New publications

Economic and technical aspects of the nuclear fuel cycle

Accelerator-driven Systems (ADS) and Fast Reactors (FR) in Advanced Nuclear Fuel Cycles

A Comparative Study

ISBN 92-64-18482-1 – Free on request.

The long-term hazard of radioactive waste arising from nuclear energy production is a matter of continued discussion and public concern in many countries. Through partitioning and transmutation (P&T) of the actinides and some of the long-lived fission products, the radiotoxicity of high-level waste (HLW) can be reduced by a factor of 100 compared with the current once-through fuel cycle. This requires very effective reactor and fuel cycle strategies, including fast reactors (FR) and/or accelerator-driven, sub-critical systems (ADS). The present study compares FR- and ADS-based actinide transmutation systems with respect to reactor properties, fuel cycle requirements, safety, economic aspects and R&D needs. Several advanced fuel cycle strategies are analysed in a consistent manner to provide insight into the essential differences between the various systems in which the role of ADS is emphasised. The report includes a summary aimed at policy makers and research managers as well as a detailed technical section for experts in this domain.

Nuclear Energy and the Kyoto Protocol

ISBN 92-64-18486-4 – Free on request.

The implementation of the Kyoto Protocol and the application of its "flexible mechanisms" are at the forefront of energy policy debates in most OECD countries. The potential role of nuclear energy in this context is viewed very differently and assessed against various criteria by the range of stakeholders in governments and civil society according to their interests and priorities. This book provides key facts concerning nuclear energy and the Kyoto Protocol. It highlights the challenges and opportunities for the future development of nuclear energy in the context of implementing the Kyoto Protocol, and more broadly in alleviating the risks of global climate change. The report will be of interest to energy policy makers and senior experts in the field as well as to members of civil society eager to better understand the issues raised within the debate on the role of nuclear energy in sustainable development. It will assist in making the necessary trade-offs involved in addressing global climate change concerns.

Nuclear Energy Data – 2002

ISBN 92-64-09899-2 – Price: € 20, US$ 20, £ 13, ¥ 2 350.

This new edition of *Nuclear Energy Data*, the OECD Nuclear Energy Agency's annual compilation of essential statistics on nuclear energy in OECD countries, offers additional textual and graphical information as compared with previous editions. It provides the reader with a comprehensive but easy-to-access overview on the status of and trends in the nuclear power and fuel cycle sector. This publication is an authoritative information source of interest to policy makers, experts and academics involved in the nuclear energy field.

Society and Nuclear Energy: Towards a Better Understanding

ISBN 92-64-18494-5 – Free on request.

While signs of a possible nuclear energy renaissance are visible worldwide, it is highly important to understand better the views of civil society on nuclear technologies, how their risks are perceived, and how to establish effective communication between all stakeholders aiming at enhancing consensus building prior to decision making. This report is based upon an in-depth analysis of research work and published literature on risk perception and communication, public participation in policy and decision making and the evolution of public opinion on nuclear energy. It will be of interest to policy makers, governmental agencies and industry. Additionally, members of civil society and various stakeholders eager to learn more about social issues related to the development of nuclear energy will find relevant information in this report.

Uranium 2001: Resources, Production and Demand

ISBN 92-64-19823-7 – Price: € 85, US$ 74, £ 52, ¥ 9 850

The "Red Book", jointly prepared by the OECD Nuclear Energy Agency and the International Atomic Energy Agency, is a recognised world reference on uranium. Its contents are based on official information received from 45 countries, supplemented by unofficial information for two others. This edition, the 19th, presents the results of a thorough review of world uranium supply and demand as of 1 January 2001 and provides a statistical profile of the world uranium industry in the areas of exploration, resource estimates, production and reactor-related requirements. It provides substantial new information from all major uranium production centres in Africa, Australia, Eastern Europe and North America and, for the first time, includes a report on Tajikistan. This edition also features international expert analyses and projections of nuclear generating capacity and reactor-related uranium requirements through 2020.

Radiation protection

ISOE – Information System on Occupational Exposure

Ten Years of Experience

ISBN 92-64-18480-5 – Free on request.

The Information System on Occupational Exposure (ISOE) was created in 1992 to provide a forum for radiation protection experts from both utilities and national regulatory authorities to discuss, promote and co-ordinate international co-operative undertakings in the area of worker protection at nuclear power plants. The ISOE System is jointly managed by the OECD Nuclear Energy Agency (NEA) and the International Atomic Energy Agency (IAEA). This report provides an overview of the experience gained from, and benefits provided by, the ISOE System over the past ten years. Active participation of a large number of utilities in ISOE has contributed to a reduction in occupational exposure at nuclear power plants worldwide.

Occupational Exposures at Nuclear Power Plants

Eleventh Annual Report of the ISOE Programme, 2001

ISBN 92-64-18492-9 – Free on request.

The Eleventh Annual Report of the ISOE Programme summarises achievements made during 2001 and compares annual occupational exposure data. Principal developments in ISOE participating countries are also described.

The Way Forward in Radiological Protection

An Expert Group Report

ISBN 92-64-18489-9 – Free on request.

Virtually all national and international radiation protection regulations and standards are based on the recommendations published by the International Commission on Radiological Protection (ICRP). New recommendations, to replace those issued in 1990, are in the process of being developed for issuance in 2005, and it is in the interest of all NEA member countries to ensure that these recommendations meet the needs of national regulatory organisations and practitioners. Since revisions began at the ICRP in 1999, the NEA Committee on Radiation Protection and Public Health (CRPPH) has been leading discussions regarding what, in the old recommendations, could be improved or changed to make any new recommendations more functional. Based on a preliminary two-year study to identify those areas that should be improved, this report suggests specific improvements that would render the new system easier to understand and apply, and that should be considered for inclusion in the new ICRP recommendations.

Radioactive waste management

The Decommissioning and Dismantling of Nuclear Facilities

Status, Approaches, Challenges

ISBN 92-64-18488-0 – Free on request.

This report, intended for a broad readership, provides a concise overview of the decommissioning and dismantling of nuclear facilities and associated issues in NEA member countries. It draws upon a database of fact sheets produced to a standard format by individual member countries that is accessible online from the NEA website.

Stepwise Decision Making in Finland for the Disposal of Spent Nuclear Fuel

Workshop Proceedings, Turku, Finland, 15-16 November 2001

ISBN 92-64-19941-1 – Price: € 45, US$ 45, £ 28, ¥ 5 250.

On 18 May 2001, the Finnish Parliament ratified the Decision in Principle (DiP) on the final disposal facility for spent nuclear fuel at Olkiluoto, in the municipality of Eurajoki. This followed positive decisions taken earlier by the Municipal Council and the Government. How did these political and societal decisions come about? An NEA workshop held in November 2001 provided the opportunity to present the history leading up to the DiP and to examine future perspectives with an emphasis on stakeholder involvement. The workshop was highly interactive and focused on three main topics: the stepwise decision-making process, stakeholder involvement and confidence building. All relevant stakeholder voices were heard and their viewpoints debated. An account of the individual presentations and the discussions that took place are provided in these proceedings.

Nuclear law

Nuclear Law Bulletin No. 69

Volume 2002/1-2

2002 Subscription (2 issues + supplements) – ISSN 0304-341X - Price: € 75, US$ 80, £ 48, ¥ 9 550.

Supplement to No. 69: Romania, Ukraine

ISBN 92-64-19810-5 – Price : € 20, US$ 20, £ 12, ¥ 2 300.

Nuclear regulation/nuclear safety

Advanced Nuclear Reactor Safety Issues and Research Needs

Workshop Proceedings, Paris, France, 18-20 February 2002

ISBN 92-64-19781-8 – Price: € 75, US$ 65, £ 46, ¥ 8 700.

New nuclear reactor designs are expected to have a higher level of safety than current designs. As part of the efforts to achieve this, important safety issues related to the new designs need to be identified at an early stage, and research required for problem resolution defined. These proceedings bring together the papers presented at the OECD/NEA Workshop on Advanced Nuclear Reactor Safety Issues and Research Needs. Conclusions of the workshop discussions are offered at the end of the book, which will be of particular interest to all those involved in planning and designing the next generation of nuclear reactors.

CSNI Technical Opinion Papers

No. 1: Fire Probabilistic Safety Assessment for Nuclear Power Plants

No. 2: Seismic Probabilistic Safety Assessment for Nuclear Facilities

ISBN 92-64-18490-2 – Free on request.

These technical opinion papers represent the consensus of risk analysts and experts in NEA member countries on the current state of the art in Fire Probabilistic Safety Assessment (PSA) for nuclear power plant design and operation and Seismic PSA for nuclear facilities. The objective is to present clear technical opinions to decision makers in the nuclear community. As such, 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.

Improving Versus Maintaining Nuclear Safety

ISBN 92-64-18493-7 – Free on request.

Based on contributions from members of the NEA Committee on Nuclear Regulatory Activities (CNRA), this publication provides an overview of current nuclear regulatory philosophies and approaches, as well as insights into a selection of public perception issues. This publication's intended audience is primarily nuclear safety regulators, but government authorities, nuclear power plant operators and the general public may also be interested.

The Nuclear Regulatory Challenge of Judging Safety Backfits

ISBN 92-64-18484-8 – Free on request.

The economic pressures of electricity market competition have led nuclear power plant operators to seek ways to increase electricity production and to reduce operating costs at their plants. Corresponding pressures on the regulatory bodies include operator demand to reduce regulatory burdens perceived as unnecessary and general resistance to consider safety backfits sought by the regulator. The purpose of this report is to describe potential situations giving rise to safety backfit questions and to discuss regulatory approaches for judging the backfits. The intended audience for this report is primarily nuclear regulators, although the information and ideas may also be of interest to nuclear operating organisations, other industry organisations and the general public.

Nuclear science and the Data Bank

Advanced Reactors with Innovative Fuels

Workshop Proceedings, Chester, United Kingdom, 22-24 October 2001

ISBN 92-64-19847-4 – Price: € 130, US$ 113, £ 79, ¥ 15 000.

At this workshop, information on R&D activities for advanced reactor systems was exchanged and research areas in which international co-operation could be strengthened were identified, in particular the roles that could be played by existing experimental facilities and the possible needs for new infrastructure.

Physics of Plutonium Recycling

Volume VI: Multiple Plutonium Recycling in Advanced PWRs

ISBN 92-64-19957-8 – Price: € 45, US$ 45, £ 28, ¥ 5 250.

Although the recycling of plutonium as thermal mixed-oxide (MOX) fuel in pressurised water reactors (PWRs) is now well-established on a commercial scale, many physics questions remain. The main question addressed in this report is the number of times plutonium can effectively be recycled in a PWR. This report describes in particular an exercise based on a realistic, multiple-recycle scenario, which followed plutonium through five generations of recycling in a PWR. It considered both a standard PWR design currently in use and a highly moderated design. The latter is a possible option for a dedicated, MOX-fuelled PWR in which it would be possible to optimise the moderation for plutonium. The study of these two designs in parallel has provided a better understanding of their relative merits, as well as insight into the limitations of multiple recycling and the long-term toxicity of fission products and actinides.

Speciation, Techniques and Facilities for Radioactive Materials at Synchrotron Light Sources

Workshop Proceedings, Grenoble, France, 10-12 September 2000

ISBN 92-64-18485-6 – Free on request.

This NEA Workshop and Euroconference was the second in a series devoted to the application of synchrotron-based techniques to radionuclide and actinide sciences. The unique properties of synchrotron radiation allow one to obtain information about the molecular structure of radionuclides and actinide species, which is essential for understanding and predicting the behaviour of these hazardous elements in the environment. Application areas include risk assessment of nuclear waste storage, remediation of contaminated sites, and development of effective separation technologies, as well as radiopharmaceutical chemistry. These proceedings contain the abstracts and some of the full papers presented at the meeting. In addition to presenting the latest experimental and theoretical results, the meeting was aimed at providing opportunities for learning and scientific discussions between experts in the field and young scientists.

The Use of Thermodynamic Databases in Performance Assessment

Workshop Proceedings, Barcelona, Spain, 29-30 May 2001

ISBN 92-64-19846-6 – Price: € 55, US$ 50, £ 34, ¥ 6 350.

Performance assessment of repository concepts for the geological disposal of long-lived radioactive waste relies on the availability of thermodynamic data for many radionuclides and other elements under a wide range of physico-chemical conditions. For the past ten years, the OECD Nuclear Energy Agency (NEA) has been co-ordinating a multinational effort to produce a database of selected thermochemical values that would satisfy the requirements of the various national programmes in member countries. This project is known as the NEA Thermochemical Database (TDB) Project. This publication contains the full papers and summary discussion records of a workshop attended by scientists active in the field of chemical thermodynamics and experts in repository performance assessment who use the thermochemical databases for their evaluations. During the workshop, participants discussed current experimental and theoretical standpoints, new data requirements and the peculiarities of their application in performance assessment.

A VVER-1000 LEU and MOX Assembly Computational Benchmark

Specification and Results

ISBN 92-64-18491-0 – Free on request.

The United States and the Russian Federation have each agreed to dispose of 34 tonnes of weapons-grade plutonium that are in surplus of their defence needs. One effective way to do this is to convert the plutonium into mixed-oxide (MOX) fuel, burn it in a nuclear reactor and produce electricity with it. The Russian Federation intends to use this MOX fuel in both fast (BN-600) and light water (VVER-1000) reactors. This report describes a benchmark study that compared the results obtained for low-enriched uranium (LEU) and MOX fuel in a VVER-1000. It contributes to the computer code certification process and to the verification of calculation methods used in the Russian Federation.

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