

The Safety Case: Current Issues and Work Programme of the IGSC

IGSC activities build the scientific and technical basis to evaluate, substantiate and review the safety of deep geological disposal. IGSC projects address issues related to, for example:

• Fundamental aspects of safety cases

- Nature and purpose of the safety case;
- Consideration of timescales in post-closure safety of geological disposal;
- Establishing and communicating confidence in safety.

• Technical issues in the design, study, and evaluation of disposal systems

- Advances in safety assessment methods;
- Features, events and processes that can affect disposal system performance
- Practical issues for collecting

and integrating geological information in safety cases;

- Stability of the geosphere for long-term isolation of waste;
- Engineered barrier systems from design to modelling to feasibility demonstration;
- Feedback between site characterisation, safety assessment, and repository design;
- The solubility and transport of radionuclides.

• Practical challenges in implementing waste repositories

- Balancing operational safety and long-term safety considerations;
- Long-term safety implications of reversibility and retrievability in repositories;
- Organisational aspects and knowledge management in safety case development and results.

These activities enable IGSC to:

- Define the essential elements of a safety case
- Identify best practices to assess safety
- Share national experience and progress in documenting and reviewing safety cases
- Advance the understanding of natural and engineered components and their performance
- Develop databases and information tools
- Identify emerging trends and issues. ■

IGSC Publications

IGSC reports and publications are available on the NEA web site at www.nea.fr/html/pub. Recent publications include:

- The INTESC (INTErnational Experience in Developing Safety Cases) Project: Report on the State of the Art, 2009.
- Approaches and Challenges for the Use of Geological Information in the Safety Case (Workshop Proceedings), 2009.
- Stability and Buffering Capacity of the Geosphere for Long-term Isolation of Radioactive Waste: Application to Crystalline Rock (Workshop Proceedings), 2009.
- Safety Cases for Deep Geological Disposal of Radioactive Waste: Where Do We Stand?, Proceedings of an International Symposium, 2008.
- Consideration of Timescales in Post-closure Safety of Geological Disposal, 2008.
- Engineered Barrier Systems in the Safety Case: Design Confirmation and Demonstration (EBS-4 Workshop Proceedings), 2007.

For more information on IGSC activities, visit our web page at: www.nea.fr/html/rwm/igsc.html



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MANAGING RADIOACTIVE WASTE FOR THE LONG TERM

IGSC

Integration Group
for the Safety Case

AN INTERNATIONAL GROUP OF
THE NUCLEAR ENERGY AGENCY (NEA)
A SPECIALISED AGENCY OF
THE ORGANISATION FOR ECONOMIC
CO-OPERATION AND DEVELOPMENT (OECD)



WE OWE IT TO OURSELVES AND FUTURE GENERATIONS TO MANAGE RADIOACTIVE WASTE IN A SAFE AND ENVIRONMENTALLY RESPONSIBLE MANNER, WITH AGREEMENT FOSTERED THROUGH SOCIETAL DIALOGUE. SUPPORT FOR SUSTAINABLE SOLUTIONS RESTS ON CONFIDENCE THAT DISPOSAL IS TECHNOLOGICALLY SOUND AND THAT SAFETY CAN BE CONVINCINGLY DEMONSTRATED.

Geological disposal and the safety case

Radioactive waste is produced in all phases of the nuclear fuel cycle and with the use of radioactive materials in industrial, medical, defence and research applications. The most hazardous and long-lived radioactive wastes, such as spent nuclear fuel and high-level waste from fuel reprocessing, must be contained and isolated for thousands of years. Disposal of these wastes in engineered facilities, or repositories, located deep underground in suitable geological formations is being developed worldwide as the reference solution. The concept of a **geological repository takes advantage of the capabilities of both the local geology as well as repository design and engineered materials** to manage waste safely far into the future. Societal agreement for deep geological repositories depends on

confidence that they can protect humans and the environment both now and in the future. **The safety of a repository is evaluated and documented in a "safety case"** that supports decision making at each stage of repository development. It presents the underlying evidence and methods that give confidence in the quality of scientific and institutional processes as well as in the results of analyses.

IGSC Mission

The Integration Group for the Safety Case (IGSC) builds and documents the technical and scientific basis for developing and reviewing safety cases as a platform for dialogue amongst technical experts and as a tool for decision making. The IGSC is the technical advisory body to the Radioactive Waste Management Committee, which addresses strategic and policy aspects of radioactive waste management. For more than two decades,

the IGSC and its predecessor technical groups have promoted the **exchange of national experience** in evaluating and implementing geological repositories. IGSC activities foster **consensus on best practices** and encourage the **development of innovative, advanced approaches** covering technical aspects at all stages of repository implementation, including:

- › strategies to characterise and evaluate potential disposal sites;
 - › methods to design and test engineered barrier systems;
 - › priorities for research and development programmes to improve the understanding of important processes and interactions;
 - › tools for safety assessment;
 - › techniques for effective presentation and communication of the results of safety cases, and other factors that contribute to confidence in safety.
- The IGSC was instrumental in defining the concept and elements of a "safety case" for geological disposal.

IGSC Membership and Operation

The IGSC comprises **senior technical specialists and managers** from national waste management programmes.

The strength of the IGSC derives from the **diversity of affiliations, sensitivities and expertise** of its members. The preparation of a safety case involves many disciplines including engineering, geology, chemistry, radiation protection and computer modelling. The IGSC has members from all these disciplines. They are drawn from a wide range of organisations, including waste management agencies, regulatory authorities, technical support organisations, and research and development institutions. The group currently has 46 members from 38 organisations in 17 countries. The European Commission is also a member, and the International Atomic Energy Agency (IAEA) participates as an

observer.

The IGSC thus provides an open, neutral forum for dialogue among experts from a wide range of organisations in numerous countries. The IGSC accomplishes its work through a variety of mechanisms including:

- › annual **plenary meetings** with in-depth discussion of emerging issues and trends;
 - › technical **workshops** to explore key topics in detail;
 - › **studies** and joint projects that are backed by the collective expertise of the participating organisations.
- The IGSC also supports the Radioactive Waste Management Committee in performing timely and authoritative peer review of member programmes in the area of assessing long-term safety. All these activities typically involve the broader scientific and academic communities.

The outcomes of IGSC projects are documented in technical reports and fact sheets that are publicly available.

The IGSC cooperates with its counterparts in the European Commission and IAEA to ensure consistency in international consensus on scientific issues related to geological disposal. The IGSC recognises that implementing waste disposal requires more than technical competence. It is necessary to build confidence in safety and to achieve societal agreement for disposal strategies. The IGSC coordinates with other NEA committees and working parties on radioactive waste to **integrate multidisciplinary aspects of waste disposal programmes:** legal, regulatory, and societal aspects, as they relate to technical issues. ■

