existing nuclear power capability and those wishing to embark on a nuclear power programme. The publication summarizes necessary processes for mapping organizational competencies, as well as tools and techniques used for assessing them. Specific information provided in this publication will help organizations to determine competence needs based on strategic/corporate objectives and business processes and to identify their existing success factors.

English (Forthcoming) | ISBN 978-92-0-100519-9 | STI/PUB/1844 | €32.00

Nuclear Knowledge Management Challenges and Approaches

Summary of an International Conference Held in Vienna, Austria, 7–11 November 2016

Proceedings Series

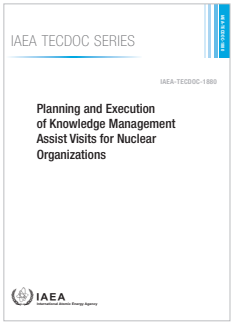


These proceedings present the outcome of the third international conference on nuclear knowledge management organized by the International Atomic Energy Agency. The scope of the conference encompassed eight thematic areas, exploring both cross-cutting aspects of nuclear knowledge management and its specific applications for different types and phases of nuclear facilities and technologies. Through the presentation and discussion of issues and solutions related to building, collecting, transferring, sharing, maintaining, preserving and utilizing knowledge, the conference aimed to improve awareness of the importance of knowledge management in the nuclear sector. Various issues in relation to human resource development, competencies, methodological or process knowledge and technology related knowledge were also discussed in detail. The proceedings highlight the key findings and recommendations of the event, the opening statement as well as the conclusions of the conference president. The papers presented and discussed during the conference are available on the attached CD-ROM.

English (56 pp.; 2018) | ISBN 978-92-0-108818-5 | STI/PUB/1838 | €37.00

Planning and Execution of Knowledge Management Assist Visits for Nuclear Organizations

IAEA TECDOC Series No.1880

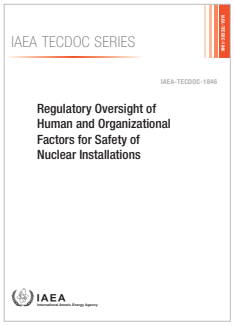


This publication provides a basic structure and common reference for knowledge management assist visits (KMAVs). As such, it is written primarily for the team members of KMAVs and the counterpart requesting a visit. However, the publication also provides a valuable reference for other IAEA peer review services. The publication presents guidelines across the various activities inherent in KMAVs. Specifically, KMAVs facilitate the transfer of pragmatic knowledge management methodologies and tools, assist Member States considering implementation of nuclear power programmes to integrate knowledge management into their management system, provide specific consultancy services to address emergent problems and long term issues related to knowledge management assist organizations in formulating detailed requirements and action plans related to knowledge management, and help organizations identify their own knowledge management maturity levels against a set of predefined criteria through a self-assessment exercise.

English (64 pp., 5 figs; 2019) |
ISBN 978-92-0-110319-2 |
IAEA-TECDOC-1880 | €18.00

Regulatory Oversight of Human and Organizational Factors for Safety of Nuclear Installations

IAEA TECDOC Series No. 1846



Written for use by regulatory bodies and their technical support organizations, and those individuals supporting human performance activities and programmes, this publication addresses the definition and implementation of an oversight programme that adequately takes into account human and organizational factors to oversee safety throughout the lifetime of nuclear installations. A key concept is that safety is the result of interaction between humans, technology and the organization. Based on the outcome of several international meetings, this publication presents the main elements to be used to enhance regulatory oversight capabilities and describes the essential concepts and terms used in the area of human and organizational factors. It is intended to help in the development of regulations and guides related to these factors, stressing the key role of the licensee's management system in establishing and maintaining conditions to support people at work. The TECDOC describes ways to verify compliance with regulatory requirements related to human and organizational factors, as well as ways to better understand associated trends and conclusions, using an integrated safety assessment approach.

English (66 pp., 3 figs; 2018) | ISBN 978-92-0-103318-5 | IAEA-TECDOC-1846 | €18.00

Uranium Ore Processing,
Fuel Fabrication and Performance,
Spent Fuel Management,
Waste Management

NUCLEAR FUEL CYCLE AND WASTE MANAGEMENT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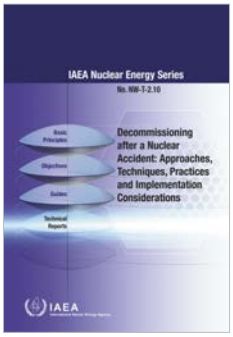
Decommissioning after a Nuclear Accident: Approaches, Techniques, Practices and Implementation Considerations

IAEA Nuclear Energy Series No. NW-T-2.10



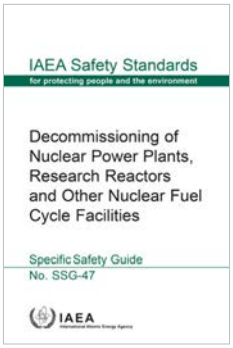
This publication describes differences in post-accident situations compared with normal decommissioning (i.e. decommissioning after a planned final shutdown) and identifies significant decision factors as applicable. It focuses on the on-site decommissioning aspects of a technical nature, that need to be addressed after a nuclear accident. Non-technical issues, such as policy and strategy, project planning, organization and management are also covered. The collection of experience on approaches, techniques, practices and implementation considerations is based on practical examples and lessons learned from past events, including the Fukushima Daiichi accident. Although the publication addresses decommissioning of nuclear power reactors after an accident, many aspects and considerations are also relevant for non-power nuclear facilities as well as legacy nuclear facilities.

English (122 pp., 63 figs; 2019) | ISBN 978-92-0-104018-3 | STI/PUB/1811 | €39.00

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

Specific Safety Guide

IAEA Safety Standards Series No. SSG-47



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

English (99 pp., 1 fig.; 2018) | ISBN 978-92-0-104118-0 | STI/PUB/1812 | €40.00

Decommissioning of Particle Accelerators

IAEA Nuclear Energy Series No. NW-T-2.9

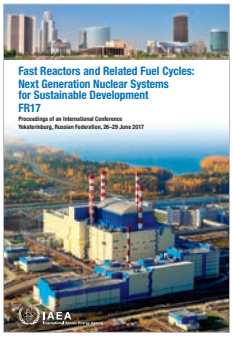
This publication presents information on experience and lessons learned from implementation of decommissioning projects for particle accelerators. Based on this information, and highlighting typical issues and concerns, the publication provides practical information for all those having a role in this process. The publication is written for operators of accelerator facilities, particularly those approaching the decommissioning stage, or maintaining a facility in a deferred dismantling state, as well as for regulators, waste managers, decision makers at government level, local authorities, decommissioning contractors and designers of accelerators. It is anticipated that the lessons learned and described in this publication will contribute to decommissioning planning during the design stage of new facilities, hence minimizing the generation of radioactive waste without compromising structural characteristics and the effectiveness of the construction.

English (Forthcoming) | ISBN 978-92-0-102419-0 | STI/PUB/1854 | €46.00

Fast Reactors and Related Fuel Cycles: Next Generation Nuclear Systems for Sustainable Development (FR17)

Proceedings of an International Conference Held in Yekaterinburg, Russian Federation, 26–29 June 2017

Proceedings Series

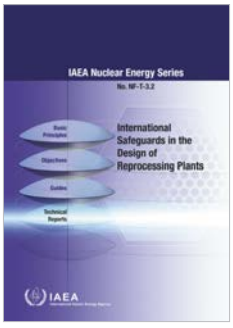


This publication presents the proceedings of an IAEA international conference in the field of fast reactors and related fuel cycle technologies. The conference provided a unique forum to discuss national and international fast reactor programmes, to analyse new experience and development advances arising from research and development programmes, and to identify needs to be addressed in relation to the industrial deployment of fast reactors. The conference also included two panel events devoted to safety design criteria for sodium cooled fast reactors and small and medium-sized fast reactors. An event dedicated to young professionals involved in fast reactor programmes and projects was organized as a plenary session. About 200 oral technical presentations and 200 posters complemented the overall picture of the scientific and the state of the art technical developments worldwide. The proceedings comprise a summary of the different technical, plenary and young generation event sessions as well as the opening, closing and plenary speeches delivered during the conference. A CD-ROM with contributed papers (which are also available online) accompanies the publication.

English (260 pp., 49 figs; 2018) | ISBN 978-92-0-108618-1 | STI/PUB/1836 | €43.00

International Safeguards in the Design of Reprocessing Plants

IAEA Nuclear Energy Series No. NF-T-3.2

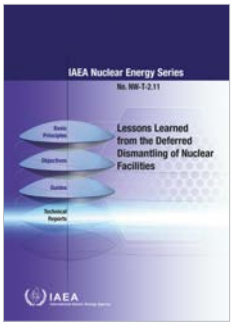


This publication is part of a series that aims to inform nuclear facility designers, vendors, operators and State governments, about IAEA safeguards and how associated requirements can be considered early in the design phase of a new nuclear facility. This particular publication is applicable to the design of spent nuclear fuel reprocessing plants. Safeguards by design dialogue undertaken early in the design and construction of reprocessing plants, facilitates the implementation of safeguards throughout all the life cycle stages of the facility. The potential to reduce costs, avoid retrofits and achieve efficiencies both for the operator and for IAEA Member States, are important drivers for the early consideration of safeguards in a nuclear facility design project.

English (62 pp., 15 figs; 2019) | ISBN 978-92-0-104519-5 | STI/PUB/1866 | €34.00

Lessons Learned from the Deferred Dismantling of Nuclear Facilities

IAEA Nuclear Energy Series No. NW-T-2.11

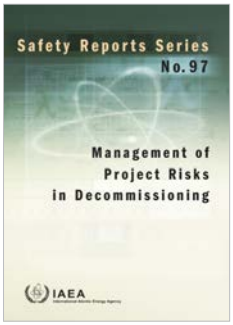


The publication discusses the issues that need to be dealt with when preparing a facility for safe enclosure, or safely maintaining it for a long time. It provides details of lessons learned from deferred decommissioning of nuclear facilities following planned shutdown. These lessons have been learned from a variety of facilities, with a variety of hazards, configurations and decommissioning programmes. While some of the considerations addressed may apply to facilities involved in an operating incident or accident, they are not specifically addressed by this publication, as the individual nature of their hazards and decommissioning challenges precludes their use as examples. The publication addresses the preparation for, and the steady state part of the safe enclosure phase; it should be understood that in a later part of that phase the on- and off-site requirements and arrangements will change as plans and infrastructure are prepared for the next phase, which is the final dismantling, remediation and site release.

English (116 pp., 41 figs; 2018) | ISBN 978-92-0-100418-5 | STI/PUB/1803 | €44.00

Management of Project Risks in Decommissioning

Safety Reports Series No. 97



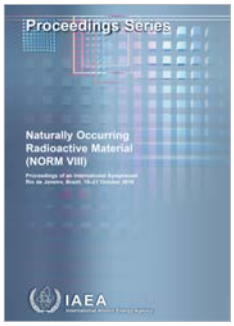
This Safety Report provides specific guidance on the management of project risks in decommissioning. The publication proposes a systematic and proactive approach to identifying, analysing, evaluating, and treating relevant project risks at strategic and operational levels, and provides examples of application of the proposed approach..

English (57 pp., 6 figs; 2019) | ISBN 978-92-0-108918-2 | STI/PUB/1839 | €35.00

Naturally Occurring Radioactive Material (NORM VIII)

Proceedings of an International Symposium Held in Rio de Janeiro, Brazil, 18–21 October 2016

Proceedings Series

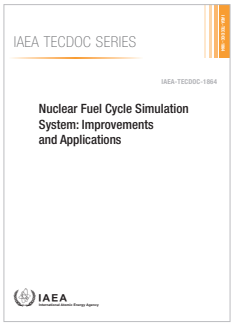


These proceedings present the outcome of the eighth symposium on naturally occurring radioactive material (NORM). The symposium provided an important opportunity to review recent technical and regulatory developments concerning exposure to NORM, with the overall objectives of addressing radiation protection issues, discussing the results of new research, exploring practical case studies of industrial applications, and identifying new societal needs and technical requirements for regulatory bodies and industries involving NORM. The symposium provided a platform for experts from industries, academic and research institutions, and regulatory bodies from all over the world to share experiences, identify opportunities, analyse current challenges, and review progress made in identifying, quantifying and managing the radiological risks associated with industrial processes involving NORM. Ongoing activities to implement new international standards during the period since the last NORM symposium in 2013 provided an important backdrop to the presentations and discussion. The proceedings contain 31 papers that were accepted for oral presentation, text versions of 35 poster presentations and a summary that concludes with the main findings of the symposium.

English (422 pp.; 2018) | ISBN 978-92-0-107618-2 | STI/PUB/1832 | €50.00

Nuclear Fuel Cycle Simulation System: Improvements and Applications

IAEA TECDOC Series No. 1864

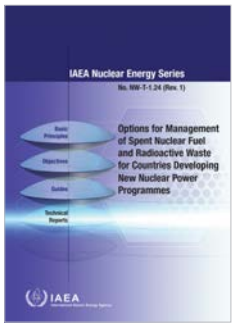


The Nuclear Fuel Cycle Simulation System (NFCSS) is a scenario based computer simulation tool that can model various nuclear fuel cycle options in various types of nuclear reactor. It is efficient and accurate in identifying, for example, the nuclear mineral resources and technical infrastructure needed for the front end of the nuclear fuel cycle; the amounts of used fuel, actinide nuclides and high level waste generated for a given reactor fleet size; and the impact of introducing recycling of used fuel on mineral resource savings and waste minimization. Since the first publication on the NFCSS as IAEA-TECDOC-1535 in 2007, there have been significant improvements in the implementation of the NFCSS, including a new extension to thorium fuel cycles, methods to calculate decay heat and radiotoxicity, and demonstration applications to innovative reactors.

English (212 pp., 141 figs; 2019) | ISBN 978-92-0-101219-7 | IAEA-TECDOC-1864 | €18.00

Options for Management of Spent Fuel and Radioactive Waste for Countries Developing New Nuclear Power Programmes

IAEA Nuclear Energy Series No. NW-T-1.24 (Rev. 1)

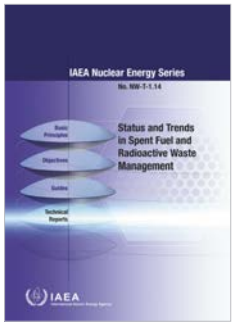


Many countries are considering the construction of their first nuclear power plant or the expansion of a small nuclear power programme, and some have limited experience in managing radioactive waste and spent nuclear fuel. The present revised publication provides a concise summary of key issues related to the development of a sound radioactive waste and spent nuclear fuel management system. It is intended to brief countries with small or newly established nuclear power programmes about the challenges of, and to describe current and potential alternatives for, managing reactor waste and spent fuel arising during operation and decommissioning of nuclear power plants.

English (56 pp., 9 figs; 2018) | ISBN 978-92-0-103118-1 | STI/PUB/1825 | €32.00

Status and Trends in Spent Fuel and Radioactive Waste Management

IAEA Nuclear Energy Series No. NW-T-1.14



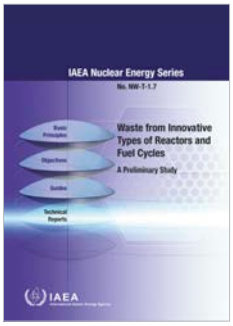
Based on the outcome of a collaborative project undertaken by the IAEA, OECD-NEA and the European Commission, this publication provides a global overview of the status of radioactive waste and spent fuel management concerning inventories, programmes, current practices, technologies and trends. It includes an analysis of national arrangements and programmes for radioactive waste and spent fuel management, an overview of current waste and spent fuel inventories and estimates of future amounts. International and national trends in these areas are also addressed.

English (57 pp., 25 figs; 2018) | ISBN 978-92-0-108417-0 | STI/PUB/1799 | €39.00

Waste from Innovative Types of Reactors and Fuel Cycles

A Preliminary Study

IAEA Nuclear Energy Series No. NW-T-1.7



For reactors currently operating, the types of waste expected to be generated under the normal operating regime are known and, aside from a few problematic wastes (such as graphite, tritium and radiocarbon), most of these wastes have clearly defined cradle-to-grave (end-to-end) pathways. However, for advanced and innovative reactors and their fuel cycles, some waste types may have new or different properties or might be problematic for processing with the currently available technologies. One of the primary challenges for advanced and innovative reactors and their nuclear fuel cycles is that solutions must be identified for all eventually problematic wastes prior to initiating construction of these facilities. This publication sets the stage for considering the waste generation of advanced fuel fabrication, reactor operation and decommissioning, reprocessing of spent fuel and waste pathways early in the development of new reactors and their associated fuel cycles. It describes waste flows in broad chemical and physical terms and identifies possible processing, recycling and disposition pathways. The publication is intended to support the nuclear industry in taking an early and integrated approach to waste management.

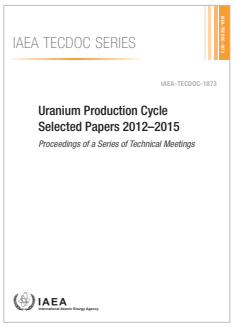
English (117 pp., 32 figs; 2019) | ISBN 978-92-0-102818-1 | STI/PUB/1822 | €41.00

URANIUM ORE PROCESSING

Uranium Production Cycle Selected Papers 2012–2015

Proceedings of a Series of Technical Meetings

IAEA TECDOC Series No. 1873

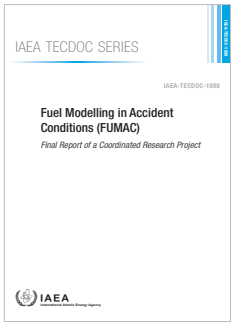


This volume contains selected contributions from a range of uranium production cycle meetings, particularly those of the Uranium Mining and Remediation Exchange Group (UMREG). UMREG brings together practitioners from all parts of the uranium mining industry to discuss ideas and exchange experiences related predominantly to remediation and legacy site management. This publication is the second volume to include selected UMREG papers with the common theme of good practices in the uranium production cycle. They were presented at several IAEA technical meetings and reflect the work done in Member States over the period 2012–2015. The topic areas include uranium supply and demand; uranium geology and deposits; uranium exploration; uranium mining and milling; waste management; and environmental issues.

English (306 pp., 85 figs; 2019) | ISBN 978-92-0-103019-1 | IAEA-TECDOC-1873 | €18.00

Fuel Modelling in Accident Conditions (FUMAC)

IAEA TECDOC Series No. 1889

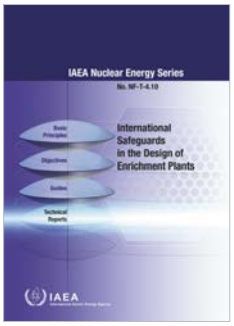


This publication summarizes the findings and conclusions of an IAEA coordinated research project on fuel modelling in accident conditions, which was initiated under the IAEA Action Plan on Nuclear Safety following the Fukushima Daiichi accident. The overall aim of the project was to analyse and better understand fuel behaviour in accident conditions, with a focus on loss of coolant accidents. In the course of the project the participants used a mixture of data derived from accident simulation experiments, in particular data designed to investigate fuel behaviour during design basis accident and design extension conditions. They carried out calculations on priority cases selected from a matrix of cases identified at the first research coordination meeting and designed to support their individual priorities. These priority cases were chosen as the best available to help determine which of the many models used in the codes best reflect reality. The coordinated research projects provided an ideal platform for participants to compare their code results with other results and especially with experimental data, to which they otherwise would not have had access.

English (180 pp., 175 figs; 2019) | ISBN 978-92-0-163919-6 | IAEA-TECDOC-1889 | €18.00

International Safeguards in the Design of Enrichment Plants

IAEA Nuclear Energy Series No. NF-T-4.10



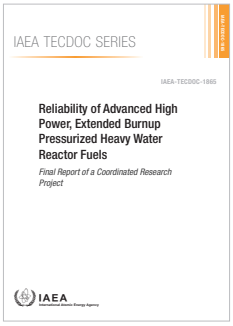
This publication is part of a series that aims to inform nuclear facility designers, vendors, operators and State governments, about IAEA safeguards and how associated requirements can be considered early in the design phase of a new nuclear facility. This particular publication is applicable to the design and construction of commercial uranium enrichment plants. Safeguards by design dialogue undertaken early in the design and construction of enrichment plants facilitates the implementation of safeguards throughout all the life cycle stages of the facility. The potential to reduce costs, avoid retrofits and achieve efficiencies, both for the operator and for IAEA Member States, are important drivers for the early consideration of safeguards in a nuclear facility design project.

English (44 pp., 11 figs; 2019) | ISBN 978-92-0-104419-8 | STI/PUB/1865 | €35.00

Reliability of Advanced High Power, Extended Burnup Pressurized Heavy Water Reactor Fuels

Final Report of a Coordinated Research Project

IAEA TECDOC Series No. 1865



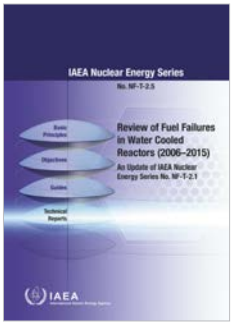
This publication presents a comprehensive summary of the technical work carried out under an IAEA coordinated research project and provides an overview of Member States' approaches to mitigating challenges that are encountered in achieving reliability, sustainability and safety with advanced pressurized heavy water reactor (PHWR) fuels. These challenges, which were discussed and analysed by the project participants, include fuel performance degradation, insufficient availability of operating experience at high burnup and margin erosion by ageing.

English (122 pp., 70 figs; 2019) | ISBN 978-92-0-101319-4 | IAEA-TECDOC-1865 | €18.00

Review of Fuel Failures in Water Cooled Reactors (2006–2015)

An Update of IAEA Nuclear Energy Series No. NF-T-2.1

IAEA Nuclear Energy Series No. NF-T-2.5



Since the 1970s, the IAEA has been involved in the analysis of fuel failures in water cooled reactors in normal (non-accident) operational conditions. This updated version of IAEA Nuclear Energy Series No. NF-T-2.1 provides information on all aspects of fuel failures in current nuclear power plant operations. It summarizes fuel failure occurrences and their mechanisms and root causes, as well as fuel failure prevention and management in plant operation for 97% of light and heavy water cooled nuclear power units operated worldwide during the period 2006–2015. Data on fuel failures from 1987 to 2006 extracted from three previous IAEA fuel failure reports are included and analysed in the present publication, together with the 2006–2015 fuel failure data, to reveal long term tendencies in fuel performance. In addition to fuel rod leakers, fuel structural damage and other fuel assembly issues are considered in the report.

English (65 pp.; 22 figs; 2019) | ISBN 978-92-0-104319-1 | STI/PUB/1864 | €35.00

Behaviour of Spent Power Reactor Fuel during Storage

Extracts from the Final Reports of Coordinated Research Projects on Behaviour of Spent Fuel Assemblies in Storage (BEFAST I–III) and Spent Fuel Performance Assessment and Research (SPAR I–III) — 1981–2014

IAEA TECDOC Series No. 1862

This publication focuses on the storage of spent nuclear fuel from power reactors, which is a topic of increasing importance to Member States. To support their needs, the IAEA has carried out successive coordinated research projects on spent fuel performance and the behaviour of spent fuel assemblies in storage since the 1980s. The findings of these projects have been reported in a series of publications over the past 30 years. The current publication consolidates these findings and compiles all relevant information in one referenceable source. The technical information provided in this publication will be particularly useful for experts engaged in safety assessments.

English (126 pp., 59 figs; 2019) | ISBN 978-92-0-100319-5 | IAEA-TECDOC-1862 | €18.00

Demonstrating Performance of Spent Fuel and Related Storage System Components during Very Long Term Storage

Final Report of a Coordinated Research Project

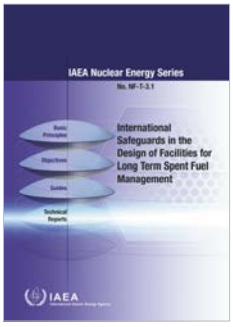
IAEA TECDOC Series No. 1878

This publication summarizes the work carried out during an IAEA coordinated research project on safe and reliable management of spent nuclear fuel. This work contributes to the overall goal of demonstrating the performance of spent nuclear fuel and related storage system components over long durations, and facilitates the transfer of this knowledge to Member States. The technical areas addressed by the project participants were related to potential degradation mechanisms in metal casks and concrete overpacks, such as stress corrosion cracking; long term integrity and performance of the fuel cladding; thermomechanical behaviour of the metal seals; and long term gamma and neutron shielding capability. The participants also considered past and ongoing demonstration programmes. For each technical topic addressed the main conclusions have been drawn, including information on the development of specific monitoring and inspection techniques as well as future opportunities for closing relevant data gaps. A major achievement is also the establishment of a worldwide network of experts working on current research projects to demonstrate the long term performance of spent fuel in dry storage systems.

English (188 pp., 103 figs; 2019) | ISBN 978-92-0-103319-2 | IAEA-TECDOC-1878 | €18.00

International Safeguards in the Design of Facilities for Long Term Spent Fuel Management

IAEA Nuclear Energy Series No. NF-T-3.1



This publication is the fifth in the IAEA Nuclear Energy Series to provide guidance on the inclusion of safeguards in nuclear facility design and construction. It is principally intended for designers and operators of facilities for long term spent fuel management; however, vendors, national authorities and financial backers can also benefit from the information provided. The publication complements the general considerations addressed in International Safeguards in Nuclear Facility Design and Construction, IAEA Nuclear Energy Series No. NP-T-2.8.

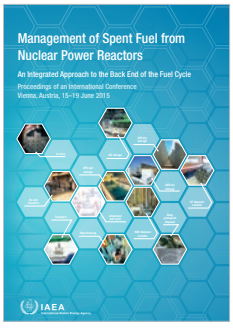
English (70 pp., 25 figs; 2018) | ISBN 978-92-0-100717-9 | STI/PUB/1767 | €36.00

Management of Spent Fuel from Nuclear Power Reactors

An Integrated Approach to the Back End of the Fuel Cycle

Proceedings of an International Conference Held in Vienna, Austria, 15–19 June 2015

Proceedings Series



These proceedings present the outcome of the 2015 IAEA international conference on the management of spent fuel from nuclear power reactors. Achievements and lessons learned in connection with the back end of the nuclear fuel cycle and associated challenges were shared and reviewed. The conference was organized around seven themes, covering spent fuel management strategies; status and challenges in an integrated approach; safety aspects of spent fuel management; ageing management programmes; storage options in support of an integrated approach; impact of the front end of the nuclear fuel cycle on the back end; and research and development required to deliver an integrated approach. Key goals were to raise awareness on how developments in power generation and availability of disposal can impact spent fuel management, to evaluate the advances in management of spent fuel from power reactors since the inception of IAEA conferences on this topic, and to identify pending issues and anticipated future challenges. The main ideas and messages expressed and discussed at the conference are presented in the opening addresses, the session summaries and the President's summary and conclusions of the conference. The attached CD-ROM contains the papers and posters presented at the conference.

English (40 pp.; 2019) | ISBN 978-92-0-101819-9 | STI/PUB/1850 | €28.00

Storage of Spent Nuclear Fuel

Specific Safety Guide

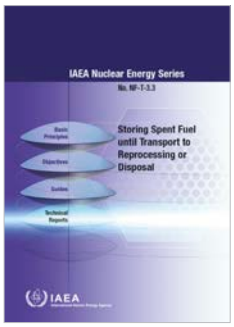
IAEA Safety Standards Series No. SSG-15 (Rev. 1)

This publication is a revision by amendment of IAEA Safety Standards Series No. SSG-15 and provides recommendations and guidance on the storage of spent nuclear fuel. It covers all types of storage facility and all types of spent fuel from nuclear power plants and research reactors. It takes into consideration the longer storage periods beyond the original design lifetime of the storage facility that have become necessary owing to delays in the development of disposal facilities and the reduction in reprocessing activities. It also considers developments associated with nuclear fuel, such as higher enrichment, mixed oxide fuels and higher burnup. Guidance is provided on all stages in the lifetime of a spent fuel storage facility, from planning through siting and design to operation and decommissioning. The revision was undertaken by amending, adding and/or deleting specific paragraphs addressing recommendations and findings from studying the accident at the Fukushima Daiichi nuclear power plant in Japan.

English (Forthcoming) | ISBN 978-92-0-106119-5 | STI/PUB/1882 | €42.00

Storing Spent Fuel until Transport to Reprocessing or Disposal

IAEA Nuclear Energy Series No. NF-T-3.3



This publication identifies issues and challenges relevant to the development and implementation of options, policies, strategies and programmes for ensuring safe, secure, and effective storage of spent fuel until transport for reprocessing or disposal. The target audience of this publication includes policy and decision makers who need to be aware of the implicit risks and costs associated with decision timing for determining and implementing an end point for spent fuel management (such as reprocessing or disposal) to ensure the responsible and sustainable use of nuclear energy. The publication will assist those within the nuclear industry in communicating the importance of a clear, credible and sustainable spent fuel management strategy and will encourage decision makers to consider different approaches that may be useful in addressing the uncertainties resulting from an unknown storage duration and an undefined end point for spent fuel management.

English (40 pp., 4 figs; 2019) | ISBN 978-92-0-100719-3 | STI/PUB/1846 | €35.00

Costing Methods and Funding Schemes for Radioactive Waste Disposal Programmes

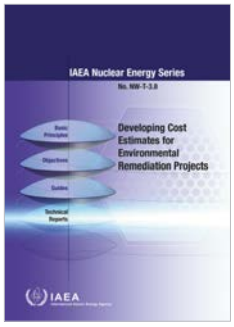
IAEA Nuclear Energy Series No. NW-T-1.25

Reliable methods for estimating the cost of a radioactive waste disposal programme are crucial to ensure that the necessary funding for completing the disposal programme is available. Estimating the cost for disposal is, however, a challenging and complex task. Disposal programmes themselves are complex and long term undertakings, and conditions can be expected to change significantly over the time span during which a disposal programme is developed and implemented. This publication provides Member States with information on developing cost estimates for a disposal programme and establishing funding mechanisms. It will help readers in becoming informed clients by familiarizing themselves with the approaches and complexities in cost estimates and funding mechanisms for disposal. The publication is applicable to all waste categories and both near surface and geological disposal. It contains relevant examples and case studies from national programmes. The cost figures are intended to give an indication of the possible cost of certain parts or aspects of the disposal programme rather than to compare different disposal programmes' costs.

English (Forthcoming) | ISBN 978-92-0-108819-2 | STI/PUB/1900 | €40.00

Developing Cost Estimates for Environmental Remediation Projects

IAEA Nuclear Energy Series No. NW-T-3.8



This publication addresses costs arising during individual phases of an environmental remediation project, how they can be calculated, and how they can be structured and documented. It provides the methodology of cost estimation and includes examples of cost estimate models, development plans, cost elements and work breakdown structures. The publication also contains an overview of potentially suitable remediation technologies, which may help the reader to structure the options study.

English (85 pp., 10 figs; 2019) | ISBN 978-92-0-103219-5 | STI/PUB/1857 | €41.00

Environmental Impact Assessment of the Drawdown of the Chernobyl NPP Cooling Pond as a Basis for Its Decommissioning and Remediation

IAEA TECDOC Series No. 1886

This publication provides technical and scientific information regarding the radiation monitoring, radio-ecological research and management of the Chernobyl nuclear power plant cooling pond. It focuses on the assessment of the environmental and radiological conditions after the pond drawdown, as a basis for justification of the decommissioning and remediation strategy for the pond. Special attention is paid to the analyses of remedial actions to reduce ongoing or potential doses to members of the public and plant staff due to radiological impacts resulting from the drawdown of water level in the pond. The publication also outlines practical experience gained throughout the cooling pond decommissioning project, which started in 2014 and continues into the present. It presents data from a monitoring programme, comparing modelling predictions of the dynamics of the cooling pond drainage and related radiological and ecological impacts, with the consequences of the drawdown of the water level in the cooling pond that were actually observed. Additionally, the publication summarizes lessons learned and addresses outstanding issues.

English (189 pp., 83 figs; 2019) | ISBN 978-92-0-161619-7 | IAEA-TECDOC-1886 | €18.00

PLASMA PHYSICS AND NUCLEAR FUSION

Conceptual Development of Steady State Compact Fusion Neutron Sources

Report of a Coordinated Research Project

IAEA TECDOC Series No. 1875

Fusion neutron sources have many important practical uses, including triggering fission reactions, manufacturing medical isotopes, testing materials and components for use in future fusion power reactors, and facilitating the production of various isotopes like tritium. All these applications can be potentially improved by achieving high energy compact fusion neutron sources (CFNSs). The present publication is a compilation of the main results and findings of an IAEA coordinated research project on the development of concepts and conceptual designs for both low and high power CFNSs. Through the collaboration of experts in the participating Member States, the results achieved under the project laid the foundation for practical applications of intense fusion neutron sources.

English (32 pp., 6 figs; 2019) | ISBN 978-92-0-103519-6 | IAEA-TECDOC-1875 | €18.00

Integrated Approach to Safety Classification of Mechanical Components for Fusion Applications

IAEA TECDOC Series No. 1851

This TECDOC is the first IAEA publication on safety classification of components for fusion applications. It highlights the existing differences between fission and fusion reactors in identification and classification of structures, systems and components that are important to safety and offers practical information for fusion applications. The publication also provides information on inclusion of the new design extension conditions, which have been added after the review of IAEA Safety Guides following the Fukushima Daiichi nuclear power plant accident.

English (130 pp., 26 figs; 2018) | ISBN 978-92-0-105518-7 | IAEA-TECDOC-1851 | €18.00

Atomic and Plasma–Material Interaction Data for Fusion

Volume 18

The present volume of Atomic and Plasma–Material Interaction Data for Fusion presents the results of a coordinated research project on plasma–wall interaction with irradiated tungsten and tungsten alloys in fusion devices. The chemical element tungsten is widely foreseen as a plasma-facing material in a fusion reactor, where it is subject to an intense neutron radiation flux. This publication provides details of a five year project devoted to better understanding the properties of tungsten in this environment through experimental study and theoretical modelling. Of particular practical concern is the viability of the metal as a structural material after irradiation damage, and its increased propensity to absorb the tritium fuel used in a fusion reaction.

English (212 pp., 147 figs; 2019) | ISBN 978-92-0-109119-2 | STI/PUB/023/APID/18 | €40.00

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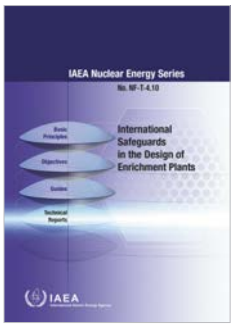
International Safeguards in the Design of Enrichment Plants

IAEA Nuclear Energy Series No. NF-T-4.10

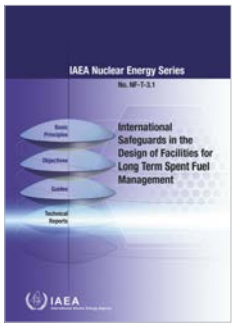


This publication is part of a series that aims to inform nuclear facility designers, vendors, operators and State governments, about IAEA safeguards and how associated requirements can be considered early in the design phase of a new nuclear facility. This particular publication is applicable to the design and construction of commercial uranium enrichment plants. Safeguards by design dialogue undertaken early in the design and construction of enrichments plants facilitates the implementation of safeguards throughout all the life cycle stages of the facility. The potential to reduce costs, avoid retrofits and achieve efficiencies, both for the operator and for IAEA Member States, are important drivers for the early consideration of safeguards in a nuclear facility design project.

English (44 pp., 11 figs; 2019) | ISBN 978-92-0-104419-8 | STI/PUB/1865 | €35.00

International Safeguards in the Design of Facilities for Long Term Spent Fuel Management

IAEA Nuclear Energy Series No. NF-T-3.1

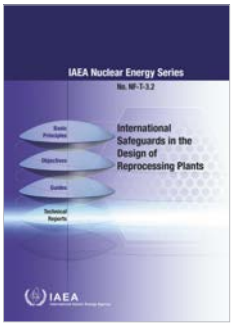


This publication is the fifth in the IAEA Nuclear Energy Series to provide guidance on the inclusion of safeguards in nuclear facility design and construction. It is principally intended for designers and operators of facilities for long term spent fuel management; however, vendors, national authorities and financial backers can also benefit from the information provided. The publication complements the general considerations addressed in International Safeguards in Nuclear Facility Design and Construction, IAEA Nuclear Energy Series No. NP-T-2.8.

English (70 pp., 25 figs; 2018) | ISBN 978-92-0-100717-9 | STI/PUB/1767 | €36.00

International Safeguards in the Design of Reprocessing Plants

IAEA Nuclear Energy Series No. NF-T-3.2



This publication is part of a series that aims to inform nuclear facility designers, vendors, operators and State governments about IAEA safeguards and how associated requirements can be considered early in the design phase of a new nuclear facility. This particular publication is applicable to the design of spent nuclear fuel reprocessing plants. Safeguards by design dialogue undertaken early in the design and construction of reprocessing plants, facilitates the implementation of safeguards throughout all the life cycle stages of the facility. The potential to reduce costs, avoid retrofits and achieve efficiencies both for the operator and for IAEA Member States, are important drivers for the early consideration of safeguards in a nuclear facility design project.

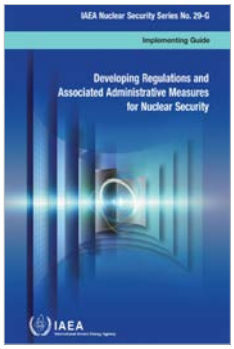
English (62 pp., 15 figs; 2019) | ISBN 978-92-0-104519-5 | STI/PUB/1866 | €34.00

NUCLEAR LAW

Developing Regulations and Associated Administrative Measures for Nuclear Security

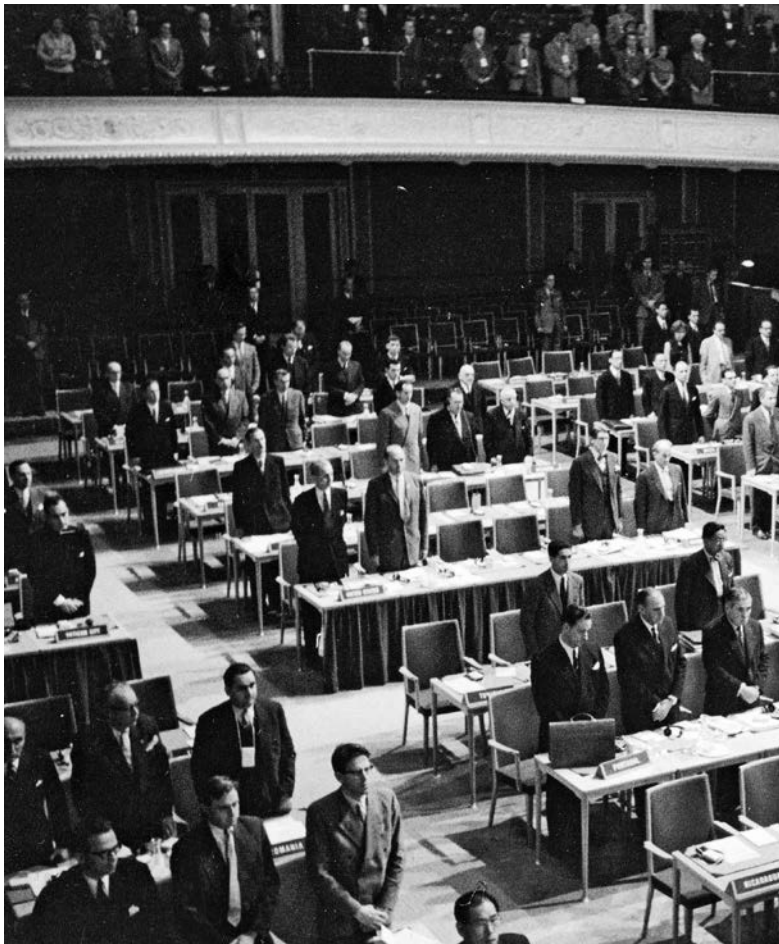
Implementing Guide

IAEA Nuclear Security Series No. 29-G



This publication aims to assist States in identifying the responsibilities of those involved in nuclear security so that suitable regulations, agreements and associated administrative measures may be developed for establishing and sustaining an effective nuclear security regime. The publication is structured to provide an overview of the most important aspects to be covered by a State's legislative and regulatory framework for governing nuclear security. States may therefore use this publication to undertake a gap analysis of their legislative and regulatory framework for nuclear security in order to take actions to update their framework as necessary.

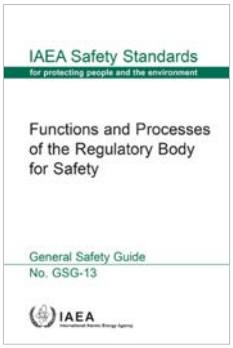
English (60 pp.; 2018) | ISBN 978-92-0-111716-8 | STI/PUB/1762 | €39.00



Functions and Processes of the Regulatory Body for Safety

General Safety Guide

IAEA Safety Standards Series No. GSG-13



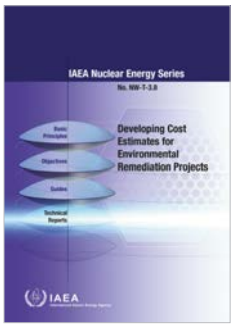
This Safety Guide provides recommendations on meeting the requirements of IAEA Safety Standards Series No. GSR Part 1 (Rev. 1), Governmental, Legal and Regulatory Framework for Safety, on the regulatory body's core functions and associated regulatory processes. This guidance is particularly important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

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

ENVIRONMENT

Developing Cost Estimates for Environmental Remediation Projects

IAEA Nuclear Energy Series No. NW-T-3.8

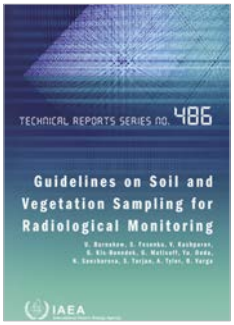


This publication addresses costs arising during individual phases of an environmental remediation project, how they can be calculated, and how they can be structured and documented. It provides the methodology of cost estimation and includes examples of cost estimate models, development plans, cost elements and work breakdown structures. The publication also contains an overview of potentially suitable remediation technologies, which may help the reader to structure the options study.

English (85 pp.; 10 figs; 2019) | ISBN 978-92-0-103219-5 | STI/PUB/1857 | €41.00

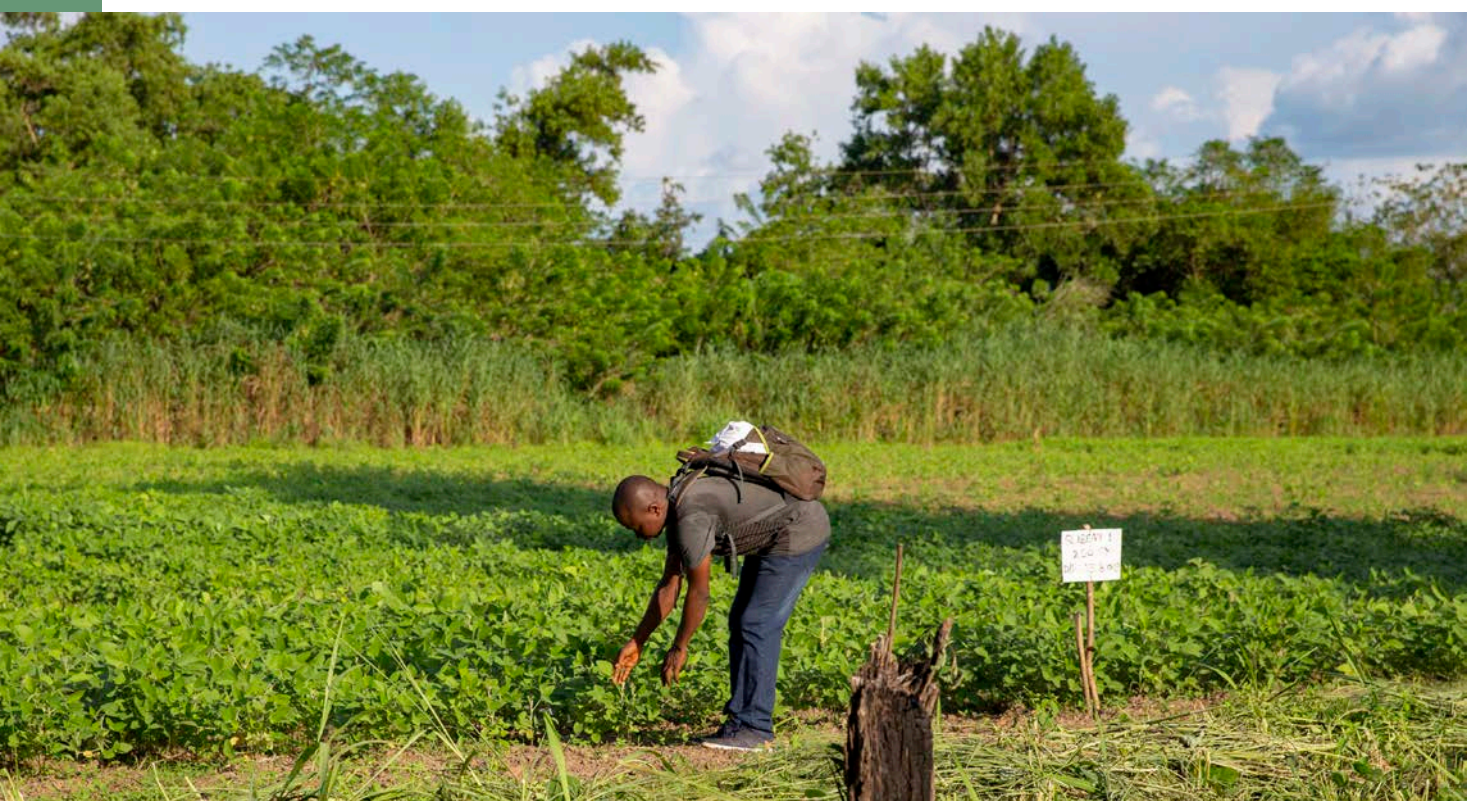
Guidelines on Soil and Vegetation Sampling for Radiological Monitoring

Technical Reports Series No. 486



This publication addresses the sampling of soil and vegetation in terrestrial ecosystems, including agricultural, forest and urban environments, contaminated with radionuclides from events such as radiation accidents, radiological incidents and past nuclear activities. It considers sampling strategies and programmes, which are relevant for both emergency and existing exposure situations. Practical information is provided on the design and implementation of sampling programmes for soil and vegetation within the framework of environmental monitoring. Examples of best practice on the formulation of optimized sampling strategies for different exposure situations are given based on the experience and lessons learned from implementation of past and existing programmes.

English (247 pp.; 92 figs; 2019) | ISBN 978-92-0-102218-9 | STI/DOC/010/486 | €76.00

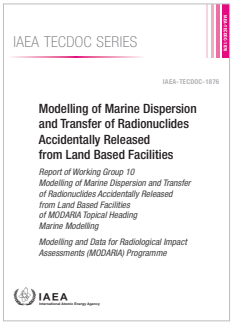


Modelling of Marine Dispersion and Transfer of Radionuclides Accidentally Released from Land Based Facilities

Report of Working Group 10
Modelling of Marine Dispersion and Transfer of Radionuclides Accidentally Released from Land Based Facilities of MODARIA Topical Heading Marine Modelling

Modelling and Data for Radiological Impact Assessments (MODARIA) Programme

IAEA TECDOC Series No. 1876



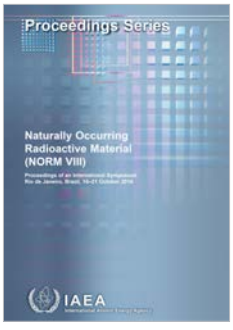
This publication describes and summarizes the work of the MODARIA (Modelling and Data for Radiological Impact Assessments) Programme Working Group 10. MODARIA was set up to continue the IAEA's activities in the field of testing, comparing and developing guidance on the application of models to assess radiation exposures to humans, and radiological impacts on the environment. Different aspects of the MODARIA programme were addressed by ten working groups. The current publication presents the work undertaken by Working Group 10 on the modelling of marine dispersion and transfer of radionuclides accidentally released from land based facilities. Two marine dispersion scenarios were studied. These scenarios simulated dispersion of radionuclides in the Baltic Sea following the Chernobyl accident, and dispersion in the Pacific Ocean following the Fukushima Daiichi nuclear power plant accident. The publication details some general conclusions and presents a comparison of model performance when applied to the above scenarios. The difficulties of developing operative modelling systems for supporting decision making in cases of emergencies in highly dynamic environments are highlighted.

English (144 pp., 36 figs; 2019) | ISBN 978-92-0-103619-3 | IAEA-TECDOC-1876 | €18.00

Naturally Occurring Radioactive Material (NORM VIII)

Proceedings of an International Symposium Held in Rio de Janeiro, Brazil, 18–21 October 2016

Proceedings Series



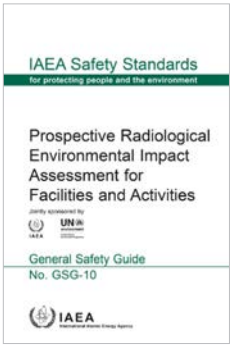
These proceedings present the outcome of the eighth symposium on naturally occurring radioactive material (NORM). The symposium provided an important opportunity to review recent technical and regulatory developments concerning exposure to NORM, with the overall objectives of addressing radiation protection issues, discussing the results of new research, exploring practical case studies of industrial applications, and identifying new societal needs and technical requirements for regulatory bodies and industries involving NORM. The symposium provided a platform for experts from industries, academic and research institutions, and regulatory bodies from all over the world to share experiences, identify opportunities, analyse current challenges, and review progress made in identifying, quantifying and managing the radiological risks associated with industrial processes involving NORM. Ongoing activities to implement new international standards during the period since the last NORM symposium in 2013 provided an important backdrop to the presentations and discussion. The proceedings contain 31 papers that were accepted for oral presentation, text versions of 35 poster presentations and a summary that concludes with the main findings of the symposium.

English (422 pp.; 2018) | ISBN 978-92-0-107618-2 | STI/PUB/1832 | €50.00

Prospective Radiological Environmental Impact Assessment for Facilities and Activities

General Safety Guide

IAEA Safety Standards Series No. GSG-10



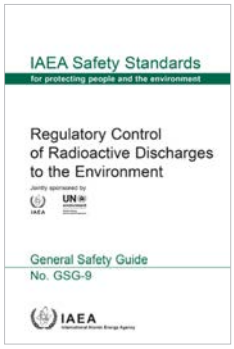
This Safety Guide provides recommendations and guidance on a general framework for performing prospective radiological impact assessments for facilities and activities, to estimate and control the radiological effects on the public and on the environment. This radiological environmental impact assessment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

English (82 pp., 5 figs; 2018) | ISBN 978-92-0-102518-0 | STI/PUB/1819 | €42.00

Regulatory Control of Radioactive Discharges to the Environment

General Safety Guide

IAEA Safety Standards Series No. GSG-9

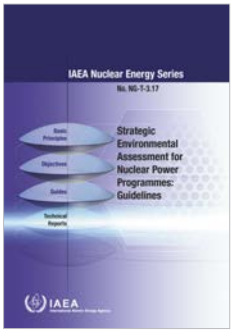


This Safety Guide is intended to assist governments, regulatory bodies, applicants for a licence and operating organizations with a structured approach to controlling radiation exposures of the public resulting from discharges from normal operations of facilities and activities, and with the optimization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

English (71 pp., 5 figs; 2018) | ISBN 978-92-0-102418-3 | STI/PUB/1818 | €42.00

Strategic Environmental Assessment for Nuclear Power Programmes: Guidelines

IAEA Nuclear Energy Series No. NG-T-3.17



This publication provides practical information on performing strategic environmental assessments (SEAs) for nuclear power programmes. It incorporates the latest knowledge and draws on best practices in conducting SEAs. Based on inputs from SEA experts from across the world, it lays down an effective SEA process that contributes to strengthening decision making for nuclear power programmes; achieving environmentally sound and sustainable development; and improving good governance and building public trust and confidence in decision making. Importantly, SEA for nuclear power programmes can ensure effective communication with the public and other stakeholders. Consequently, significant emphasis is placed on stakeholder engagement and public participation. Further, appropriate tools for assessment and quality review are presented for all stages of the SEA process.

English (74 pp., 17 figs; 2018) | ISBN 978-92-0-104418-1 | STI/PUB/1815 | €36.00

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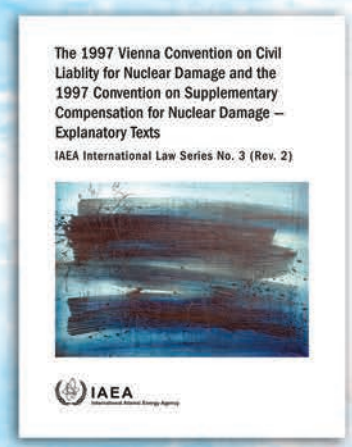

This publication reproduces the explanatory texts on the nuclear liability instruments adopted under the IAEA's auspices in 1997. Finalized by the International Expert Group on Nuclear Liability (INLEX), these texts constitute a comprehensive study and authoritative interpretation of the IAEA's nuclear liability regime. More particularly, the texts deal with the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage and the Convention on Supplementary Compensation for Nuclear Damage. The publication includes an overview, and brings together the texts, of the IAEA's nuclear liability instruments. It also includes a matrix of comparative provisions in the various nuclear liability instruments, as well as the recommendations on how to achieve a global nuclear liability regime that were adopted by INLEX in 2012 following a request by Member States reflected in the IAEA Action Plan on Nuclear Safety. The explanatory texts were first updated in 2017 in the light of these important developments, and this second revision reflects further discussions within INLEX. It is hoped that the texts and the other documents included in this publication will increase awareness of nuclear liability as an important aspect of nuclear law by becoming a useful tool for legislators, government officials, technical experts, lawyers and nuclear insurers.

English (158 pp.; 2020) |
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