Document Preparation Profile (DPP)
Version 3, 12.04.2021

1. IDENTIFICATION

Document Category or set of publications to be revised in a concomitant manner

Specific Safety Guide

Working ID: **DS529**

Proposed Title: **Investigation of Site Characteristics and Evaluation of Radiation Risks to the Public and the Environment in Site Evaluation for Nuclear Installations**

Proposed Action: **Revision of Safety Guide NS-G-3.2, Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear Power Plants (2002)**

Review Committee(s) or Group: **NUSSC, RASSC, WASSC, EPReSC**

Technical Officer(s): **Ayhan Altinyollar (EESS/NSNI), Diego Telleria (WES/NSRW)**

2. BACKGROUND

This revised Specific Safety Guide will supersede the IAEA Safety Guide NS-G-3.2, "Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear Power Plants" and expand the scope from NPPs to all nuclear installations.

IAEA Safety Guide NS-G-3.2 was published in 2002 to provide recommendations and guidance for investigations relating to population distribution, and on the dispersion of effluents in air, surface water and groundwater. It was intended to help determine whether the site selected for a nuclear power plant satisfies national requirements and whether possible radiological exposure and hazards to the population and to the environment are controlled within the limits set by the regulatory body, with account taken of international recommendations.

It also provided recommendations and guidance for fulfilling the requirements of the Safety Requirements publication 50-C-S, "Code on the Safety of Nuclear Power Plants: Siting" of 1988. In 2003, 50-C-S was superseded by NS-R-3, "Site Evaluation for Nuclear Installations", which was later revised by amendment and published in 2016 as NS-R-3 (Rev.1). NS-R-3 (Rev.1) was superseded by IAEA Specific Safety Requirements SSR-1, "Site Evaluation for Nuclear Installations" in 2019.

In 2018 the IAEA Safety Guide GSG-10, Prospective Radiological Environmental Impact Assessment for Facilities and Activities, was published, which provides recommendations and guidance on a general framework for performing prospective radiological impact assessments for all facilities and activities, to estimate and control the radiological effects on the public and on the environment.

3. JUSTIFICATION FOR THE PRODUCTION OF THE DOCUMENT

The revised Safety Guide will provide guidance on the investigation of site characteristics and the evaluation of radiation risks to the public and the environment as part of the process of site evaluation

of nuclear installations. It will directly support Requirement 12 (paras 4.38-4.40), Requirement 13 (paras 4.41-4.43), Requirement 14 (para. 4.46), Requirement 25 (paras 6.1-6.7), Requirement 26 (paras 6.8-6.10), Requirement 27 (para. 6.11), Requirement 28 (paras 7.1-7.3) and Requirement 29 (paras 7.4-7.5) of SSR-1.

The current Safety Guide NS-G-3.2 issued in 2002 needs an update addressing the following aspects:

- Changes of the applicable safety requirements in SSR-1, SSR 2/1 (Rev.1), SSR-3, SSR-4, GSR Part 3, GSR Part 4 (Rev. 1) and GSR Part 7;
- Considerations fulfilling the gap between the existing publication and the state-of-the-art practice in IAEA Member States;
- Evolution of the approach, methodology and techniques to evaluate the radiation risks to the public and the environment of nuclear installations also taking account of recent relevant IAEA publications on dose assessment and radiological environmental impact assessment for facilities and activities (in particular GSG-10 and the forthcoming update to Safety Reports Series No. 19, in other words, the consideration of potential exposures for all nuclear installations using a graded approach and examples of new findings in methodologies and techniques to evaluate the radiation risks including the explicit consideration of the protection of the environment, respectively).
- Guidance on how to apply the graded approach to nuclear installations other than NPP.

Furthermore, the terminology needs to be revised and made consistent with the new definitions in the Safety Requirements and the IAEA Safety Glossary (2018 Edition).

The revision will also take into consideration feedback from existing experience, technical safety review services, advisory services and the state-of-the-art practice in Member States.

4. OBJECTIVE

The main objective of the revised Safety Guide is to provide recommendations and guidance on investigation of site characteristics and evaluation of radiation risks to the public and the environment for nuclear installations meeting the applicable safety requirements, including those from GSR Part 3, GSR Part 4 (Rev. 1), GSR Part7, SSR-1, SSR 2/1 (Rev.1), SSR-3 and SSR-4. The second objective is to make recommendations on how to apply the existing IAEA guidance on radiological environmental impact assessment in the process of site evaluation and how to do it in a graded way.

This Safety Guide is intended for use by regulatory bodies, which are responsible for establishing regulatory requirements and by operating organizations, which are directly responsible for safety of nuclear installations and for the protection of people and the environment from harmful effects of ionizing radiation.

5. SCOPE

The scope of the revised Safety Guide will cover investigation of site characteristics including population distribution, uses of land and water in the region of the nuclear installation site, background levels of radioactivity in the environmental media, meteorological, hydrological and hydrogeological characteristics of region of the nuclear installation site, which provide the input data to evaluation of the radiation risks to the public and the environment for nuclear installations. The revision will also cover

how to apply the existing IAEA guidance on radiological environmental impact assessment (including analysis of dispersion of radionuclides in atmosphere, analysis of transport of radionuclides in surface and ground water and assessment of overall radiological impact) in the process of site evaluation. Feasibility of effective emergency response actions will be also included. Application of management system for those activities will be addressed. The scope of the revised Safety Guide will also be extended to cover dose assessment.

The scope will address all nuclear installations[1], as defined in the IAEA Safety Glossary (2018 Edition). The guidance will be given for nuclear power plants and application of this guidance for other installations using the graded approach will be discussed.

The guidance will be applicable to all phases of nuclear installations (e.g.; site selection, site characterization; operation, and decommissioning) as appropriate.

Security aspects are not within the scope of this safety guide.

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

The proposed of Safety Guide falls within the thematic area of site evaluation and will interface with the following IAEA Safety Standards and other publications (this is not, and cannot be, regarded as an exclusive or exhaustive list):

- IAEA Safety Standards Series No. SSR-1, Site Evaluation for Nuclear Installations (2019)
- IAEA Safety Standards Series No. SSR-2/1 (Rev. 1), Safety of Nuclear Power Plants: Design (2016)
- IAEA Safety Standards Series No. SSR-3, Safety of Research Reactors (2016)
- IAEA Safety Standards Series No. SSR-4, Safety of Nuclear Fuel Cycle Facilities (2017)
- IAEA Safety Standards Series No. GSR Part 2, Leadership and Management for Safety (2016)
- IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards (2014)
- IAEA Safety Standards Series No. GSR Part 4 (Rev. 1), Safety Assessment for Facilities and Activities (2016)
- IAEA Safety Standards Series No. GSG-10, Prospective Radiological Environmental Impact Assessment for Facilities and Activities (2018)
- IAEA Safety Standards Series No. GSG-9, Regulatory Control of Radioactive Discharges to the Environment (2018)
- IAEA Safety Standards Series No. GSR Part 7, Preparedness and Response for a Nuclear or Radiological Emergency (2015)
- IAEA Safety Standards Series No. SSG-35, Site Survey and Site Selection for Nuclear Installations (2015)
- IAEA Safety Standards Series No. SSG-18, Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations (2011)
- IAEA Safety Standards Series No. SSG-2 (Rev. 1), Deterministic Safety Analysis for Nuclear Power Plants (2019)
- IAEA Safety Standards Series No. SSG-4, Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants (2010)

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[1] Any nuclear facility subject to authorization that is part of the nuclear fuel cycle, except facilities for the mining or processing of uranium ores or thorium ores and disposal facilities for radioactive waste. This definition thus includes: nuclear power plants; research reactors (including subcritical and critical assemblies) and any adjoining radioisotope production facilities; storage facilities for spent fuel; facilities for the enrichment of uranium; nuclear fuel fabrication facilities; conversion facilities; facilities for the reprocessing of spent fuel; facilities for the predisposal management of radioactive waste arising from nuclear fuel cycle facilities; and nuclear fuel cycle related research and development facilities.

- IAEA Safety Standards Series No. RS-G-1.8, Environmental and Source Monitoring for Purposes of Radiation Protection (2005)
- IAEA Safety Standards Series No. GSG-2, Criteria for Use in Preparedness and Reponses for a Nuclear or Radiological Emergency (2011)
- Safety Reports Series No. 19 (Rev. 1), Assessment of the Impact of Radioactive Discharges to the Environment (in preparation).

7. OVERVIEW

The planned table of contents includes the following sections:

1. Introduction
2. General approach and considerations
3. Environmental characteristics and population distribution
4. Analysis of dispersion of radionuclides in atmosphere
5. Analysis of dispersion of radionuclides in surface water
6. Analysis of dispersion of radionuclides in groundwater
7. Summary of site characteristics
8. Assessment of overall radiological impact
9. Monitoring of radioactivity in the environment
10. Consideration of the feasibility of effective emergency response actions
11. Special considerations in the assessment of nuclear installations other than nuclear power plants
12. Application of management system

References
Annexes

8. PRODUCTION SCHEDULE:

Provisional schedule for preparation of the document, outlining realistic expected dates for each step

	A*	B*	C*
STEP 1: Preparing a DPP	DONE		
STEP 2: Approval of DPP by the Coordination Committee	DONE		
STEP 3: Approval of DPP by the relevant review Committees	DONE		
STEP 4: Approval of DPP by the CSS	April 2021		
STEP 5: Preparing the draft Indicate as to whether a TM is expected to be organized for the preparation of the draft	TM 2Q 2021 Final Draft 2Q 2021		
STEP 6: Approval of draft by the Coordination Committee	2Q 2021		
STEP 7: Approval by the relevant review Committees for submission to Member States for comments	4Q 2021		
STEP 8: Soliciting comments by Member States	4Q 2021		
STEP 9: Addressing comments by Member States	1Q 2022		
STEP 10: Approval of the revised draft by the Coordination Committee	2Q 2022		
STEP 11: Approval by the relevant review Committees	4Q 2022		
STEP 12: Endorsement by the CSS	2Q 2023		
STEP 13: Establishment by the Publications Committee and/or Board of Governors (for SF and SR only))	3Q 2023		
STEP 14: Target publication date	4Q 2023		

- *Column A for Safety Fundamentals, Safety Requirements and Safety Guides.*
- *Column B for Nuclear Security Series publications*
- *Column C for TECDOCs, safety reports and other publications*

9. RESOURCES

20 staff-weeks of professional staff plus 80,000 Euro for a Technical Meeting and consultancy meetings.