

Document Preparation Profile (DPP)

1. IDENTIFICATION

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Proposed Title: Risk-Informed Decision Making

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SS Committee(s): NUSSC

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2. OBJECTIVE

With continually increasing use of Probabilistic Safety Assessment (PSA) to provide complementary insight, perspective, comprehension, and balance to deterministic nuclear reactor safety assessment, there is an immediate need to establish high level international standards for Risk-Informed Decision-Making (RIDM).

This Safety Guide will publish, from the spectrum of developed or developing RIDM methods, an international RIDM consensus approach for Member Country nuclear reactor licensees, operators, support organizations, and regulators. The Safety Guide is intended to apply in harmony with the full series of IAEA Safety Standards for safety assessment and verification and to convey optimum approaches to enhance nuclear reactor safety.

This Safety Guide is not intended to preclude the use of new or alternative methods. While the details of methods change with better understanding, the framework of this Safety Guide is expected to apply for the foreseeable future.

3. BACKGROUND

There is general international agreement, as reflected in various IAEA Safety Standards for nuclear reactor design and operation (listed below in Section 4), that both deterministic and probabilistic analyses provide insights, perspective, comprehension, and balance to reactor safety. Accordingly, the spectrum of applications for the blend of these approaches continues to increase. Such applications support design, construction, licensing, operation, inspection, and oversight. Additionally, there is evidence that applications to physical security are already being considered in some Member Countries. A key to the success of RIDM relates to how the information is integrated. Therefore, this Safety Guide will focus on how to perform Risk-Informed, Integrated Decision Making in order to arrive at sound decisions.

4. INTERFACES

The proposed Safety Guide is one of a number of Safety Guides supporting the new Safety Requirements document on safety assessment and verification for nuclear facilities (DS348). Safety Guides are being developed such that guidance for safety assessment and verification is consistent and coherent within itself and with existing guidance for design and operation. The set of Safety Guides includes, among others, draft Safety Guides DS394 and DS393 on Level 1 and Level 2 PSA and related applications. Neither these Safety Guides nor the Safety Guide on RIDM includes details of modelling methods. Such methods are documented in other relevant literature. Accordingly, the Safety Guide on RIDM will be used jointly and consistently with other Safety Guides, particularly the others planned on PSA along with those on deterministic analysis and safety goals. The RIDM Safety Guide is technology neutral.

This new Safety Guide will interface with:

- INSAG-12: Basic Safety Principles for Nuclear Power Plants, 75-INSAG-3 Rev. 1, Vienna, 1999
- Safety of Nuclear Power Plants: Design, IAEA Safety Standards Series No. NS-R-1, IAEA, Vienna, 2000
- Safety of Nuclear Power Plants: Operation, IAEA Safety Standards Series No. NS-R-2, IAEA, Vienna, 2000
- Operational Limits and Conditions and Operating Procedures for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-2.2, IAEA, Vienna, 2000
- Safety Requirement: Safety Assessment and Verification for Nuclear Facilities (DS 348)
- Safety Assessment and Verification for Nuclear Power Plants, Safety Standards Series No. NS-G-1.2, IAEA, Vienna, 2002
- Periodic Safety Review of Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-2.10, IAEA, Vienna, 2003
- Format and Content of the Safety Analysis Report for Nuclear Power Plants, IAEA Safety Standards Series No. GS-G-4.1, IAEA, Vienna, 2004
- A Framework for a Quality Assurance Programme for PSA, IAEA-TECDOC-1101, IAEA, Vienna, 1999
- Development and Application of Level 1 PSA for Nuclear Reactors, Safety Guide, DS394 (in preparation)
- Procedures for Conducting Probabilistic Safety Assessments of Nuclear Power Plants (Level 1), Safety Series No. 50-P-4, IAEA, Vienna, 1992
- Development and Application of Level 2 PSA for Nuclear Power Plants, Safety Guide, DS393 (in preparation)

- Procedures for Conducting Probabilistic Safety Assessments of Nuclear Power Plants (Level 2): Accident Progression, Containment Analysis and Estimation of Accident Source Terms, Safety Series No. 50-P-8, IAEA, Vienna, 1995
- Procedures for Conducting Probabilistic Safety Assessments of Nuclear Power Plants (Level 3), Safety Series No. 50-P-12, IAEA, Vienna, 1996
- Living Probabilistic Safety Assessment (LPSA), IAEA-TECDOC-1106, IAEA, Vienna, 1999
- Treatment of Internal Fires in Probabilistic Safety Assessment for Nuclear Power Plants, Safety Reports Series No. 10, IAEA, Vienna, 1998
- Extreme External Events in the Design and Assessment of Nuclear Power Plants, IAEA-TECDOC-1341, IAEA, Vienna, 2003
- Treatment of External Hazards in Probabilistic Safety Assessment for Nuclear Power Plants: A Safety Practice, Safety Series No. 50-P-7, IAEA, Vienna, 1995
- Probabilistic Safety Assessment for Seismic Events, IAEA-TECDOC-724, IAEA, Vienna, 1993
- Probabilistic Safety Assessments of Nuclear Power Plants for Low Power and Shutdown modes, IAEA-TECDOC-1144, IAEA, Vienna, 2000
- Applications of Probabilistic Safety Assessment (PSA) for Nuclear Power Plants, IAEA-TECDOC-1200, IAEA, Vienna, 2000
- Review of Probabilistic Safety Assessments by Regulatory Bodies, Safety Report Series No. 25, IAEA, Vienna, 2002
- Regulatory Review of Probabilistic Safety Assessment (PSA) Level 2, IAEA-TECDOC-1229, Vienna, 2001
- Risk informed regulation of nuclear facilities: Overview of the current status, IAEA-TECDOC-1436, IAEA, Vienna, 2005
- Use of PSA Level 2 Analysis for Improving Containment Performance, IAEA-TECDOC-1002, Vienna, 1998
- Implementation of Accident Management Programmes in Nuclear Power Plants, IAEA Safety Reports Series No.32, Vienna, 2004.
- Safety of Research Reactors Safety Requirements, Safety Standards Series No. NS-R-4, IAEA, Vienna, 2005
- Safety of New and Existing Research Reactor Facilities in Relation to External Events, Safety Reports Series No. 41, IAEA, Vienna, 2005
- Safety Considerations for Research Reactors in Extended Shutdown, IAEA-TECDOC-1387, IAEA, Vienna, 2004
- Use of graded approach in the application of the safety requirements for research reactors, DS351 (Draft)
- Safety of Fuel Cycle Facilities – Safety Requirements, DS316 (Draft)
- Safety Requirements: “Management Systems”, DS338 (in preparation)

- EPRI Risk Management Guidelines (in preparation)
- An Approach For Using Probabilistic Risk Assessment In Risk-Informed Decisions On Plant-Specific Changes To The Licensing Basis, U.S. Nuclear Regulatory Commission Regulatory Guide 1.174, Revision 1, 2002
- An Approach For Plant-Specific Risk-Informed Decision Making: Technical Specifications, U.S. Nuclear Regulatory Commission Regulatory Guide 1.177, 1998
- Risk Monitors, The State of the Art in their Development and Use at Nuclear Power Plants, IAEA and OECD/NEA WG Risk, to be issued by IAEA
- Integrated Risk-Informed Decision-Making Process for Emergent Issues, U.S. Nuclear Regulatory Commission, NRR Office Instruction, LIC-504, 2005
- Basic Safety Rule on PSA, France
- “Report on the regulatory experience of risk-informed in-service inspection of nuclear power plant components and common views, NRWG, Task Force on risk-informed in-service inspection, EUR 21320 EN, 2004.

5. OVERVIEW

The proposed Safety Guide will conform to the style requirements for standard safety series documents. The proposed Table of Contents is presented at the end of the DPP.

6. PRODUCTION: Provisional schedule for preparation of the document:

Steering Committee Approve DPP	2006 February
NUSSC Approve DPP	2006 March
CSS Approve DPP	2006 April
Development:	
• Initial Framework	2006 May
• CS Prepare 1 st draft	2006 June
• TM Comment on 1 st draft	2006 September
• CS Prepare 2 nd draft using TM comments	2006 December
Steering Committee Approve draft	2007 February
NUSCC Approve draft submittal to Member States for comments	2007 May
Revise draft considering Member States’ comments	2007 June
Steering Committee Approve Revised Draft	2007 July
NUSSC Approve draft submittal to the CSS; Editing	2008
CSS Endorse	2008
Submission to the Publications Committee	2008
Target Publication Date	2008

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