Agenda Item W 2.6
Draft Safety Guide DS516: Criticality Safety in the Handling of Fissile Material (Revision of SSG-27)
– For approval for submission to Member States for comments –
Background (1)

- 6 specific safety guides (SSGs) for nuclear fuel cycle facilities are being revised
  - SSG-5, Safety of Conversion Facilities and Uranium Enrichment Facilities
  - SSG-6, Safety of Uranium Fuel Fabrication Facilities
  - SSG-7, Safety of Uranium and Plutonium Mixed Oxide Fuel Fabrication Facilities
  - SSG-27, Criticality Safety in the Handling of Fissile Material
  - SSG-42, Safety of Nuclear Fuel Reprocessing Facilities
  - SSG-43, Safety of Nuclear Fuel Cycle Research and Development Facilities

- The guides need to be revised to account for:
  - Recently published SSR-4 and GSRs Part 4, 5, 6 and SSR-5 and SSR-6
  - Feedback from the use of the document by MSs
  - Operating experience feedback (OEF) from FINAS
  - Experience gained from SEDO missions
• Revision by Amendment in three stages:
  • Group 1 (DS516)
    • SSG-27 Criticality Safety in the Handling of Fissile Material (2014)
  • Group 2 (DS517)
    • SSG-6 Safety of Uranium Fuel Fabrication Facilities (2010)
    • SSG-7 Safety of Uranium and Plutonium Mixed Oxide Fuel Fabrication Facilities (2010)
  • Group 3 (DS518)
    • SSG-42 Safety of Nuclear Fuel Reprocessing Facilities (2017)

• The Guides will remain as separate publications
Background (3)

1. Technical Meetings on criticality safety in the nuclear fuel cycle in 2014 and 2018 with over 30 participants in each

2. DPP-516 Approved by CSS in April 2019

3. Two Consultancy Meetings in December 2018 and March 2019

4. Draft circulated to SSC Members in August 2019
Scope

- The Scope and Objectives of the Guide remain unchanged, however were better specified;
- Guidance and Recommendations addressing new requirements in SSR-4;
- The chapter on Management System was further developed in line with other recently published Safety Guides;
Proposed Structure

• The Structure of the Safety Guide remains unchanged

• Relevance to WASSC:

  1. SSG-27 applies also to decommissioning and disposal. Also supplements transport guidance.

  2. Subsection on “Waste and Decommissioning” split in two.
Comments and Resolutions

• The SSC members that commented on DS516 supported its scope and content, most comments were editorial;

• 104 comments received from 11 Member States+ ENISS;

• Vast majority of the comments were relevant and accepted and contributed to a better draft DS516;
## Comments and Resolutions

<table>
<thead>
<tr>
<th>Country / Organization</th>
<th>No. of comments</th>
<th>Accepted</th>
<th>Accepted with modifications</th>
<th>Rejected</th>
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# Rejected comments

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<tr>
<th>1.5</th>
<th>It also gives insights on how to minimize the consequences of this if it were to occur ..</th>
<th>Mitigation and CAAS mentioned several times, plus whole section (6) on EPR</th>
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<tbody>
<tr>
<td>General</td>
<td>DS-516 should be systematically reviewed against SSR-4 requirements</td>
<td>It also applies to other requirements publications</td>
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<td>3.22</td>
<td>The materials with low density..</td>
<td>“The” not required</td>
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<td>4.40</td>
<td>Move burnup credit to here</td>
<td>Burnup credit is not applied to fresh fuel materials</td>
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<td>5.46</td>
<td>Delete burnup credit from here</td>
<td>Burnup credit specific to used fuel</td>
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<tr>
<td>3.44</td>
<td>Delete principles of redundancy.... retaining defence in depth...</td>
<td>Paragraph concerns the principles of redundancy etc and DiD has its own subsection in DS516</td>
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<td>A graded approach is suggested...</td>
<td>A graded approach is required...{by all SSR}</td>
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<td>1.4</td>
<td>Add “enrichment”</td>
<td>Note added elsewhere to clarify “nuclide composition”</td>
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</table>
Other Clarifications

1. Phrase “nuclide composition” encompasses;
   “enrichment”, “effective enrichment”, “plutonium vector” and “isotopic composition”

2. The objective of this Safety Guide is to provide guidance and recommendations on meeting the relevant requirements for;
   – Ensuring subcriticality under normal and credible abnormal conditions;
   – Minimizing the consequences if a criticality accident were to occur;
   – Estimating the credible consequences of a potential criticality accident;

   in specific operations involving fissile material outside of reactor cores in order to ensure criticality safety at all times.

   Clarifications - actual objectives of SSG-27 not changed

3. Quoting of requirements and ‘should’
   - Draft was reviewed and essential updates made
   - Use of shall and should now improved
WASSC is kindly requested to approve the draft DS516 for submission to Member States for comments.
Thank you!