Joint Meeting of the
35th Radiation Safety Standards Committee / 36th Waste Safety Standards Committee

20-21 November 2013
Agenda Item RW9.2
DPP NST048 – Draft Implementing Guide on the
Security of Radioactive Material in Use and Storage and of Associated Facilities

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Background

- TecDoc 1355 released in 2003 as interim guidance
- Implementing Guide NSS 11 first published in 2009
- Preceded publication of NSS 20 – Nuclear Security Fundamentals and NSS 14 – Nuclear Security Recommendations on Radioactive Material and Associated Facilities
  - Both are higher level documents in the Nuclear Security Series
  - Terminology and topics first addressed in NSS 11 have been updated in NSS 20, 14
Why amend NSS No. 11?

• (1) Consistency with other publications in the Nuclear Security Series
  • In keeping with decision 3.16b of the May 2013 NSGC meeting
  • An Implementing Guide is currently under development (NST023) for NSS 13
  • Revising NSS 11 intended to provide a comprehensive structure for guidance on radioactive material and associated facilities in a parallel manner to nuclear material and facilities
Why amend NSS No. 11?

(2) Development of concepts for which further guidance is needed

- NSS 14 introduces security functions, including security management, and NSS 11 expands on this function and contains appendix of elements to be included in a security plan
- Neither NSS 11 nor NSS 14 describes the “how to” of security management elements in detail to be useful for operators
- An Implementing Guide, NST024 on Security Management and Security Plans has been drafted and consideration is being given whether to fold this guidance into NST048
Why amend NSS No. 11?

• (2) Development of concepts for which further guidance is needed (cont’d)
  • **Threat assessment** applied to radioactive material and associated facilities introduced in NSS 14, but not sufficiently developed in NSS 11
  • Feedback that guidance on threat assessments, particularly in non-nuclear States is **an immediate need**
  • Examination/analysis of alternative methodologies (beyond Design Basis Threat) should be performed; detailed guidance on performing and using threat assessments is needed
Why amend NSS No. 11?

• (3) Expansion of current scope
  • Currently, NSS 11 applies to sealed radioactive sources as defined in NSS 11 and the Code of Conduct
  • Note proposed title change of NSS 11
  • Proposal is to broaden the scope of NSS 11 to include all (non-nuclear) radioactive material in use and storage
  • Will require consideration of threats associated with unsealed radioactive material, and categorization of unsealed radioactive material in order to establish a graded security approach
Committee Reviews of DPP

- NUSSC Oct 2013-Done
- NSGC Oct 2013-Done
- RASSC and WASSC 20-21 Nov 2013

-Cleared by NUSSC with recommendation to expand list of relevant documents to include additional safety standards related to design and operation of nuclear installations

-NSGC approval of DPP subject to:
  - Early consideration of security-based categorization of radioactive material
  - Review of ToC to ensure coverage of all radioactive material
  - Use of the word ‘threat’ in objective and scope

-Hold TM before 120 MS comment period
Development Steps

- Gap analysis of NSS 14 and NSS 11 with security experts
  - November-December 2013
- 2-3 Consultancy Meetings including Secretariat colleagues to consider the application of NSS 11 to all radioactive material in use and storage, and other topics to be elaborated
  - January-June 2014
- Drafting of NSS 11 through consultancy process in late 2014
Proposed Structure (Table of Contents in NSS 11 as basis)

- **Table of Contents (from NSS No. 11)**
- INTRODUCTION
  - 1.1. Background
  - 1.2. Objective
  - 1.3. Scope
- RESPONSIBILITIES OF THE STATE AND OPERATOR
  - Introduction
  - State
  - Operators
- SECURITY CONCEPTS
  - 3.1. Introduction
  - 3.2. Security culture
  - 3.3. Purpose of a security system
  - 3.4. Security functions
  - 3.5. Design and evaluation of security systems
  - 3.6. Integration of safety and security measures
  - 3.7. Graded approach to security
  - 3.8. Understanding and addressing the threat environment
    - 3.8.1. National threat assessment
    - 3.8.2. Design basis threat
    - 3.8.3. Insider threats
    - 3.8.4. Increased threat
  - 3.9. Vulnerability assessment
4. ESTABLISHING A REGULATORY PROGRAMME FOR RADIOACTIVE SOURCE SECURITY

4.1. Step 1: Establish graded security levels with associated goals and objectives

4.2. Step 2: Determine security level applicable to a given source/sources

4.2.1. Categorization of radioactive sources

4.2.2. Assigning security levels

4.2.3. Additional considerations for assigning security levels

4.3. Step 3: Select and implement a regulatory approach

4.3.1. Prescriptive approach

4.3.2. Performance based approach

4.3.3. Combined approach

APPENDIX I: DESCRIPTION OF SECURITY MEASURES

APPENDIX II: EXAMPLES OF CONTENT FOR A SECURITY PLAN

APPENDIX III: DESCRIPTION OF A VULNERABILITY ASSESSMENT

APPENDIX IV: ILLUSTRATIVE SECURITY MEASURES THAT MAY BE APPLIED TO SELECTED FACILITIES AND ACTIVITIES

REFERENCES

DEFINITIONS
Comment 1:
As an objective of NST048 is to broaden the scope of NSS 11 to include all radioactive material and associated facilities, consider that size of facilities and magnitude of consequences are quite different.

Resolution:
• NSS 11 proposes a graded approach to security, where highest consequence sources should receive highest levels of security
• Assign security level according to categorization based on “D” values
• Proposed expansion in scope will mean that guidance will need to be written such that it can be proportionately applied depending on the type of facility or material.
• When a facility contains nuclear material and other radioactive material, the protection requirements for both, per NSS 13 and 14, should be considered and implemented in a consistent and non-conflicting manner in order to achieve an adequate level of security.
Comment 2:

NST048 intends to broaden the scope of NSS 11 to all radioactive material in use and storage, including consideration of categorization scheme for unsealed radioactive material and the concept of threat assessment – Given these two topics, consider some preliminary work before DPP approval to ensure scope is appropriate.

Resolution:

• Secretariat was tasked by the NSGC in May 2013 to prepare a DPP to revise NSS 11 so feedback from all relevant committees prior to commencing work is being sought

• Studying the feasibility of particular scope questions will be the first step and inform the drafting process, but approval is required to commence work.
NUSSC comments

Comment 3:
Safety Standards in the DPP relate to radioactive sources, but scope of NST048 is intended to include all radioactive material so additional safety standards related to design and operation of nuclear installations should be added as these may store and use radioactive material.

Resolution:
• The documents noted in the DPP were taken from NSS11, but given proposed expansion of scope, consideration of other Safety Standards will be necessary.
• Initial studies and document development will be coordinated with Safety colleagues to ensure appropriate consideration of and coordination with Safety Standards.
• DPP has been amended to include additional relevant safety standards (version 4)
NUSSC comments

Comments 4-7:
Address items in the Table of Contents of DPP version 1, which was the ToC for NSS 14 instead of NSS 11. The DPP was subsequently corrected and reposted

• DS457 should be included in Section 5
• Use of the term “safety system” is not appropriate
• Security management is part of the ‘integrated management system’ and DS456 should be included in Section 5
• Safety considerations should be mentioned, i.e. ‘safety and security interface’
**NUSSC comments**

**Resolutions 4-7:**

- DS457 is a revision of GS-R-2 and deals with “Preparedness and Response for a Nuclear or Radiological Emergency” and is outside the scope of the proposed revision of NSS 11.
- NSS 11 contains a section called, “Integration of safety and security measures”
- NST024 on Security Management and Security Plans for Radioactive Material and Associated Facilities has been developed, with participation from Safety colleagues and taking DS456 into account during drafting; NST024 may be folded into NST048
NSGC Comments

• Received from:
  • Russia
  • France
  • Japan
Comment 1 (RUS):
Be clear throughout DPP that the scope is intended to include radioactive material in use and storage, and associated facilities and activities
Resolution:
• Scope of the revision is indicated in the proposed revised title of the document, as well as in Sections 2-4 of the DPP

Comment 2 (RUS):
Table of Contents should be reviewed before NSGC approval or stated to be reviewed during drafting (relates to change in scope from radioactive sources to all radioactive material)
Resolution:
• The TOC of NSS 11 was included in the DPP as a starting point, and will be revised to reflect the contents of the revised document
NSGC Comments

Comment 3 (RUS):
Verify time needed to prepare the draft following approval of the DPP.

Resolution:
• Given the proposed plan to convene smaller working groups to consider certain topics (categorization, threat assessment) in late 2013 and early 2014, drafting will take place in mid-2014 for completion by end of 2014.

Comment 4 (FR):
Para 3 should mention “defense in depth” as part of ”security concept”

Resolution:
• Section 3.5 of NSS 11 deals with “Design and Evaluation of Security Systems” and describes how a well-designed security system should integrate measures to perform all security functions consistent with security concepts, including defense in depth.
Comment 5 (Japan):

- The categorization system used in NSS 11 is based on RS-G-1.9
- Any change in categorization will require significant resources on the part of States and operators to adapt their current regulations and security systems
- Detailed discussion of categorization of unsealed radioactive material should be described in an Appendix to the revised NSS 11
Resolution – What’s already in NSS 11

- While NSS 11 guide does not specifically address the security of unsealed radioactive material, a State may choose to apply the security concepts and measures outlined in this guide to such material.
- For radioactive sources not listed in NSS 11, the regulatory body may assign a category to the source based on the $A/D$ ratio.
- In some activities, such as nuclear medicine, radionuclides with a short half-life are used in a source form that is unsealed. Examples of such applications include $^{99m}$Tc in radiodiagnosis and $^{131}$I in radiotherapy. In such situations, the principles of the categorization system may be applied to determine a category for the source.
- The regulatory body may assign a category to unsealed radioactive sources based on the $A/D$ ratio.
The document will need to consider…

• The relationship between classification of radioactive material for security purposes in NSS 11 and disposal purposes in GSG-1

• Cases where radioactive material meets the criteria for clearance, exemption or exclusion, or is discharged

• After disposal facilities have closed and are no longer under institutional control?
Next Steps…

• With assistance of source experts, Secretariat is undertaking a gap analysis of NSS 14 and NSS 11 to identify thematic areas for further expansion
  • Threat assessment
  • Interface between sources and nuclear facilities (source producers)
  • If/how to fold in security management piece
## Timeline

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<td><strong>STEP 1:</strong> Preparing a DPP</td>
<td>DONE</td>
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<td><strong>STEP 2:</strong> Approval of DPP by the Coordination Committee</td>
<td>DONE</td>
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<td><strong>STEP 3:</strong> Approval of DPP by the relevant review Committees</td>
<td>Oct-Nov 2013</td>
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<td><strong>STEP 4:</strong> Approval of DPP by the CSS</td>
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<td><strong>STEP 5:</strong> Preparing the draft (This step may include one or more consultancies to consider specific technical topics to be expanded in the revised NSS 11)</td>
<td>December 2014</td>
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<td><strong>STEP 6:</strong> Approval of draft by the Coordination Committee</td>
<td>Q1 2015</td>
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<td><strong>STEP 7:</strong> Approval by the relevant review Committees for submission to Member States for comments</td>
<td>Q1 2015</td>
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<td><strong>STEP 14:</strong> Target publication date</td>
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THANK YOU FOR YOUR ATTENTION!