



International Workshop on the Development and Application of a Safety Case for Dual Purpose Casks for Spent Nuclear Fuel

**IAEA Headquarters
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**Chair: Bernhard Droste
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Terms of Reference

A. Background

The management of spent fuel from nuclear power reactors is an important issue. A majority of countries have yet to decide on the final destination of spent fuel, although some are already developing their final disposal facilities. All along this process, however, the storage period of spent fuel is de facto increasing. As a result, many Member States are in need of additional storage capacity for spent nuclear fuel.

One of the widely accepted options for additional storage capacity is the use of dry spent fuel storage casks. From among various existing dry storage concepts, dual purpose casks (DPCs) have been utilized in several Member States.

A DPC is a cask that is designed for both transportation and storage of spent nuclear fuel. Management of spent fuel using a DPC involves both storage of spent fuel and its transport before and after storage. That means, in practice, that the DPC needs to comply with both storage and transport regulations. Therefore, it is important to develop a safety case for the DPC system for the purpose of demonstrating its safety by integrating and presenting all the arguments and evidence for both storage and transport applications. It is also important to update the safety case during the whole life cycle of a DPC in order to account for ageing, regulatory changes, evolution of technologies, and any other relevant information related to the safety of storage and transport of the spent fuel in the DPC.

In order to provide guidance to Member States for developing an integrated safety case for storage and transport in a holistic manner, the IAEA established in 2011 the Joint Working Group on Guidance for an Integrated Transport and Storage Safety Case for Dual Purpose Casks for Spent Nuclear Fuel. This three-year project has clarified many important issues related to the safe management of DPCs. The results of the Working Group's activities have been consolidated in a document with the provisional title *Guidance for preparation of a safety case for a dual purpose cask containing spent fuel*¹, which is expected to be published as part of the IAEA Technical Documents series. In addition, the Working Group provided recommendations¹ for revisions to be made to existing relevant IAEA safety standards. The Working Group's activities enhanced the overall understanding of the concept of an integrated safety case for DPCs. However, it is also recognized that there is a gap between the current practices within Member States and the proposed concept.

B. Objectives and Scope

The IAEA is conducting this workshop in order to enhance the participants' understanding of the proposed concept of an integrated safety case for DPCs, to analyse the gap between the current practices within Member States and the proposed concept, and to discuss ways of further improving the application of this concept.

¹ The draft text and the recommendations to the IAEA Safety Standards Committees can be downloaded from: <http://www-ns.iaea.org/tech-areas/waste-safety/spent-fuel-casks-wg.asp?s=3>.

The scope of the workshop includes exchanging and sharing information, and collecting feedback from Member States on:

- Development of a regulatory framework for DPCs
- Experience in development of safety cases for DPCs
- Operating experience related to DPCs and DPC storage facilities
- Ageing management of DPCs
- Interface issues between transport and storage of DPCs
- Application of the above-mentioned draft IAEA Technical Document

The workshop will also analyse and highlight the needs of Member States regarding future IAEA programmes to support the development and application of an integrated safety case concept for DPCs. Presentations need not be limited only to metallic casks; on the contrary, participants are encouraged also to consider different types of DPCs or canister systems, including multi-purpose canister (MPC) systems, in order to facilitate discussions on future IAEA programmes in this area.

C. Expected Outcomes

The following outcomes are expected as a result of information exchange and discussion throughout the workshop:

- Information on the regulatory frameworks and practices related to the application of DPC safety cases;
- Understanding of the concept of an integrated safety case, safety assessment methodologies, and management system aspects;
- Feedback on the draft IAEA Technical Document with the provisional title *Guidance for preparation of a safety case for a dual purpose cask containing spent fuel*;
- Input to achieve further harmonization and improvements to the concept of an integrated safety case for DPCs; and
- Input for preparing future IAEA programmes to support Member States to develop and apply the integrated safety case concept to other applications, such as canister systems, metal–concrete type cask systems, and MPC systems.

D. Audience

The target audience for the workshop comprises government officials, experts from technical institutions, and industry representatives involved in spent fuel management, specifically the following professional groups: regulators, nuclear power plant operators, storage facility designers and operators, transport operators, cask designers and manufacturers, and technical experts involved in these activities.

E. Programme

The workshop will have an opening session to provide background information, including presentations on the draft IAEA Technical Document with the provisional title *Guidance for preparation of a safety case for a dual purpose cask containing spent fuel*.

There will be technical sessions addressing the legal and regulatory framework, licensing, experience of designing casks and storage facilities, and operational experience, in relation to the development and application of an integrated safety case for DPCs.

In addition, working groups or panel sessions will be organized in order to facilitate extensive exchange of views among participants. The topics to be discussed during these sessions include:

- Concept of integrated safety case for DPCs (What does such a safety case involve? / Who develops and maintains the safety case? / How is the safety case applied to various activities throughout the life cycle of a DPC?)
- Application of different safety case concepts in Member States
- Analysis of the gap between current practices within Member States and the proposed integrated safety case concept
- Harmonization of transport package design certification and storage licenses
- Feedback on the draft IAEA Technical Document on the safety case for a DPC
- Development of generic test conditions during on-site transport and storage: Needs and the way forward
- Application of the integrated safety case concept to other applications such as canister systems, MPCs, DPCs for high level waste (vitrified waste) or other waste forms
- Proposals for future IAEA programmes to support Member States in developing and applying the integrated safety case concept in other areas
- Follow-up on the Working Group's recommendations for revisions to be made to existing relevant IAEA safety standards

F. Presentations

Participants from Member States who wish to give an oral presentation are requested to submit an abstract that describes the key points of their presentation. The abstract should be submitted electronically to both the IAEA co-Scientific Secretary and the Administrative Secretary for the workshop, Ms Yumiko Kumano and Ms Kristina Nussbaum, at: Y.Kumano@iaea.org and K.Nussbaum@iaea.org by **28 February 2014**. The final agenda for the workshop will be sent electronically to participants before the workshop. The presenters are requested to send the complete versions of their presentations to: Y.Kumano@iaea.org and K.Nussbaum@iaea.org by **15 May 2014**.

G. Meeting arrangements

The Scientific Secretaries of the workshop are:

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ANNEX:

Examples of topics to be discussed at the workshop

This annex presents a list of topics suggested for presentations.

1. Legal and regulatory framework
 - a. Regulatory framework for dual purpose cask (DPC) design approval and certificate renewal (interface between nuclear power plant licensing, transport licensing, and storage facility licensing)
 - b. Specific requirements for DPC design and operation, and their safety assessment
 - c. Harmonization and integration of transport and storage licensing
 - d. Consideration of regulatory changes
 - e. Experience related to the safety review of a DPC safety case
 - f. Requirements for monitoring and periodic inspections during operation of the storage facility
 - g. Requirements for ageing management
 - h. Requirements for periodic safety reviews, gap analysis, and design modifications
 - i. Requirements for a management system

2. Cask designers' experience
 - a. Safety basis for design specifications of DPC or multi-purpose canister components, including spent fuel assemblies (high burnup fuel, mixed oxide fuel, etc.)
 - b. Specific design considerations (Burnup credit, long term safety, water exclusion, damaged fuel, monitoring system, closure system repair concept, etc.)
 - c. Consideration of accident conditions during on-site activities and storage (handling accident, severe accident, etc.)
 - d. Ageing considerations in the context of safety case development
 - e. Management system for cask fabrication, package preparation, and maintenance work during storage and before transport after storage
 - f. Experience related to periodic safety reviews, gap analysis, and design modifications
 - g. Interfaces with spent fuel generators, storage facility designers, storage facility operators, transport operators

3. Storage facility designers' experience

- a. Safety basis for design specifications of storage facilities
- b. Safety basis for determining the acceptance criteria of the DPC
- c. Consideration of accident conditions during handling and storage including natural events, and related requirements for cask design
- d. Design considerations for maintenance and repair of DPC packages
- e. Experience related to periodic safety reviews and design modifications
- f. Interfaces with spent fuel generators, cask designers, storage facility operators, and transport operators

4. Operational experience

- a. Operational experience related to DPC preparation, storage facility operation, and transportation
- b. Verification of DPC acceptance criteria
- c. Management system (interfaces between stakeholders, allocation of responsibilities, record management for spent fuel characterization, DPC, and storage facility conditions)
- d. Ageing management programme
- e. Maintenance and improvement of the safety case
- f. Experience related to periodic safety reviews
- g. Record preservation and knowledge management (technical basis for the safety case, inspection data, operational experience, etc.)
- h. Interfaces between spent fuel generators, storage facility operators, cask designers, and transport operators