Document Preparation Profile (DPP)

1. IDENTIFICATION

Document Category	**Safety Guide**
Working ID:	**DS432**
Proposed Title:	**Radiation Protection of the Public and the Environment**
Proposed Action:	**new document**
Review Committee(s):	**RASSC, (leading committee)**
	WASSC, NUSSC, TRANSSC
Technical Officer(s):	**T. Boal**

2. BACKGROUND/RATIONALE

Three basic types of exposure are considered in radiation protection, namely occupational, medical, and public. The protection of the environment is an important additional issue, which is closely linked with protection of the public. The proposed structure of the revised BSS (DS379) also makes use of this categorization for defining the relevant radiation protection requirements, as appropriate, according to the exposure situation, whether planned, emergency or existing.

For occupational exposure, there is a proposal to combine all existing guidance dealing with occupational radiation protection. Such a document would underpin guidance on occupational radiation protection which features in many "facilities and activities specific" Safety Guides, whether in the radiation, waste or nuclear safety areas.

Medical exposure is covered in one Safety Guide, RS-G-1.5.

Public exposure encompasses all exposures of the public other than occupational exposure and medical exposure. Like occupational radiation protection, protection of the public and environment is a matter that is covered in many general and facilities and activities specific Safety Guides, but unlike occupational radiation protection, there is no single Safety Guide that deals solely with the basic generic criteria on this matter. Protection of the public and environment is covered in facilities and activities specific safety guides for planned exposure situations (facilities and activities using radiation sources, nuclear installations, mining and processing of raw materials), in two safety guides on emergency exposure situations (GS-G-2.1, DS44), and in two safety guides on existing exposure situations (GS-G-3.1, DS421).

Regarding protection of the environment, the Safety Fundamentals (SF-1) states: "Whereas the effects of radiation exposure on human health are relatively well understood, albeit with uncertainties, the effects of radiation on the environment have been less thoroughly investigated. The present system of radiation protection generally provides appropriate protection of ecosystems in the human environment against harmful effects of radiation exposure. The general intent of the measures taken for the purposes of environmental protection has been to protect ecosystems against radiation exposure that would have adverse consequences for populations of a species (as distinct from individual organisms)". The

revised BSS includes a requirement that registrants and licensees make an assessment of the potential impacts on the environment for sources for which they are responsible, when required to do so by the regulatory body.

There is a need for a specific Safety Guide that provides general guidance on the application of the Safety Principles of the SF1 and requirements of the revised BSS in relation to protection of the public and environment in planned, existing and emergency exposure situations. This is essential to ensure a consistency of approaches that includes an integrated consideration of the radiation protection of the public and the environment.

The following are some of the main topics of a generic nature:

- Justification in all exposure situations (planned, emergency, existing);
- Optimization of protection in all exposure situations;
- Dose and risk constraints in planned exposure situations at the design and planning stages;
- Role of reference levels in emergency and existing exposure situations;
- Representative person in all exposure situations;
- Dose limits for planned exposures.

These concepts will be expressed in practical terms.

3. OBJECTIVE

The objective of the Safety Guide is to develop in detail the generic criteria for protection of the public and the environment against radiation exposure in planned, emergency and existing exposure situations as proposed in the revised BSS.

4. JUSTIFICATION

A review of more than 20 Safety Guides that deal in some way or other with the protection of the public and environment has been carried out. This identified that guidance on the application of key radiation protection principles is often missing, incomplete or inadequate. While mention is normally made of the basic principles of optimization of protection, under constraint, and dose limitation for practices, the guidance often stops at that. The principle of optimization of protection is powerful in that it has been effective in reducing doses but its application involves judgements and guidance on how this principle is applied. Similarly, the establishment of dose (and risk) constraints and reference levels requires judgement. Recommendations on numerical values have been provided by the International Commission on Radiological Protection (ICRP). Guidance is needed on how to establish and implement numerical values for dose constraints and reference levels.

Since there is currently no Safety Guide dealing generically with radiation protection of the public and environment, the revision of existing Safety Guides could not adequately and comprehensively address the needs that have been identified

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

This is a generic Safety Guide, paralleling the proposed Safety Guide on occupational radiation protection. It would fall within the thematic areas of radiation protection, waste and environmental safety and provide guidance on the requirements given in the revised BSS. Its

intention is to underpin the specific guidance on the application of the Safety Principles of SF-1 and requirements of the revised BSS in the relation to protection of the public and environment in all relevant Safety Guides. It would be based on relevant recommendations from ICRP.

Thus, this Safety Guide will interface with the following Safety Standards (this is not and cannot be regarded as an exclusive list):

1. EUROPEAN ATOMIC ENERGY COMMUNITY, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANIZATION, INTERNATIONAL MARITIME ORGANIZATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, UNITED NATIONS ENVIROMENT PROGRAMME, WORLD HEALTH ORGANIZATION, Fundamental Safety Principles, Safety Standards Series No. SF-1, IAEA, Vienna (2006).

2. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANISATION, NUCLEAR ENERGY AGENCY OF THE ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, PAN AMERICAN HEALTH ORGANIZATION, WORLD HEALTH ORGANIZATION, International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (1996).

3. INTERNATIONAL ATOMIC ENERGY AGENCY, Legal and Governmental Infrastructure for Nuclear, Radiation, Radioactive Waste and Transport Safety, GS-R-1, (2000).

4. INTERNATIONAL ATOMIC ENERGY AGENCY, Preparedness and Response for a Nuclear or Radiological Emergency, GS-R-2, (2002).

5. INTERNATIONAL ATOMIC ENERGY AGENCY, Regulations for the Safe Transport of Radioactive Material, TS-R-1, (2009).

6. INTERNATIONAL ATOMIC ENERGY AGENCY, Regulatory Control of Radiation Sources, GS-G-1.5, (2004).

7. INTERNATIONAL ATOMIC ENERGY AGENCY, Justification of Practices, DS401.

8. INTERNATIONAL ATOMIC ENERGY AGENCY, Application of the Concepts of Exclusion, Exemption and Clearance, RS-G-1.7 (2004).

9. INTERNATIONAL ATOMIC ENERGY AGENCY, Decommissioning of Facilities Using Radioactive Material, WS-R-5 (2006).

10. INTERNATIONAL ATOMIC ENERGY AGENCY, Predisposal Management of Radioactive Waste, GSR 5 (2009)

11. INTERNATIONAL ATOMIC ENERGY AGENCY, Regulatory Control of Radioactive Discharges to the Environment, WS-G-2.3 (2000).

12. INTERNATIONAL ATOMIC ENERGY AGENCY, Environmental and Source Monitoring for Purposes of Radiation Protection, RS-G-1.8 (2005).

13. INTERNATIONAL ATOMIC ENERGY AGENCY, Management of Radioactive Waste from the Mining and Milling of Ores, WS-G-1.2 (2002).

14. INTERNATIONAL ATOMIC ENERGY AGENCY, Radiation Protection and Radioactive Waste Management in the Operation of Nuclear Power Plants, NS-G-2.7 (2002).

15. INTERNATIONAL ATOMIC ENERGY AGENCY, Management of Waste from the Use of Radioactive Material in Medicine, Industry, Agriculture, Research and Education, WS-G-2.7 (2005).

16. INTERNATIONAL ATOMIC ENERGY AGENCY, Release of Sites from Regulatory Control upon Termination of Practices, WS-G-5.1 (2006).

17. INTERNATIONAL ATOMIC ENERGY AGENCY, Remediation of Areas Contaminated by Past Activities and Accidents, WS-R-3 (2003).

18. INTERNATIONAL ATOMIC ENERGY AGENCY, Remediation Process for Areas Affected by Past Activities and Accidents, WS-G-3.1 (2007).

19. INTERNATIONAL ATOMIC ENERGY AGENCY, Criteria for Use in Planning Response to Nuclear and Radiological Emergencies, DS44.

20. INTERNATIONAL ATOMIC ENERGY AGENCY, Protection of the Public against Exposure to Natural Sources of Radiation, DS421.

21. INTERNATIONAL ATOMIC ENERGY AGENCY, Radiological Environmental Analysis for Facilities and Activities, DS427.

6. OVERVIEW

This Safety Guide will cover the protection of the public and environment in all exposure situations – planned, emergency and existing. It will aim to clarify the application of the principles of protection for each of these situations – the role of radiation protection of the public and environment in the justification process; the meaning and application of the principle of optimization relating to normal and potential exposures; the role of dose and risk constraints; the role of reference levels.

7. PRODUCTION SCHEDULE:

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

Approval of DPP by the Coordination Committee	May 2009
Approval of DPP by the all Safety Standards Committees	June-July-October 2009
Approval of DPP by the CSS	March 2010
Approval of draft by the Coordination Committee	April 2011
Approval by the Safety Standards Committees for submission to Member States for comments	July 2011

Approval of the revised draft by the Coordination Committee	April 2012
Approval by the Safety Standards Committees for submission to the CSS	June 2012
Endorsement by the CSS	October 2012
Submission to Publications Committee	November 2012
Target publication date	April 2013

8. RESOURCES

1 CM during 2009
2 CMs during 2010
1 CM during 2011
1 CM during 2012

ANNEX

Proposed Table of Contents (environment to be taken into consideration at all steps of the content)

1. Introduction
    a. Background
    b. Objective
    c. Scope
    d. Structure

2. Framework for Protection of Public and Environment
    a. Exposure situations
    b. Dosimetric Quantities
    c. Dose Assessment

3. Planned Exposure Situations
    a. Radiation Protection Principles
    b. Administrative Requirements
    c. Application of Radiation Protection Principles

4. Emergency exposure situations
    a. Radiation Protection Principles
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5. Existing exposure situations
    a. Radiation Protection Principles
    b. Application of Radiation Protection Principles