

Development and Application of a Safety Case for Dual Purpose Casks

**International Conference on the
Management of Spent Fuel from Nuclear
Power Reactors:
An Integrated Approach to the Back End
of the Fuel Cycle**

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IAEA

International Atomic Energy Agency

Joint WG on Guidance for an Integrated Transport and Storage Safety Case for DPCs for SNF (1)

Background

- Growing amount of SNF in storage caused by delays in decision on SF disposition
 - Necessity of additional storage capacity
 1. Wet storage
 2. Dry storage... Includes DPCs designed for both transport / storage
- Intention is to provide guidance to MSs for integrating safety cases for storage and transport in a holistic manner
 - Establishment of a joint international working group

Objective

1. To provide an IAEA document containing recommendations and guidance for the structure and contents of an Integrated Safety Case for a dual purpose storage and transport cask.
2. Recommendation for changes to be made to existing IAEA documents

Joint WG on Guidance for an Integrated Transport and Storage Safety Case for DPCs for SNF (2)

Scope of the document

- Dual Purpose Casks – Transport / Storage
 - Guideline for establishing integrated safety cases in consideration of the interface issues between storage and transport casks.
- Storage period – 50 years (short term) / 100 years (long term)
 - Specific description with examples for explaining the application of the methodology, including aging assessments
- Mainly for metallic casks, consideration for canisters being added later

Working Group

Chair: B. Droste (BAM, Germany)

SWG leads: M. Hirose (NFT, Japan)

J. Harvey (NDA, UK)

I. Reiche (BfS, Germany)

D. Wolff (BAM, Germany)

Secretary: P. McConnell (SNL, USA)

IAEA: Y. Kumano, K. Varley



Safety Case for DPCs

Major points being discussed

- *How to define acceptance criteria*
- *Ageing consideration for long-term storage and transport after storage*
 - ❖ *Design / Fabrication*
 - ❖ *Operation*
 - ❖ *Retrievability*
 - *Ageing management programme*
- *Licensing consideration*
 - ❖ *Licensing for both storage / transport*
 - ❖ *Licensing renewal (esp. for transport)*
 - ❖ *Change of transport regulations / new technology development*



- *And...*
 - ❖ *Inspections before transport*
 - ❖ *Records during fabrication/ operation*

Joint WG activities

WG activities (2011 – 2013)

- Three Technical meetings to develop technical report and information exchange
Base document: *Technical Guide – Package Design Safety Reports for the Transport of Radioactive Material (PDSAR)*
by European Association of Competent Authorities
- Discussion on Recommendations to WASSC / TRANSSC
- Discussion on Future activities

Outcomes

1. Recommendations to WASSC/TRANSSC
 - Revision of Safety Standards (SSG-15 & GSR Part 6)
→ reported to WASSC / TRANSSC
2. Publication of Technical Document
 - Publication process in progress (to be published as a TECDOC)
3. Follow-up activities
 - WS on the application of SC concept ... May 2014

International Workshop on the Development and Application of a Safety Case for Dual Purpose Casks for Spent Nuclear Fuel (May 2014)

Meeting Chair:

Mr. Bernhard Droste (BAM, Germany)

Participants:

54 participants from 19 Member States + EU

Objectives:

1. to enhance the understanding of the **concept of an integrated safety case**;
2. to **analyse gap** between the current practices and the proposed concept;
3. to **discuss further improvements** of the application of the integrated safety case concept.

Sessions

3 Technical session + 1 Panel session

- ❖ Legal and regulatory framework
- ❖ Design of storage facilities and operational experience
- ❖ Designing casks for dual-purpose operations
- ❖ Discussions on implementation of safety case / future IAEA activities



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Summary of discussions (1)

Major discussions at technical sessions

- Adoption of a DPC strategy involves the provision of **plausible and practical regulatory framework and technical considerations** for long term management of DPCs. This includes **contingency plans** if there is a need to unload the SF or transport from the storage facility
- **SC for DPCs needs to be evolved** during storage and forthcoming transport after storage.
 - cask and storage facility designs that consider
 - monitoring and inspection plans,
 - ageing management,
 - possible changes of storage plans,
 - measures for future incident;
 - R&D programmes to ensure the proposed safety case is robust enough even after long term storage.
- Non-technical concerns - **record keeping & PA** over many decades

Summary of discussions (2)

Major discussions at the panel session

- Discussions on implementation of SC and future activities
 - Some missing contents in draft TECDOC need to be considered in future activities
 - A document providing guidance for developing an **AMP** specifically for DPCs should be developed.
 - Guidance for developing a safety case for spent fuel in **canisters** for storage and transportation.
 - Consideration of **changes in transport regulations** with respect to DPC issues.
 - Keep activities like this Workshop

Recommendations for future IAEA activities (1)

1) A document providing guidance for developing an AMP specifically for DPCs should be developed.

- Experience compendium
- Lessons learned, design changes towards inspection for ageing management
- AMP for records management and ageing management for regulatory changes and technological advances
- Maintenance of the Safety Case during the storage period
- Examples of safety-related components requiring reference within an AMP:
 - Seals / bolts
 - Shielding
 - Absorber materials

Recommendations for future IAEA activities (2)

2) Develop guidance for a methodology to develop acceptance criteria for storage and on-site transport including generic storage accident conditions

3) Information exchanges by relevant IAEA activities to discuss application of information in the TECDOC related to:

a) Transport and storage of damaged fuel

b) DPCs for high-level waste

c) Guidance for developing a Safety Case for spent fuel in canisters for storage and transportation

d) Multi-purpose containers to include use for disposal

CRP AMPs for SF Dry Storage Systems



- In response to recommendations made at the International Workshop on the Development and Application of a Safety Case for Dual Purpose Casks for Spent Nuclear Fuel (May 2014)
- NFC&MS in co-operation with NSRW plan to initiate a CRP in 2016 on ageing management programmes for spent fuel dry storage systems.
- Overall Objective
 - To develop the technical basis and methodology to enable guidance to be provided to Member States on how to generate an ageing management programme for spent fuel dry storage systems



[Visit our DPC WG webpage](http://www-ns.iaea.org/tech-areas/waste-safety/spent-fuel-casks-wg.asp?s=3)
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