

Document Preparation Profile (DPP)

Draft 2 dated 28 June 2013

1. IDENTIFICATION

Document Category **Specific Safety Requirements**

Working ID: **DS478**

Proposed Title: **Safety of Fuel Cycle Facilities**

Proposed Action: **Revision of Safety Requirements NS-R-5: Safety of Fuel Cycle Facilities (2008)**

Review Committee(s) or Group: **All (Leading Committee, NUSSC), NSGC**

Technical Officer(s): **A. M. Shokr, RRSS/NSNI**

2. BACKGROUND

The Safety Requirements document NS-R-5 on the Safety of fuel cycle facilities was published in 2008. This document established requirements for all aspects of fuel cycle facility safety with particular emphasis on requirements for design and operation. NS-R-5 also included requirements on fuel cycle facilities regulatory supervision, management and verification of safety, site evaluation, construction, commissioning, and decommissioning.

The main objective of the NS-R-5 was to provide a basis for safety and a basis for safety assessment for all stages in the lifetime of a fuel cycle facility, and to establish safety requirements on aspects relating to regulatory supervision, management of safety, site evaluation, design, construction, commissioning, operation and decommissioning of fuel cycle facilities.

The requirements established by the NS-R-5 apply to fuel cycle facilities of all types and sizes, fuel cycle facilities for processing, refining, conversion, enrichment, fabrication of fuel (including MOX fuel), spent fuel storage, spent fuel reprocessing and associated waste conditioning and storage, and fuel cycle research and development facilities. Facilities for mining and milling of ores are not covered by the scope of the NS-R-5.

3. JUSTIFICATION FOR THE PRODUCTION OF THE DOCUMENT

The revision of the NS-R-5 is initiated in the frame of the Roadmap described in the long term structure of safety standards “Strategies and Processes for the Establishment of IAEA Safety Standards – SPESS” which was approved by the IAEA Member States in 2008. SPESS imposes that the IAEA safety requirements shall be governed by the objective and principles of the Safety Fundamentals publication (SF-1).

A number of safety standards, including General Safety Requirements, have been published since the publication of the NS-R-5 in 2008. Other General Safety Requirements, which have interface with one or more areas important to the safety of fuel cycle facilities, are currently under development. The revision of the NS-R-5 is required to ensure the coherency and consistence of its technical contents with the other relevant IAEA Safety Standards. The revision of the NS-R-5 will also take into account the experience acquired by the IAEA and Member States from its application. Furthermore, the

revised version will be an opportunity to incorporate the relevant feedback from the accident at the Fukushima-Daiichi nuclear power plant.

4. OBJECTIVE AND SCOPE

The objective of the revised version of the NS-R-5 is to provide a basis for safety and a basis for safety assessment for all stages in the lifetime of fuel cycle facility with particular emphasis on requirements for design, construction, commissioning, operation and decommissioning. For the benefits of the end-users (mainly from Member States operating fuel cycle facilities with small or no nuclear power programme), the revised version will also include safety requirements on aspects relating to regulatory supervision, management of safety, site evaluation, of fuel cycle facilities.

The original scope of the NS-R-5 will be kept for the revised version. The scope of the revised NS-R-5 will cover fuel cycle facilities of all types and sizes, including facilities for processing, refining, conversion, enrichment, fabrication of fuel (including MOX fuel), spent fuel storage, spent fuel reprocessing and associated waste conditioning and storage, and fuel cycle research and development facilities. Facilities for mining and milling of ores are not in the scope of the revised version of NS-R-5.

The revised NS-R-5 is intended for use by organizations engaged in the site evaluation, design, construction, commissioning, operation, and decommissioning of fuel cycle facilities as well as by regulatory bodies.

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

The document will be a Specific Safety Requirements for Fuel Cycle Facilities. This document will interface with the following publications:

1. Fundamental Safety Principles, IAEA Safety Standards Series No. SF-1, (2006);
2. Governmental, Legal and Regulatory Framework for Safety, IAEA Safety Standards Series No. GSR Part 1, (2010);
3. DS457: Preparedness and Response for a Nuclear or Radiological Emergency Safety Requirements, (Revision of the GS-R-2);
4. DS 456: Leadership and Management of Safety (Revision of the GS-R-3);
5. Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards - IAEA Safety Standards Series No. GSR Part 3, (Interim Edition 2011);
6. Safety Assessment for Facilities and Activities, GSR Part 4, (2009);
7. Predisposal Management of Radioactive Waste GSR Part 5, (2009);
8. DS450: Decommissioning and Termination of Activities (Revision of the WS-R-5);
9. Site evaluation for Nuclear Installations, IAEA Safety Standards Series, No NS-R-3, 2003;
10. DS462: Revision through addenda of GSR- Part 1, NS-R-3, SSR-2/1, SSR-2/2 and GRS Part 4;
11. Strengthening the Global Nuclear Safety Regime, INSAG-21, 2006;
12. The Interface between Safety and Security at Nuclear Power Plants, INSAG-24 (2010);
13. Regulations for the Safe Transport of Radioactive Material, IAEA Safety Standards Series No. SSR-6, 2012.
14. Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities(INFCIRC/225/Revision 5)

6. OVERVIEW

The table of contents is as follows:

1. INTRODUCTION

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OBJECTIVE

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2. APPLYING SAFETY OBJECTIVE, PRINCIPLES AND CONCEPTS

SAFETY OBJECTIVE

SAFETY PRINCIPLES

CONCEPT OF DEFENCE IN DEPTH

3. LEGAL FRAMEWORK AND REGULATORY SUPERVISION

LEGISLATIVE AND REGULATORY INFRASTRUCTURE

REGULATORY BODY

LICENSING PROCESS

Safety Analysis Report and other licensing documentation

Review and assessment by the regulatory body

Acceptance criteria

INSPECTION AND ENFORCEMENT

4. MANAGEMENT AND VERIFICATION OF SAFETY

INTEGRATED MANAGEMENT SYSTEM

VERIFICATION OF SAFETY

5. SITE EVALUATION

INITIAL EVALUATION AND SELECTION OF THE SITE

MONITORING OF HAZARDS

REASSESSMENT OF THE SITE

6. DESIGN

PRINCIPAL TECHNICAL REQUIREMENTS

Fundamental safety functions

Radiation protection

Application of the defence in depth

Proven engineering practices

Safety assessment

Provisions for construction

Features for facilitating radioactive waste management and decommissioning

GENERAL REQUIREMENTS FOR DESIGN

Classification of Structures, Systems, and Components

Codes and Standards

- Design Basis
- Design for extension conditions
- Design for reliability
- Design for criticality prevention
- Human factors and ergonomics
- Ageing management
- Design for commissioning
- Provisions for maintenance, testing and inspection
- Design for emergency planning
- Provisions for modification
- Design for decommissioning
- Non-radiological hazards
- Safety analysis

SPECIFIC REQUIREMENTS FOR DESIGN

- Buildings and structures
- Means of confinement
- Process systems
- Fuel handling and storage systems
- Radiation protection
- Radioactive waste
- Instrumentation and Control systems
- Electrical systems
- Supporting and auxiliary systems

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8. COMMISSIONING COMMISSIONING PROGRAMME COMMISSIONING STAGES AND TESTS COMMISSIONING PROCEDURES AND REPORTS

9. OPERATION

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- Responsibilities of the operating organization
- Operating personnel
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EMERGENCY PLANNING AND PREPAREDNESS

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RADIOACTIVE WASTE MANAGEMENT

AGEING MANAGEMENT AND PERIODIC SAFETY REVIEW

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7. PRODUCTION SCHEDULE:

| | A* | B* | C* |
|--|------------------------|------|------|
| STEP 1: Preparing a DPP | DONE | DONE | DONE |
| STEP 2: Approval of DPP by the Coordination Committee | July 2013 | | |
| STEP 3: Approval of DPP by the relevant review Committees | 4 th Q 2013 | | |
| STEP 4: Approval of DPP by the CSS | 1 st Q 2014 | | |
| STEP 5: Preparing the draft | 4 th Q 2014 | | |
| STEP 6: Approval of draft by the Coordination Committee | 1 st Q 2015 | | |
| STEP 7: Approval by the relevant review Committees for submission to Member States for comments | 2 nd Q 2015 | | |
| STEP 8: Soliciting comments by Member States | 4 th Q 2015 | | |
| STEP 9: Addressing comments by Member States | 4 th Q 2015 | | |
| STEP 10: Approval of the revised draft by the Coordination Committee Review in NS-SSCS | 4 th Q 2015 | | |
| STEP 11: Approval by the relevant review Committees for submission to the CSS | 2 nd Q 2016 | | |
| STEP 12: Endorsement by the CSS | 3 rd Q 2016 | | |
| STEP 13: Establishment by the Publications Committee and/or Board of Governors (for SF and SR only)) | 1 st Q 2017 | | |
| STEP 14: Target publication date | 3 rd Q 2017 | | |

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- *Column A for Safety Fundamentals, Safety Requirements and Safety Guides.*
- *Column B for Nuclear Security Series publications noting that for Technical Guides a fast track may be proposed and justified for approval by the NSGC at step 3. If approved, the draft will not be subject to the steps 4 to 10 and, be provided at step 11 to the NSGC to take note of it before its publication*
- *Column C for TECDOCs, safety reports and other publications*

8. RESOURCES

Secretariat: P staff (12 Man weeks) + 3 CSM (15 Man-weeks of non-staff)

