Report on TM-40975
1st Meeting of:

Joint Working Group for an Integrated Transport and Storage Safety Case for Dual Purpose Casks for Spent Nuclear Fuel

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„Dual Purpose“

Dry Spent Fuel Transport and Storage Casks

**Main Cask Design Criteria**
- Nuclear safety (subcriticality)
- Radiation protection (shielding)
- Passive decay heat removal
- Safe containment (Cask integrity, leak tightness)
- Long-term cask durability

CASTOR V/19 casks (GNS) in interim storage facilities
Differences between Transport Package and Storage Cask

....to be considered in their Safety Cases

Transport package:
- Impact limiters at bottom and lid side, in some designs also circumferentially
- One lid as containment component
- Horizontal position, under canopy
- TS-R-1 accident conditions of transport

Storage cask:
- No impact limiters (on the cask)
- Secondary lid with monitoring
- Protection lid
- Welded lid (in case of repair)
- Vertical position, inside hall
- Handling accidents
An **Integrated Safety Case** aims to support the application for the package design approval for transport and the application for the licensing of the storage facility (as part of the safety case for the storage facility). The Integrated Safety Case for a dual purpose storage and transport cask should be a collection of scientific and technical arguments and evidence in support of:

- The demonstration of compliance with the transport regulations TS-R-1 at the moment of transport, including transport after storage,

- The demonstration of compliance with the national regulations for spent fuel dry storage as they apply to the dual purpose cask itself during storage.
Extract from the Terms of Reference

Scope of Work

1.1 The general scope of the work of the Working Group is to provide guidance material on the preparation of Safety Cases for dry cask Storage and Transport Systems. For the purposes of the WG “Storage” (Short and Long term) is defined in Appendix I of SSG -15 (DS 371).

1.2 The WG shall make recommendations for a Regulatory Authority approval system which issues a single cask approval covering both storage and transport.

1.4 The initial scope will only consider dual purpose metal storage and transport casks, and as far as possible canisters (as potential parts of a transport package after storage). Only dry storage shall be considered.

1.5 A dual purpose cask is one which is used for transport and storage. Multi purpose casks designed for transport, storage and ultimate disposal are outside of the scope of the work of the WG. A consequence of this is that it must be practicable to retrieve the fuel from the cask after either storage or transport.
3.6 The safety requirements for off site transport for existing applications are well understood and specified in TS-R-1. The safety requirements for off site transport after several decades of storage are less well understood. The WG shall review the requirements of TS-R-1 for their relevance to transport after storage and, as necessary, make recommendations for changes to those regulations to TRANSSC.

3.8 The WG shall give consideration to specifying the scope of a Management System which clearly identifies management roles and responsibilities during all phases of the storage and transport processes.

3.9 The WG shall consider how records of the history of the fuel and casks prior to and during storage shall be maintained throughout and following the storage period.

3.10 The integrated Safety Case shall consider the influences of ageing mechanisms (chemical, mechanical, thermal, irradiation, changes in reactivity etc). The WG shall consider these effects in its determination of the requirements for storage and transport.

3.11 The WG shall give consideration to specifying a surveillance and maintenance regime which ensures that the casks are in a state fit for preparation for transport throughout the whole of the storage period.

3.13 The WG shall consider how changes to the applicable requirements, including national and international regulations, during the storage period shall be addressed in the Storage and Transport safety justification. Methods to be considered shall include “Gap analysis” and transitional arrangements such as “Grandfathering”. For the purposes of this discussion Gap analysis means identification and evaluation of the impact of the differences between the initially approved storage and transport assessment and any new regulatory requirements or technical findings.
Expected Output of the Working Group

4.1 An IAEA TECDOC (as a supporting document to DS284, SSG 15 and TS-G-1.1) containing recommendations and guidance for the structure and contents of an Integrated Safety Case for a dual purpose Storage and Transport Cask.

4.2 Recommendations, to TRANSSC, WASSC, RASSC and NUSSC as appropriate, for changes to be made to existing IAEA requirements and guidance relevant to the licensing and use of Storage and Transport Casks.
ToR, Basic Reference Material to be considered

3.5 The WG shall identify and specify the safety requirements for storage. Useful background documents for this purpose are:

IAEA SSG 15 (DS 371) Chapter 5
IAEA DS 284 Chapter 4
IAEA GS-R-5
WENRA - Waste and Spent Fuel Storage Safety Reference Levels Report Oct 2.0
Existing national regulations and guidance material
USA – 10 CFR 72
USA – NUREG 1536 – Standard Review Plan for Dry Cask Storage Systems
German RSK Safety Guideline for Dry Interim Storage of Irradiated Fuel Assemblies in Storage Casks, April 5 2001,
SUJB Guideline BN-02.2 (CZ)
IAEA-TECDOC-1532 - Operation and Maintenance of Spent Fuel Storage and Transportation Casks/Containers
Working Methods

1.3 The planning assumption is that a WG plenary will meet once a year, normally in Vienna. As determined by the WG other meetings and consultancies may take place.

1.4 The target date for completion of the work of the WG is the end of 2013.

1.6 The existing guidance documents published by the IAEA are generic in nature. The output of the WG shall be specific. As far as is practicable worked examples will be used to explain the application of the methodology described in the Safety Report. Candidates for such specific examples would include aging assessments of metallic and elastomeric seals, closure and trunnion bolts and neutron shielding materials.

1.7 The WG should consider the template provided in the “Technical Guide - Package Design Safety Reports for the Transport of Radioactive Material” for the structure of the Storage and Transport Cask Safety Case. This publication is available from several Transport Competent Authority web sites including those of the UK DfT, French ASN and German BfS.

1.8 There are a number of other IAEA working groups and consultancies whose activities relate closely to the work of this WG. The WG shall take advice from the IAEA secretariat to ensure that its work is aligned with that of the other groups and consultancies, so far as is practicable, to avoid duplication of effort.
IAEA-TECDOC-DRAFT

Dual purpose cask safety case for transport/storage casks containing spent fuel

Draft report of WASSC/TRANSSC joint working group 2011-2013
Draft 0: 28 April, 2011
Structure of Dual Purpose Cask Safety Case

Part 1

- Administrative Information
- Specification of Radioactive Contents
- Specification of Dual Purpose Cask
- Dual Purpose Cask Design Criteria and Performance Characteristics
  - Operational Scenarios
  - Impact Conditions
  - Design Criteria
  - Performance Characteristics
  - Ageing Considerations
- Compliance with Regulatory Requirements
  - Operation
  - Maintenance
- Management System

Part 2

- Structural Analysis
  - Subdocument (if necessary)
- Thermal Analysis
- Activity Release Analysis
- External Dose Rates Analysis
- Criticality Safety Analysis
Future Work

- Refinement of the draft TECDOC in correspondence groups on 5 work packages within next 9 months

- Preparation of a consolidated new draft (CSM optional)

- Next Plenary Meeting: 16-20 April 2012