

Document Preparation Profile (DPP)

Version 1, 1 April 2016

1. IDENTIFICATION

Document Category **Nuclear Security Series – Technical Guidance**

Working ID: **NST059**

Proposed Title: **Functional Specifications for Nuclear Security Detection Equipment and Systems**

Proposed Action: **Revision of Nuclear Security Series No. 1**

Review Committee(s) or Group: **NSGC**

Technical Officer(s): **Charles Massey**

2. BACKGROUND

Member States need technical guidance on the specifications for radiation detection equipment for use in nuclear security applications for detection of nuclear and other radioactive material out of regulatory control. Nuclear Security Series (NSS) No.1, Technical and Functional Specifications for Border Monitoring Equipment, was originally developed in 1999-2006 to fill this need because no testing standard was available for border monitoring equipment. Since that time, many industrial standards have emerged to address detection instrument specifications (ANSI, IEC¹). However, what is still lacking is a specification of parameters, features, and capabilities that are desired by end users in the Member States, and that are compatible with the applications of instruments under the nuclear security detection architecture concept as described in the Implementing Guide on Nuclear Security Systems and Measures for the Detection of Nuclear and Other Radioactive Material out of Regulatory Control (NSS No. 21). NSS No. 1 is limited to certain specific items of border monitoring equipment, but the detection architecture now has broader implications for which guidance is necessary. Additionally, NSS No. 1 was designated for restricted distribution, on the basis of proprietary and/possibly sensitive information, which has limited its use.

3. JUSTIFICATION

NSS No. 1 was published in 2006. Since that time, industrial standards have superseded the technical and testing specifications that were described in NSS No. 1. Guidance issued in the Nuclear Security Series since 2006 – notably the Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control (NSS No. 15) and the Implementing Guide on detection systems and measures NSS No. 21, have changed the context into which NSS No. 1 fits. Furthermore, the restriction on distribution of NSS No, 1 has significantly hindered its use and therefore its value as guidance to MS.

Additionally, radiation detection technologies have advanced and matured considerably as radiation detection systems have been deployed globally. End user experiences and lessons learned since that time have not been incorporated in NSS No. 1. The emphasis on testing specifications in NSS No. 1 is not useful for end users like Front Line Officers or expert support personnel. For example, some specifications are difficult to test or are not relevant to end users. To be more useful, the specifications should be functional, not technical. Rules for providing useful information for the end users and vendors need to be specified. Guidance on maintenance, sustainability, and training also needs to be

¹ International Electrotechnical Commission.

added. Lastly, the existing categorization of equipment in NSS No. 1 is not sufficient for end users and vendors – the new document will include a taxonomy of radiation detection equipment for specific applications.

4. OBJECTIVE

A revision of NSS No. 1 will provide end users and vendors of detection equipment with functional specifications that can be used in different configurations to fit the nuclear security detection architecture within a State.

The document should be freely available to Member States like the rest of the NSS documents. The document should also be agnostic to technology, so that it does not become obsolete as technology progresses. (Active interrogation methods will not be treated in detail because of insufficient deployment experience with these systems.) The new document should not compete or overlap with existing IEC and ANSI standards; these standards can continue to develop and advance as technology matures, but the new document would remain relevant. Testing specifications that are relevant to end users, specific applications, and conditions of use (e.g., specific to a maritime environment) will be included in the revised document.

5. SCOPE

The revised publication will address equipment and systems for the detection, as part of a national nuclear security regime, of nuclear and other radioactive material out of regulatory control. It will not address nuclear material or other radioactive material under regulatory control, and will not address actions to be taken if material is detected.

The scope of the new document is intended to be limited to the instruments used in detection and alarm adjudication; it is not intended to be applicable for crisis management or crime scene management.

6. PLACE IN THE OVERALL STRUCTURE OF THE RELEVANT SERIES AND INTERFACES WITH EXISTING AND/OR PLANNED PUBLICATIONS

The proposed revised Technical Guidance will support the implementing guidance in NSS No. 21 and in turn the relevant Recommendations in NSS No. 15. It will complement other existing guidance, including NSS No. 6 on Combating Illicit Trafficking, and NSS No. 18 on Nuclear Security Systems and Measures for Major Public Events.

It will also be developed to complement other publications under development, including NST042 on Planning and Organization Nuclear Security Systems and Measures for Nuclear and Other Radioactive Materials out of Regulatory Control and NST016 on Detection of Radioactive Material at Designated Points of Entry.

As Technical Guidance, this will not be an interface document.

7. OVERVIEW

The following outline is proposed. The sub-bullets are for example purposes, and the outline should not be limited to only the examples proposed.

1. Introduction
 - Background
 - Purpose
 - Scope

- Definitions
- 2. Taxonomy of Radiation Detection Equipment and Applications
 - Designated POE
 - Seaport
 - Airport
 - Land
 - Undesignated POE
 - Interior
- 3. Functional needs for end users (What is the mission to be accomplished?)
 - Overall Architectures
 - Concepts of Operations
 - Detection, Identification, and Localization Specifications for different applications
 - Isotope library specifications for different applications
 - Priority of selection of detectors (gamma only PRDs for FLOs?)
 - Networking specifications
 - Communication Links (voice, data)
 - Expert Support
- 4. Technical Specifications (How is the mission accomplished?)
 - Deployment Considerations [not limited to the examples below]
 - Easy swap-out of commercially available batteries
 - Indication of remaining battery life
 - Usability specifications for FLOs and Reachback
 - Weight specifications for different applications
 - User interface and next step instructions
 - Operational Limitations (what is the environment the detector must operate in?)
 - High background / Low background environments
- 5. Testing Specifications for Different Applications, beyond existing industrial standards
 - Designated POE
 - Seaport
 - Airport
 - Land
 - Undesignated POE
 - Interior
- 6. Sustainability
 - Training
 - Maintenance
 - Human Resources
- 7. Advanced Technologies
 - Imaging Technologies
 - List mode data acquisition
- 8. Appendices
 - Data Format Review (IEC, ANSI, Daily File)

8. PRODUCTION SCHEDULE:

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STEP 1: Preparing a DPP	DONE
STEP 2: Approval of DPP by the Coordination Committee	April 2016
STEP 3: Approval of DPP by NSGC	June 2016
STEP 4: Approval of DPP by the CSS	

STEP 5: Preparing the draft	
STEP 6: Approval of draft by the Coordination Committee	March 2017
STEP 7: Approval by the relevant review Committees for submission to Member States for comments	June 2017
STEP 8: Soliciting comments by Member States	August 2017
STEP 9: Addressing comments by Member States	January 2018
STEP 10: Approval of the revised draft by the Coordination Committee Review in NS-SSCS	March 2018
STEP 11: Approval by the relevant review Committees	June 2018
STEP 12: Endorsement by the CSS	
STEP 13: Establishment by the Publications Committee and/or Board of Governors (for SF and SR only)	August 2018
STEP 14: Target publication date	Q2 2019

9. RESOURCES

To support the development of the proposed revision, it is estimated that 3 CMs will be held in 2016/2017, with an additional CM in 2018 to address Member State comments. NSNS efforts to support the document to completion are estimated at 90 person-days.