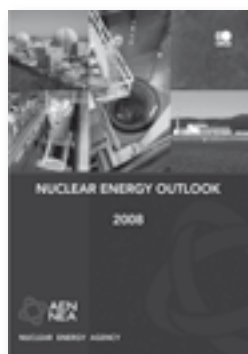


New publications

Economic and technical aspects of the nuclear fuel cycle

Nuclear Energy Outlook (NEO)

ISBN 978-92-64-05410-3. 460 pages. Price: € 105, US\$ 161, £ 81, ¥ 16 800.



This *Nuclear Energy Outlook* (NEO) is the first of its kind and responds to the renewed interest in nuclear energy by many OECD member countries. World energy demand continues to grow unabated and is leading to very serious concerns about security of supply, soaring energy prices and climate change stemming from fossil fuel consumption. Nuclear energy is being increasingly seen as having a role to play in addressing these concerns. This Outlook uses the most current data and statistics available and provides projections up to 2050 to consider growth scenarios and potential implications on the future use of nuclear energy. It also offers unique analyses and recommendations on the possible challenges that lie ahead. Topics covered by the NEO include nuclear power's current status and projected trends, environmental impacts, uranium resources and security of supply, costs, safety and regulation, radioactive waste management and decommissioning, non-proliferation and security, legal frameworks, infrastructure, stakeholder engagement, advanced reactors and advanced fuel cycles.

Market Competition in the Nuclear Industry

ISBN 978-92-64-05406-6. 124 pages. Price: € 39, US\$ 60, £ 30, ¥ 6 200.

Nuclear power plants require a wide variety of specialised equipment, materials and services for their construction, operation and fuelling. There has been much consolidation and retrenchment in the nuclear industry since the 1980s, with the emergence of some large global nuclear companies. Electricity market liberalisation in many OECD countries has meanwhile placed nuclear plant operators under increased competitive pressure. These structural changes in both the producer and consumer sides of the nuclear industry have had implications for the level of competition in the nuclear engineering and fuel cycle markets. With renewed expansion of nuclear power now anticipated, this study examines competition in the major nuclear industry sectors at present, and how this may change with a significant upturn in demand.

Nuclear Energy Data 2008/Données sur l'énergie nucléaire 2008

ISBN 978-92-64-04796-9. 116 pages. Price: € 30, US\$ 46, £ 21, ¥ 4 100.

This new edition of *Nuclear Energy Data*, the OECD Nuclear Energy Agency's annual compilation of essential statistics on nuclear energy in OECD countries, provides information on the latest plans for new nuclear construction, nuclear fuel cycle developments and projections of installed nuclear capacity to 2030 in member countries. This comprehensive overview of the current situation and expected trends in various sectors of the nuclear fuel cycle is an authoritative reference for policy makers, experts and academics working in the nuclear energy field.

Timing of High-level Waste Disposal

ISBN 978-92-64-04625-2. 132 pages. Price: € 45, US\$ 69, £ 32, ¥ 6 200.

This study identifies key factors influencing the timing of high-level waste (HLW) disposal and examines how social acceptability, technical soundness, environmental responsibility and economic feasibility impact on national strategies for HLW management and disposal. Based on case study analyses, it also presents the strategic approaches adopted in a number of national policies to address public concerns and civil society requirements regarding long-term stewardship of high-level radioactive waste. The findings and conclusions of the study confirm the importance of informing all stakeholders and involving them in the decision-making process in order to implement HLW disposal strategies successfully. This study will be of considerable interest to nuclear energy policy makers and analysts as well as to experts in the area of radioactive waste management and disposal.

Uranium 2007: Resources, Production and Demand

ISBN 978-92-64-04766-2. 420 pages. Price: € 120, US\$ 186, £ 86, ¥ 16 600.

With several countries building nuclear power plants and many more considering the use of nuclear power to produce electricity in order to meet rising demand, the uranium industry has become the focus of considerable attention. In response to rising demand and declining inventories, uranium prices have increased dramatically in recent years. As a result, the uranium industry is undergoing a significant revival, bringing to an end a period of over 20 years of underinvestment. The "Red Book", jointly prepared by the OECD Nuclear Energy Agency and the International Atomic Energy Agency, is a recognised world reference on uranium. It is based on official information received from 40 countries. This 22nd edition provides a comprehensive review of world uranium supply and demand as of 1st January 2007, as well as data on global uranium exploration, resources, production and reactor-related requirements. It provides substantive new information from major uranium production centres in Africa, Australia, Central Asia, Eastern Europe and North America. Projections of nuclear generating capacity and reactor-related uranium requirements through 2030 are also featured, along with an analysis of long-term uranium supply and demand issues.

Nuclear safety and regulation

CSNI Collective Statement on Support Facilities for Existing and Advanced Reactors

The Function of OECD/NEA Joint Projects - NEA Committee on the Safety of Nuclear Installations (CSNI)

ISBN 978-92-64-99052-4. 16 pages. Free: paper or web.

The NEA Committee on the Safety of Nuclear Installations (CSNI) has recently completed a study on the availability and utilisation of facilities supporting safety studies for current and advanced nuclear power reactors. The study showed that significant steps had been undertaken in the past several years in support of safety test facilities, mainly by conducting multinational joint projects centred on the capability of unique test facilities worldwide. Given the positive experience of the safety research projects, it has been recommended that efforts be made to prioritise technical issues associated with advanced (Generation IV) reactor designs and to develop options on how to efficiently obtain the necessary data through internationally co-ordinated research, preparing a gradual extension of safety research beyond the needs set by currently operating reactors. This statement constitutes a reference for future CSNI activities and for safety authorities, R&D centres and industry for internationally co-ordinated research initiatives in the nuclear safety research area.

The Regulatory Goal of Assuring Nuclear Safety

ISBN 978-92-64-99044-9. 56 pages. Free: paper or web.

The fundamental objective of all nuclear safety regulatory bodies is to ensure that nuclear facilities are operated, as well as decommissioned, in an acceptably safe manner. However, in meeting this objective the regulator must keep in mind that it is the operator that has responsibility for safely operating a nuclear facility; the role of the regulator is to oversee the operator's activities as related to assuming that responsibility. There are currently many sources of information available to the regulator pertaining to safety at any given nuclear facility, such as inspection reports,

operating experience reports, research results, periodic safety reviews, probabilistic safety analysis (PSA) results, insights from IAEA reviews and other similar information. A major challenge for the regulator is to systematically collect and analyse this information in order to arrive at an integrated assessment of the level of safety of the particular facility and then to make a judgement about its acceptability. In order to assist member countries in addressing this challenging question, the NEA Committee on Nuclear Regulatory Activities (CNRA) has sponsored this report. The primary focus of the report is on how the regulatory body can systematically collect and make an integrated analysis of all the relevant safety information available to it and arrive at a sound judgement on the acceptability of the level of safety of the facilities that it regulates. It therefore follows that the target audience for this report is primarily nuclear regulators, although the information and ideas may also be of interest to nuclear operators, other nuclear industry organisations and segments of civil society.

The Role of Research in a Regulatory Context (RRRC-2)

Workshop Proceedings, Paris, France, 5 December 2007

ISBN 978-92-64-99045-6. 136 pages. Free: paper or web.

This workshop enabled the exchange of experience among regulators, research managers and industry on the needs, priorities and foreseeable trends for nuclear safety research in a regulatory context. It also addressed the means that are or can be used for effectively performing such research. The presentations highlighted priority safety issues, at present and in the near term, for operating plants and new reactors. During the workshop, participants discussed the challenges that the nuclear community will face in the long term for performing safety evaluations of advanced reactor designs, and explored various avenues for organising the research and infrastructure that will be needed. These proceedings will be of particular interest to nuclear specialists and research managers wishing to obtain an international perspective of current and foreseeable needs in regulatory-driven nuclear safety research.

Radiological protection

A Stakeholder Dialogue on the Implications of the ICRP Recommendations

Summary of the Three NEA/ICRP Conferences

ISBN 978-92-64-99033-3. 44 pages. Free: paper or web.

Since its inception the NEA Committee on Radiation Protection and Public Health (CRPPH) has been involved in the assessment and implementation of the recommendations of the International Commission on Radiological Protection (ICRP). The development of new general ICRP recommendations, to replace those of the 1990 ICRP Publication 60, was thus of great interest to the NEA and its member countries. As a result, the NEA initiated a process of interaction and dialogue with the ICRP to ensure that the views and concerns of NEA member countries could be voiced and appropriately addressed in the new ICRP recommendations. The new ICRP recommendations were approved by the ICRP Main Commission in March 2007, by which point the NEA had sponsored 7 international conferences and produced 13 publications on the subject. This report is the summary of the three international dialogue conferences (held in Tokyo, 5-6 July 2006, Washington, DC, 28-29 August 2006, and Prague, 24-25 October 2006) that were organised to provide the ICRP with feedback regarding the June 2006 draft of its new recommendations. It includes a presentation of the key points of the draft recommendations, a summary of the suggestions made during the three conferences, and an assessment of the significant evolution that has been seen in the ICRP's presentation of its draft recommendations over the course of the conference series.

Occupational Exposures at Nuclear Power Plants

Sixteenth Annual Report of the ISOE Programme, 2006

ISBN 978-92-64-99042-5. 120 pages. Free: paper or web.

The Information System on Occupational Exposure (ISOE) was created by the OECD Nuclear Energy Agency in 1992 to promote and co-ordinate international co-operative undertakings in the area of worker protection at nuclear power plants. ISOE provides experts in occupational radiological protection with a forum for communication and exchange of experience. A total of 71 utilities in 29 countries participate in the programme as well as the

regulatory authorities of 25 countries. The ISOE databases enable the analysis of occupational exposure data from 401 operating commercial nuclear power plants (representing about 91% of the world's total operating commercial reactors), as well as 80 units undergoing decommissioning. The Sixteenth Annual Report of the ISOE programme summarises achievements made during 2006 and compares annual occupational exposure data. Principal developments in ISOE participating countries are also described.

Radioactive waste management

Moving Forward with Geological Disposal of Radioactive Waste

A Collective Statement by the NEA Radioactive Waste Management Committee (RWMC)

ISBN 978-92-64-99057-9. 24 pages. Free: paper or web.

The NEA Radioactive Waste Management Committee (RWMC) has underscored the environmental and ethical basis for geological disposal as well as its technical feasibility in a number of previous collective statements. In the intervening period there have been advances and evolving views regarding the appropriate methodologies, policies and decision-making processes. In addition, much further practical experience has accumulated regarding the development of geological repositories. In the statement the RWMC expresses, in a concise form, its collective views on why geological disposal remains an appropriate waste management choice for the disposal of the most hazardous and long-lived radioactive wastes, on the current status of geological disposal, on challenges and opportunities for implementation, and expectations for further developments.

Regulating the Long-term Safety of Geological Disposal

Towards a Common Understanding of the Main Objectives and Bases of Safety Criteria

ISBN 978-92-64-99031-9. 84 pages. Free: paper or web.

Regulating the long-term safety of geological disposal of radioactive waste poses special challenges due to the very long timescales involved. This report has been prepared to help foster a common understanding of the fundamental safety objectives of deep geological repositories and the applicable criteria. It provides important guidance for the national programmes that are developing or refining regulations. A common understanding may also contribute to clearer communication and public understanding of regulatory criteria.

Safety Cases for Deep Geological Disposal of Radioactive Waste: Where Do We Stand?

Symposium Proceedings, Paris, France, 23-25 January 2007

ISBN 978-92-64-99050-0. 424 pages. Free: paper or web.

The OECD Nuclear Energy Agency (NEA) hosted an international symposium on "Safety Cases for the Deep Disposal of Radioactive Waste: Where Do We Stand?" in January 2007. The NEA has spearheaded important developments in defining, and in developing methodologies to support, demonstrations of safety for deep disposal, including a similar symposium nearly two decades ago that provided the basis for a 1991 NEA collective opinion that the technical basis and methods exist for undertaking safety assessment of deep geological disposal. The 2007 symposium, co-sponsored by the European Commission and the International Atomic Energy Agency, provided the opportunity to review progress and to identify emerging trends and challenges. It brought together experts in the field of radioactive waste disposal from waste management organisations, regulatory agencies, scientific support organisations, international agencies, private sector consultants, and public interest groups both within and beyond NEA member countries.

The symposium showed that safety cases for radioactive waste disposal have evolved to become important tools both to assess safety and to aid in decision making. There is a good, shared understanding of what a safety case is and what comprises its main components. Importantly, the concept of a safety case today encompasses not only quantitative assessments of potential repository performance but also includes additional (and often

more qualitative) lines of evidence and arguments that can contribute to confidence in safety. There has been significant evolution in terms of the analytical tools, lines of evidence, range of performance indicators and communication of the safety case. The value of international co-operation and dialogue in developing the concept and methodology of safety cases was underscored. These proceedings describe the discussions and conclusions of the symposium, and provide copies of the technical papers presented.

Nuclear law

Nuclear Law Bulletin

ISSN 0304-341X. 2009 subscription: € 114, US\$ 150, £ 79, ¥ 16 500.

Considered to be the standard reference work for both professional and academics in the field of nuclear law, the *Nuclear Law Bulletin* is a unique international publication providing its subscribers with up-to-date information on all major developments falling within the domain of nuclear law. Published twice a year, 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.

Nuclear science and the Data Bank

Analytical Benchmarks for Nuclear Engineering Applications

Case Studies in Neutron Transport Theory

ISBN 978-92-64-99056-2. 296 pages. Free: paper or web.

Preservation of know-how in the nuclear field is promoted through the activities of the OECD Nuclear Energy Agency Data Bank. One area of importance concerns methods for solving radiation transport problems, especially with regard to neutrons. This handbook (in the form of a case study), prepared by Barry D. Ganapol, is the result of such an initiative. It is a compilation of solutions to the transport equation for which analytical representations can be found. It is designed for educational use in courses on analytical transport methods and numerical methods with application to reactor physics. In addition, it contains elements for the continuous improvement of transport methods and for computer code verification. The areas of neutron slowing down, thermalisation and one-, two- and three-dimensional neutron transport theory are covered. A series of training courses, based on this compilation of solutions, has recently begun.

Burn-up Credit Criticality Benchmark

Phase II-C: Impact of the Asymmetry of PWR Axial Burn-up Profiles on the End Effect

ISBN 978-92-64-99049-4. 512 pages. Free: paper or web.

Since 1991, the NEA has conducted a number of scientific studies to examine nuclear fuel burn-up issues as applied to criticality safety in the transport, storage and treatment of spent fuel. They have covered a wide range of fuel types, including UOX and MOX fuels for PWR, BWR and VVER reactors. The objective of the current study was to examine the axial burn-up profiles of PWR UO₂ spent fuel assemblies and specifically the fuel assembly end effects and the axial fission density distributions. The study was based on the evaluation of a database of experimentally measured axial burn-up profiles of the Siemens Convoy fuel assemblies, irradiated in the German nuclear power plant Neckarwestheim II. The report analyses and summarises the solutions to the specified benchmark exercises provided by ten contributors from seven countries. It shows that there is a

significant correlation between the asymmetry of axial fuel assembly burn-up profiles and both the end effect and the axial fission density distribution. The results also illustrate the importance of using accurate axial fuel burn-up profiles when designing transport/storage fuel casks.

International Evaluation Co-operation

Uncertainty and Target Accuracy Assessment for Innovative Systems Using Recent Covariance Data Evaluations (Volume 26)

ISBN 978-92-64-99053-1. 196 pages. Free: paper with CD-Rom or web.

This publication reports the conclusions from the work undertaken by Subgroup 26 of the NEA Working Party on International Nuclear Data Evaluation Co-operation (WPEC), which focused on the development of a systematic approach to define data needs for advanced reactor systems and to make a comprehensive study of such needs for Generation IV (Gen-IV) reactors. A comprehensive sensitivity and uncertainty study has been performed to evaluate the impact of neutron cross-section uncertainty on the most significant integral parameters related to the core and fuel cycle of a wide range of innovative systems. A compilation of preliminary "Design Target Accuracies" has been put together and a target accuracy assessment has been performed to provide an indicative quantitative evaluation of nuclear data improvement requirements by isotope, nuclear reaction and energy range, in order to meet the design target accuracies, as compiled in the present study. First priorities were formulated on the basis of common needs for fast reactors and, separately, thermal systems.

Structural Materials for Innovative Nuclear Systems (SMINS)

Workshop Proceedings, Karlsruhe, Germany, 4-6 June 2007

ISBN 978-92-64-04806-5. 544 pages. Price: € 110, US\$ 170, £ 79, ¥ 15 200.

Structural materials research is a field of growing relevance in the nuclear sector, especially for the different innovative reactor systems being developed within the Generation IV International Forum (GIF), for critical and subcritical transmutation systems, and of interest to the Global Nuclear Energy Partnership (GNEP). Under the auspices of the NEA Nuclear Science Committee (NSC) the Workshop on Structural Materials for Innovative Nuclear Systems (SMINS) was organised in collaboration with the *Forschungszentrum Karlsruhe* in Germany. The objectives of the workshop were to exchange information on structural materials research issues and to discuss ongoing programmes, both experimental and in the field of advanced modelling. These proceedings include the papers and the poster session materials presented at the workshop, representing the international state of the art in this domain.

Utilisation and Reliability of High Power Proton Accelerators (HPPA5)

Workshop Proceedings, Mol, Belgium, 6-9 May 2007

ISBN 978-92-64-04478-4. 456 pages. Price: € 100, US\$ 140, £ 72, ¥ 13 900.

The accelerator-driven system (ADS) is one of the viable concepts for transmuting the long-lived isotopes contained in spent nuclear fuel and for this reason has been receiving considerable interest. In turn, attention must be given to the high power proton accelerators whose reliability and performance are key to the functioning of the ADS. It is in this context that the NEA organised the fifth workshop on the Utilisation and Reliability of High Power Proton Accelerators (HPPA5) which was held on 6-9 May 2007 in Mol, Belgium. The workshop included a special session on the MEGAPIE programme as well as five technical sessions: accelerator programmes and applications; accelerator reliability; spallation target development and coolant technology; subcritical system design and ADS simulations; and ADS experiments and test facilities. These proceedings contain all the technical papers presented at the workshop and will be of particular interest to scientists working on ADS development.