43rd Meeting of the Waste Safety Standards Committee

12 – 15 June 2017

Agenda Item W3.2
Draft Safety Guide DS487: Design of Fuel Handling and Storage Systems for Nuclear Power Plants (Revision of NS-G-1.4)
– For approval for submission to the Member States –

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Outline

• Background information
• Overview of the document
• Fukushima implications
• Status of the document
• WASSC/NUSSC comments – Summary, highlighting resolution
• Requested action
Design of Fuel Handling and Storage Systems for NPPs

• The document (NS-G-1.4) was first published in 2003.

• The current revision (DS487) was initiated to
  – comply with the long term structure of safety standards approved in 2008
  – ensure coherency and consistency with all safety requirements in SSR-2/1 Rev 1 (2016)
  – incorporate experience on application of the documents, and the operating experience feedback from the IAEA Incident reporting systems, and the feedback from the accident at the Fukushima-Daiichi NPP
Overview of the Document

• The scope of NS-G-1.4 remains essentially unchanged
  – Application primarily to land based stationary NPPs
  – Fuel handling and storage systems that remain part of the operational activities of nuclear reactor(s)

• The new information in DS487 includes
  – All relevant safety requirements in SSR-2/1 Rev 1 and associated design recommendations
  – Plant states to be taken into account in design
  – Design limits for each plant state
  – Reliability in design for accident conditions

• Other Changes
  – Major structure changes
    from “fresh fuel handling & storage vs spent fuel handling and storage”
    to “design basis for fuel storage systems vs design basis for fuel handling systems”
Fukushima Implications

- Application of strengthened defence in depth to the design
  - Multiple means to remove decay heat from irradiated fuel and to maintain subcriticality margins in the various plant states.
  - Redundancy, diversity and independency among these means; Implemented combination of these should be adequate to demonstrate that the uncovering of the fuel assemblies is prevented with a high level of confidence.
Status of the Document

- The DPP was approved by the Committees in April 2014
- The first draft was developed in four Consultancy Meetings during 2015-2017
  - Submission to Committees for review and comment on April 2017
  - Table of resolution of Committees’ comments posted on the website June 2017
- Submission to the Committee for approval for submission to MS
WASSC/NUSSC Member Comments: Summary

- Hundred and forty three (143) comments from Belgium, Finland, Germany, Pakistan, U.K and ENISS
  - The comments were mainly for clarification and some technical comments.
  - All comments were addressed and resolutions were presented in the comment resolution table.
  - **There are no unresolved comments**
WASSC/NUSSC Member Comments: Highlighting Resolution

- Some important comments that were accepted and made the original DS487 text significantly changed:

<table>
<thead>
<tr>
<th>Comment on:</th>
<th>Affected paras.</th>
<th>Modification</th>
<th>Rationale</th>
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| Maintaining subcriticality margins | 2.5, 3.99      | • Separate “control of geometry” to prevent criticality and “use of physical means or physical processes” to increase subcriticality margins | • Clarification  
                          |                                |                                                | • Consistent with SSG-27                                  |
| Defence in depth          | 3.6, 3.7        | • Clarify the need for redundancy, diversity and independency.               | • Clarification                                |
| Inspection or repair equipment | 5.1            | • Apply a graded approach compared to fuel handling systems                  | • Economic reason                             |
| Appendix                  | Appx 1          | • Remove the table for seismic design qualification                         | • NS-G-1.6 under revision                      |
Requested Action

Approval by WASSC to submit to MS for review and comment
Thank you!