

# New publications



## General interest

### The Strategic Plan of the Nuclear Energy Agency - 2005-2009

ISBN: 92-64-02081-0

Free: paper or web.

The new NEA Strategic Plan for 2005-2009 has recently been adopted. It offers a clear roadmap for achieving the goals that have been set by the NEA member countries, in particular in the areas

of nuclear safety, radioactive waste management, radiological protection, nuclear science and technology development, and legal affairs. The Plan specifically outlines priorities, goals and objectives, and how these are to be accomplished. At the same time, it provides sufficient flexibility to respond to both new and evolving priorities as they arise.

## Economic and technical aspects of the nuclear fuel cycle

### Nuclear Competence Building

ISBN 92-64-10850-5 – Price: € 24, US\$ 29, £ 17, ¥ 3 100.

In many countries, government R&D funding in the area of nuclear energy has been dramatically reduced or has disappeared altogether. At the same time, the profit margins of electricity generators have been severely squeezed. The combined effect has led to a reduction in technical innovation and the danger of the loss of technical competencies and skills in the area. However, because different countries are at different stages of the nuclear technology life cycle, these losses are not common to all countries, either in their nature or their extent. A competence that may have declined or been lost in one country may be strong in another. Therein lies one solution to the problems the sector faces: international collaboration. This report presents the results of an international survey on initiatives launched during recent years in the area of nuclear education and training. Key human resource

issues are discussed and many good practices regarding international collaboration are identified. The report includes an executive summary along with conclusions and recommendations aimed at policy makers and other stakeholders. It also contains an in-depth analysis of the factual information collected.

### Nuclear Competence Building

#### Summary Report

ISBN 92-64-02073-X

Free: paper or web.

This booklet, a summary of the full report, presents the main results of an international survey on initiatives launched during recent years in the area of nuclear education and training. Key human resource issues are discussed and good practices regarding international collaboration are identified.

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# Nuclear regulation and safety

## CSNI Technical Opinion Papers

### No. 6: PSA-based Event Analysis

ISBN 92-64-02091-8 – Free: paper or web.

This technical opinion paper provides the reader with a concise description of both the benefits and disadvantages of using probabilistic safety assessment (PSA) to analyse operational events in nuclear power plants in order to facilitate better operator feedback. The paper's objective is to present decision makers in the nuclear field with a clear technical opinion on how PSA techniques can be used to address this issue. The intended audience is primarily nuclear safety regulators, senior researchers and industry leaders. Government authorities, nuclear power plant operators and the general public may also be interested.

## Debris Impact on Emergency Coolant Recirculation

### Workshop Proceedings, Albuquerque, NM, USA, 25-27 February 2004

ISBN: 92-64-00666-4

Price: € 90, US\$ 113, £ 62, ¥ 11500.

Under normal operation, nuclear reactor fuel is cooled by water circulating in the primary circuit. In the case of a loss-of-coolant accident, the reactor is stopped automatically. Residual fuel heat must then be evacuated, typically by use of a safety injection system and a reactor containment spray system. These systems are fed with water recovered from the bottom of the containment through sumps. However, because this

water may contain debris (insulating material, concrete particles, paint), sumps are equipped with strainers. These strainers may become clogged, preventing emergency coolant recirculation. This could in turn lead to reactor core overheating, or melting in the most extreme circumstances. Participants at the workshop discussed the most recent research and developments in this field, as well as proposed and implemented solutions. These proceedings contain the papers presented at the workshop as well as a summary of the discussions that took place.

## Regulatory Challenges Related to Human Performance

ISBN: 92-64-02089-6

Free: paper or web.

In June 2003, the OECD Nuclear Energy Agency (NEA) Committee on Nuclear Regulatory Activities (CNRA) organised a topical session on the importance of human performance to nuclear safety and the factors influencing it. The discussion focused on three questions: Is human performance as important to the safety of nuclear installations as many references seem to indicate? Has the importance of human performance increased during the past five to ten years? What recommendations can be made on how to manage human performance challenges? This publication provides a summary of the introductory presentations as well as a description of the regulatory challenges identified during the discussions. The publication's intended audience is primarily nuclear regulators; it may also be of interest to technical support organisations, nuclear operators, governmental bodies and the general public.

# Radiological protection

## Stakeholder Participation in Radiological Decision Making: Processes and Implications

### Third Villigen Workshop, Villigen, Switzerland, 21-23 October 2003

ISBN: 92-64-10825-4 – Price: € 24, US\$ 30, £ 17, ¥ 3 000.

Since 1988, the OECD Nuclear Energy Agency has been organising a series of workshops to address

the various aspects of stakeholder involvement in radiological protection decision making. These workshops have been instrumental in forging consensus and improving understanding of key issues in this area. Building on the experience of the first two "Villigen workshops", the third in the series extensively analysed three case studies, which covered the licensing of a new facility, the clean-up and release of an old facility, and the rehabilitation of a large, contaminated area. Consideration was given to the stakeholder involvement processes that had been

used, and the implications that these did or could have on radiological protection policy, regulation and application. The workshop papers analysing these processes and implications are presented in these proceedings, which should provide valuable examples and lessons for governments, regulators and practitioners.

## Stakeholder Participation in Radiological Decision Making: Processes and Implications

### Summary Report of the 3<sup>rd</sup> Villigen (Switzerland) Workshop, October 2003

ISBN: 92-64-02079-9

Free: paper or web.

This summary seeks to answer the questions that radiological protection professionals ask when confronted with the need to consider stakeholder participation processes. As will become clear, there is no one-size-fits-all blueprint for such processes: the sheer range and diversity of the situations where they may be appropriate dictates a much more flexible approach. However, the workshop demonstrated that it is possible to identify common themes and features. These should aid professionals in developing participation processes without detracting from the flexibility needed to remain responsive to the particular demands and expectations of any given situation. The report is intended for policy makers and regulators with radiological protection responsibilities.

## Stakeholder Participation in Radiological Decision Making: Processes and Implications

### Case Studies for the Third Villigen Workshop, Villigen, Switzerland 21-23 October 2003

ISBN: 92-64-02065-9

Free: paper or web.

Within the radiological protection community, stakeholder issues have moved steadily to the forefront of policy discussions, and clearly form a key element in decisions regarding the development and implementation of radiological protection policy. It was in this light that the OECD Nuclear Energy Agency (NEA) undertook three case studies on stakeholder involvement processes and experiences. Experience and lessons were analysed and extracted that may have application to numerous situations in other national contexts. They are intended to aid decision makers and regulators who are involved in radiological protection, and may have particular value for post-accident contamination situations, the siting of new nuclear installations, the management of emissions from routine operations at nuclear facilities, and the decommissioning of existing nuclear installations. The three case studies presented in this report were specifically developed as input to the workshop and address the following situations: the Canadian review process for uranium production projects in Northern Saskatchewan; the Rocky Flats controversy on radionuclide action levels; and the ETHOS project for post-accident rehabilitation in the area of Belarus contaminated by the Chernobyl disaster.

## Radioactive waste management

### Decommissioning of Nuclear Power Facilities –

#### It can and has been done

*This brochure is also available in Italian as:*

### Decommissioning degli Impianti Nucleari –

#### Si può fare ed è stato fatto

Free: paper or web.

One concern commonly expressed about electricity production from nuclear power is that the decommissioning (i.e. dismantling to a desirable end state) of the redundant radioactive facilities presents a significant problem. In fact, international

experience shows that this is not the case. This brochure looks at decommissioning across the spectrum of nuclear power facilities and shows worldwide examples of successful projects.

### Engineered Barrier Systems (EBS): Design Requirements and Constraints

#### Workshop Proceedings, Turku, Finland, 26-29 August 2003

ISBN: 92-64-02068-3

Free: paper or web.

A joint NEA-EC workshop entitled "Engineered Barrier Systems: Design Requirements and Constraints" was organised in Turku, Finland on

26-29 August 2003 and hosted by Posiva Oy. The main objectives of the workshop were to promote interaction and collaboration among experts responsible for engineering design and safety assessment in order to develop a greater understanding of how to achieve the integration needed for the successful design of engineered barrier systems, and to clarify the role that an EBS can play in the overall safety case for a repository. These proceedings present the outcomes of this workshop.

## Geological Disposal: Building Confidence Using Multiple Lines of Evidence

First AMIGO Workshop Proceedings, Yverdon-les-Bains, Switzerland, 3-5 June 2003

ISBN: 92-64-01592-2 – Price: € 50, US\$ 63, £ 35, ¥ 6 400.

When preparing the safety case for a deep geological repository of radioactive waste, the integration of wide-ranging information from multidisciplinary sources is a complex task. This has provided the motivation for establishing AMIGO, an OECD/NEA international project on “Approaches and Methods for Integrating Geological Information in the Safety Case”. AMIGO is structured as a series of biannual topical workshops involving site characterisation and safety assessment practitioners with experience in both sedimentary and crystalline rock settings. The first AMIGO workshop was organised in Yverdon-les-Bains, Switzerland on 3-5 June 2003. The main objective of the workshop was to exchange views on building confidence in analyses and arguments that support the safety case using multiple lines of evidence and integrating the work of geoscientists and safety assessors. These proceedings present the outcomes of the workshop.

## Learning and Adapting to Societal Requirements for Radioactive Waste Management

Key Findings and Experience of the Forum on Stakeholder Confidence

ISBN: 92-64-02080-2 Free: paper or web.

This report presents a synthesis of the key findings and experience of the NEA Forum on Stakeholder Confidence regarding the governance of long-term radioactive waste management. Most of the main findings are of relevance to all public policy-making processes, not only to radioactive waste management. In this sense, the report reads as a primer on the concrete governance challenges facing complex, collective decision making.

## Post-closure Safety Case for Geological Repositories

Nature and Purpose

ISBN: 92-64-02075-6

Free: paper or web.

Disposal of long-lived radioactive waste in engineered facilities deep underground is being widely investigated worldwide in order to protect humans and the environment both now and in the future. This report defines and analyses the purpose and general contents of the post-closure safety cases for such facilities. The aim is to provide a point of reference for people involved in the development of safety cases and those with responsibility for, or interest in, decision making in radioactive waste management.

## Stakeholder Involvement Techniques

A Short Guide and Annotated Bibliography

ISBN: 92-64-02087-X

Free: paper or web.

Stakeholder involvement, dialogue and deliberation can improve the quality and the sustainability of policy decisions. This publication offers a short guide to stakeholder involvement techniques and their selection. It includes an annotated bibliography pointing to easily accessible handbooks and other resources. While it approaches the topic from the point of view of radioactive waste management, it is intended for any person or organisation considering stakeholder involvement in decision making.

## Stepwise Approach to Decision Making for Long-term Radioactive Waste Management

Experience, Issues and Guiding Principles

ISBN: 92-64-02077-2

Free: paper or web.

The decision-making process for developing and implementing long-term radioactive waste management (RWM) solutions extends over decades and involves both a multitude of actors/stakeholders and stages. In order to be sustainable and successful, a great deal of built-in flexibility is needed in designing and carrying out such processes. Concepts such as “stepwise decision making” and “adaptive staging” hold out a means by which the public, and especially the local public, can be meaningfully involved in the review and planning of radioactive waste management solutions. This review of stepwise decision making for long-term RWM pinpoints its current status, highlights its societal dimension and identifies implementation issues from both the point of view of social research and RWM

practitioners. There is convergence between these two perspectives, and general guiding principles and action goals are proposed as a basis for further discussion and development of the stepwise decision-making concept.

## Strategy Selection for the Decommissioning of Nuclear Facilities

Seminar Proceedings, Tarragona, Spain, 1-4 September 2003

ISBN: 92-64-01671-6 – Price: € 60, US\$ 75, £ 42, ¥ 7 700.

As modern nuclear power programmes mature and large, commercial nuclear power plants and fuel cycle facilities approach the end of their useful

life by reason of age, economics or change of policy on the use of nuclear power, new challenges associated with decommissioning and dismantling come to the fore. Politicians and the public may expect there to be a “right answer” to the choice of strategy for a particular type of facility, or even all facilities. Both this seminar and wider experience show that this is not the case. Local factors and national political positions have a significant input and often result in widely differing strategy approaches to broadly similar decommissioning projects. All facility owners represented at the seminar were able to demonstrate a rational process for strategy selection and compelling arguments for the choices made. In addition to the papers that were presented, these proceedings include a summary of the discussions that took place.

## Nuclear Law

### Nuclear Law Bulletin No. 73

(June 2004)

Two issues and supplements per year.

ISSN 0304-341X

2005 subscription: € 90, US\$ 103, £ 58, ¥ 12 200.

The *Nuclear Law Bulletin* is published twice a year in both English and French. It covers legislative developments in almost 60 countries around the world as well as reporting on relevant jurisprudence and administrative decisions, bilateral and international agreements and regulatory activities of international organisations.

### + Supplement to No. 73:

Croatia – Act on Nuclear Safety (promulgated on 21 October 2003)

ISBN 92-64-01710-0 – Price: € 21, US\$ 26, £ 15, ¥ 2 700.

### Nuclear Legislation: Analytical Study - 2002 and 2003 Updates

#### Regulatory and Institutional Framework for Nuclear Activities

ISBN: 92-64-01814-X – Price: € 60, US\$ 75, £ 42, ¥ 7 700.

This 2002-2003 update of the Analytical Study on Nuclear Legislation in OECD member countries consists of replacement chapters for Belgium, Canada, the Czech Republic, France, Germany, Ireland, Mexico, Poland, Portugal, Sweden, Switzerland and the United Kingdom. It is organised on the basis of a standardised format for all countries, thus facilitating the search for and comparison of information. This update is based on information which was made available to the NEA Secretariat by the end of 2003.

## Nuclear science and the Data Bank

### Basic Studies in the Field of High-temperature Engineering

Third Information Exchange Meeting, Ibaraki-ken, Japan, 11-12 September 2003

ISBN: 92-64-01601-5 – Price: € 65, US\$ 81, £ 45, ¥ 8 300.

In response to growing interest in high-temperature, gas-cooled reactors (HTGRs) in many countries and the need for improved materials for nuclear applications in high-temperature environments, the NEA organised the Third Information



Exchange Meeting on Basic Studies in the Field of High-temperature Engineering. The proceedings of this meeting provide an overview of high-temperature research currently under way, including studies on the behaviour of irradiated graphite and improvements in material properties under high-temperature irradiation. These proceedings also contain recommendations for further international work in the areas of high-temperature engineering.

## Benchmark on Beam Interruptions in an Accelerator-driven System

### Final Report on Phase II Calculations

ISBN: 92-64-02072-1

Free: paper or web.

In accelerator-driven system (ADS) development, it is important to evaluate temperature variations caused by beam trips, as this type of event in an ADS results in a temperature transient that can lead to thermal fatigue in the structural components of the subcritical system. A series of benchmarks is therefore being organised by the OECD Nuclear Energy Agency (NEA) for lead-bismuth-cooled and MOX-fuelled accelerator-driven systems. This report provides a comparative analysis of the Phase II calculation results of the beam trip transients at different power densities. In subsequent phases of the benchmark, temperature transients under irradiated fuel conditions will also be investigated. This report and those to follow will be of particular interest to ADS designers, including subcritical system physicists and accelerator scientists.

## Computing Radiation Dosimetry - CRD 2002

### Workshop Proceedings, Sacavém, Portugal, 22-23 June 2002

ISBN: 92-64-10823-8 – Price: € 65, US\$ 81, £ 45, ¥ 8 300.

Establishing reliable computational methods and tools for radiation dosimetry is of great importance today because of the increased use of radiation in a number of areas of science, technology and medical applications. Fields concerned include radiation protection, radiation shielding, radiation diagnostics and therapy, radiobiology, biophysics and radiation detection. A series of lectures delivered by experts provides the content of these workshop proceedings. They are a valuable reference for those wishing to better understand the most advanced computational methods in radiation dosimetry.

## JANIS - Version 2.1 (A Java-based Nuclear Data Display Program)

Available on request.

JANIS (Java-based nuclear information software) is a display program designed to facilitate the visualisation and manipulation of nuclear data. Its objective is to allow the user of nuclear data to access numerical values and graphical representations without prior knowledge of the storage format. It offers maximum flexibility for the comparison of different nuclear data sets.

## JEFF 3.0 Nuclear Data Library (The)

ISBN: 92-64-01046-7

Free: paper or web.

## Neutronics/Thermal-hydraulics Coupling in LWR Technology

### Vol. 1: CRISSUE-S – WP1: Data Requirements and Databases Needed for Transient Simulations and Qualification

ISBN: 92-64-02083-7

Free: paper or web.

The interaction between system thermal-hydraulics and 3-D neutron kinetics is relevant for both the safety and the design and operation of existing nuclear reactors and reactor cores. Today, advanced coupled thermal-hydraulics/neutronics computer tools along with powerful computers can perform realistic best-estimate analyses of complex power plant transients. The results provide new insights into the conservatism for the specification of relevant operational safety margins and can imply new optimisations of emergency operating procedures in existing plants. They also improve knowledge of the physical phenomena behind “old-fashioned” problems (critical issues) in light water reactor technology, and can specifically shed light on the interaction between thermal-hydraulics and neutronics that still can challenge the design and operation of nuclear power plants. This report is the first of a series of three. It is devoted to the assembly and the structure of the existing database related to this subject.

## Neutronics/Thermal-hydraulics Coupling in LWR Technology

### Vol. 2: CRISSUE-S – WP2: State-of-the-art Report

ISBN: 92-64-02084-5

Free: paper or web.

This second volume provides the state-of the art report on this subject.

## Neutronics/Thermal-hydraulics Coupling in LWR Technology

### Vol. 3: CRISSUE-S – WP3: Achievements and Recommendations Report

ISBN: 92-64-02085-3

Free: paper or web.

This third report summarises the results, selects the most important findings and indicates the industry position on the related subjects.

## Pyrochemical Separations in Nuclear Applications

### A Status Report

ISBN: 92-64-02071-3

Free: paper or web.

The treatment of spent nuclear fuel is presently performed by the industry using different aqueous chemical processes. Alternative dry processes, using pyrochemical methods, are beginning to receive greater attention due to their potential advantages for more compact reprocessing plant designs, as well as for reduced criticality and radiation dose risks. Effective transmutation of long-lived fission products and minor actinides will be based in future on multi-recycling of the fuel with very high burn-up and short cooling times, conditions for which pyrochemical methods offer various advantages over traditional aqueous processes. Closed nuclear fuel cycles, considered for the future generation of nuclear reactors, could also benefit from pyrochemical reprocessing methods. Studies of pyrochemical processes have so far been carried out at laboratory level. Much R&D work will still be required in order to upgrade these processes to the level of current industrial aqueous processing. This publication describes ongoing national programmes, collaborative international activities, present research needs and future applications for pyrochemical methods, used in the treatment of irradiated nuclear fuel. It will be of particular interest to nuclear scientists involved in the development of advanced fuel cycles.

## Shielding Aspects of Accelerators, Targets and Irradiation Facilities - SATIF 6

### Workshop Proceedings, Stanford, California, USA, 10-12 April 2002

ISBN: 92-64-01733-X – Price: € 95, US\$ 119, £ 66, ¥ 12 200.

Particle accelerators are used today for an increasing range of scientific and technological applications. They are very powerful tools for investigating the origin and structure of matter,

and for improving understanding of the interaction of radiation with materials, including the transmutation of nuclides and the beneficial or harmful effects of radiation. Particle accelerators are used to identify properties of molecules that can be used in pharmacy, for medical diagnosis and therapy, and for biophysics studies. Particle accelerators must be operated in safe ways that protect the operators, the population and the environment. New technological and research applications give rise to new issues in radiation shielding. These workshop proceedings review the state of the art in radiation shielding of accelerator facilities and irradiated targets. They also evaluate advancements and discuss the additional developments required to meet radiation protection needs.

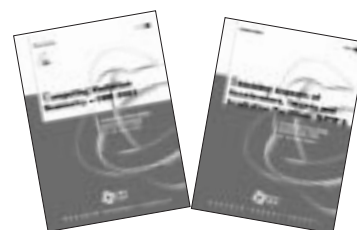
## The Need for Integral Critical Experiments with Low-moderated MOX Fuels

### Workshop Proceedings, Paris, France 14-15 April 2004

ISBN: 92-64-02078-0

Free: paper or web.

The use of MOX fuel in commercial reactors is a means of burning plutonium originating from either surplus weapons or reprocessed irradiated uranium fuel. This requires the fabrication of MOX assemblies on an industrial scale. The OECD/NEA Expert Group on Experimental Needs for Criticality Safety has highlighted MOX fuel manufacturing as an area in which there is a specific need for additional experimental data for validation purposes. Indeed, integral experiments with low-moderated MOX fuel are either scarce or not sufficiently accurate to provide an appropriate degree of validation of nuclear data and computer codes. New and accurate experimental data would enable a better optimisation of the fabrication process by decreasing the uncertainties in the determination of multiplication factors of configurations such as the homogenisation of MOX powders. This report contains the proceedings of a workshop organised by the OECD/NEA Nuclear Science Committee. Issues debated include the expression of research needs, proposals of experimental programmes and prospects for an international cooperative programme to address these needs.



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