44th Meeting of the Radiation Safety Standards Committee (RASSC)

Draft Safety Guide
DS500 Application of the Concept of Clearance

Step 5 – Preparing the draft

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WES / NSRW
Revision of RS-G-1.7

New Safety Guide on Application of the Concept of Exemption (DS499)

New Safety Guide on Application of the Concept of Clearance (DS500)

Being developed in parallel
Current guidance in RS-G-1.7

- Provides mass specific values that can be used for exemption or clearance (unconditional), as appropriate, of bulk quantities of solid material.
- Values are provided for both natural and artificial radionuclides.
- The models used in the calculations of individual dose are described in SRS-44. Those scenarios are primarily relevant for clearance, since these were found to be the most restrictive.
- These values for exemption and clearance of bulk amounts of material now appear in GSR Part 3, together with the values for exemption of moderate amounts of material from SS-115.
- Regarding natural radionuclides, the values set out in RS-G-1.7 were selected on the basis of consideration of the upper end of the worldwide distribution of activity concentrations in soil provided by UNSCEAR.
New Safety Guide on Application of the Concept of Clearance

- Lead committee: WASSC
- Other committees: RASSC, TRANSSC
- Scientific secretary: V. Ljubенов, WES
Justification

• The RS-G-1.7 was based on an older version of the BSS

• Basic information from the RS-G-1.7 incorporated into the new BSS (GSR Part 3), much of the information in RS-G-1.7 is now redundant

• GSR Part 3 introduced new concepts and definitions (exposure situations)

• GSR Part 3 does not expand upon the application of the concepts of exemption and clearance, but assumes that further guidance would be provided

• Need to provide guidance consistent with the revised BSS and other revised requirements (GSR Part 6)
Justification

• Information in RS-G-1.7 on application of clearance still relevant, but MS noted it should be expanded to provide more details on:
  – clearance process;
  – establishment of national regulations;
  – planning, organization and implementation;
  – technical and safety implications;
  – resources needed to implement the clearance process.

• RS-G-1.7 does not provide guidance on clearance of building and equipment based on surface contamination measurements, on clearance of liquids and gases and on conditional clearance

NEW SAFETY GUIDE IS NEEDED
Objective and Scope

- The objective of the Safety Guide is to provide detailed guidance on the application of the concept of clearance for materials and buildings that are to be released from regulatory control.

- There is no intention to revise numerical values provided in GSR Part 3.

- Clarification on the use of terminology, especially the use of terms clearance and release;

- Responsibilities of the licensee and the regulatory body;

- All relevant steps of the clearance process including characterization, determination of the nuclide vector, measurement techniques, sampling, management of the clearance process;

- Mass specific and surface specific clearance criteria for unconditional clearance;
Objective and Scope

- Examples of derivation of mass specific and surface specific clearance criteria for conditional clearance (actual values would depend on specific conditions applied, so no universal set of values could be proposed);
- Case by case approach, which can be used for small quantities of material, or for other situations where the assumptions for the generic derivation of clearance levels do not apply;
- Provide explanations on needs for control of conditionally cleared materials (for example during transport), clarify at which point clearance act happens in case of conditional clearance;
- Clearance in an area affected by consequences of a nuclear or radiological accident;
- Considerations of clearance of liquids;
- Consideration of clearance of gases;
Objective and Scope

- Additional considerations for building materials containing naturally occurring radionuclides;
- Considerations of averaging masses and averaging areas;
- Discussion of the degree of homogeneity that was assumed in the calculation of the clearance levels and the implications for application of the clearance levels to non-homogenous material;
- Involvement of interested parties.

The guide will not address:

- Exemption (DS499)
- Application of radiological criteria for international trade of non-food commodities containing radionuclides (separate publication to be prepared)
- Release of sites from regulatory control (Safety Guide WS-G-5.1, its revision will be discussed soon).
Structure

1. Introduction
   1.1 Background
   1.2 Objective
   1.3 Scope
   1.4 Structure

2. Regulatory framework for clearance
   2.1 General
   2.2 Responsibilities of the Regulatory Body
   2.3 Responsibilities of the Licensee
   2.4 Organization and implementation of the clearance process
   2.5 Graded approach
3. Concept of Conditional Clearance
   3.1 Radiological basis
   3.2 Options for management of material

4. Clearance of solid material
   4.1 General
   4.2 Characterisation of the material to be cleared
   4.3 Mass specific criteria for clearance
   4.4 Surface criteria for clearance
   4.5 Case by case approach
   4.6 Monitoring programme
   4.7 Statistical Confidence and Uncertainties of Clearance Measurement Results
   4.8 Aspects Related to Use of Mixing as Part of the Material Management Process
5. Clearance of liquid material
   5.1 General
   5.2 Application of concept

6. Clearance of gaseous material
   6.1 General
   6.2 Application of concept

7. Involvement of interested parties

Annex I: Dosimetric modelling for derivation of radionuclide specific values for clearance based on surface contamination measurements

Annex II: Examples of surface specific values for unconditional clearance

Annex III: Examples of mass specific values for conditional clearance
<table>
<thead>
<tr>
<th>STEP</th>
<th>Description</th>
<th>Date</th>
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<tbody>
<tr>
<td>1</td>
<td>Preparing a DPP</td>
<td>July 2016</td>
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<td>2</td>
<td>Approval of DPP by the Coordination Committee</td>
<td>September 2016</td>
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<td>3</td>
<td>Approval of DPP by the relevant review Committees</td>
<td>November 2016</td>
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<td>4</td>
<td>Approval of DPP by the CSS</td>
<td>November 2017</td>
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<tr>
<td>5</td>
<td>Preparing the draft</td>
<td>December 2017 - June 2019</td>
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<tr>
<td>6</td>
<td>Approval of draft by the Coordination Committee</td>
<td>August 2019</td>
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<tr>
<td>7</td>
<td>Approval by the relevant review Committees for submission to Member States for comments</td>
<td>November 2019</td>
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<tr>
<td>8</td>
<td>Soliciting comments by Member States</td>
<td>December 2019 – March 2020</td>
</tr>
<tr>
<td>9</td>
<td>Addressing comments by Member States</td>
<td>April 2020</td>
</tr>
<tr>
<td>10</td>
<td>Approval of the revised draft by the Coordination Committee, Review in NS-SSCS</td>
<td>October 2020</td>
</tr>
<tr>
<td>11</td>
<td>Approval by the relevant review Committees</td>
<td>June 2021</td>
</tr>
<tr>
<td>12</td>
<td>Endorsement by the CSS</td>
<td>November 2021</td>
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<tr>
<td>13</td>
<td>Establishment by the Publications Committee and/or Board of Governors (for SF and SR only)</td>
<td>March 2022</td>
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<td>14</td>
<td>Target publication date</td>
<td>August 2022</td>
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Progress in preparing the draft

- First two parallel consultancy meetings on DS499 and DS500 were held from 19 to 23 February 2018 in Vienna
- DS500 – consultants from Belgium, Germany, Japan and UK with experience from development of RS-G-1.7
- Joint sessions with DS499 drafting team to ensure consistency with regard to the scope of DS499 and DS500, boundaries and interfaces
- Information exchange session – presentations by consultants and by the IAEA staff on related practices and experiences in the Member States and on related IAEA activities
- Important discussions
  - how to address clearance in the context of environmental remediation, post-accident situations and in other existing exposure situations
  - surface specific criteria for exemption / clearance
Progress in preparing the draft

- Proposed changes to the document structure
  - Add Section 4.6. Averaging masses and averaging areas
  - Add Appendix 1 - Release of material and waste from regulatory control in the context of existing exposure situation (tentative title)
- The meeting produced first incomplete draft of DS500 and prepared a plan for continuation of the drafting process
- Second consultancy meeting being held during this week with the same team of consultants
- Limited work done between the two meetings – draft of Appendix I
Comments and Resolutions

Not applicable at Step 5
For information only,
no action by the Committees requested
Thank you!