

## Explanatory Note

### *Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants (DS528)*

The draft text for review, entitled *Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants*, was prepared as a draft Safety Guide to be issued in the IAEA Safety Standards Series.

The draft text has already been reviewed through consultants' meetings, as well as by the Nuclear Safety Standards Committee (NUSSC).

The objectives of this draft text, as accepted by the Commission on Safety Standards (CSS), are to provide recommendations for meeting the requirements of IAEA Safety Standards Series Nos GSR Part 4 (Rev. 1), *Safety Assessment for Facilities and Activities*, SSR-2/1 (Rev. 1), *Safety of Nuclear Power Plants: Design*, and SSR-2/2 (Rev. 1), *Safety of Nuclear Power Plants: Commissioning and Operation*, regarding the development and application of Level 2 probabilistic safety assessment (PSA) for nuclear power plants (NPPs) and to complement the recommendations provided in the Safety Guide on Level 1 PSA (SSG-3 (Rev. 1) (DS523)), currently in preparation. This draft Safety Guide also aims at promoting technical consistency among Level 2 PSA studies and their application to risk informed decision making in Member States. In particular, it aims at providing recommendations to support:

- (a) Comparison of results of the Level 2 PSA with probabilistic safety goals or criteria, if these have been set, to assess the overall level of safety of the plant;
- (b) Evaluation of plant design to identify potential vulnerabilities in the mitigation of severe accidents;
- (c) Development of severe accident management guidelines that can be applied following fuel damage;
- (d) Provision of source terms as input into emergency planning;
- (e) Use of the source terms and frequencies as input data to assess off-site consequences;
- (f) Prioritization of research relating to severe accident issues;
- (g) Use of a range of other PSA applications in combination with the Level 1 PSA results and insights;
- (h) More detailed considerations to address the combination of hazards.

In addition, this draft Safety Guide provides a standard framework to facilitate a regulatory review or peer review of Level 2 PSA and its various applications.

This draft text is a revision of IAEA Safety Standards Series No. SSG-4, *Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants*. The revised Safety Guide is intended for use by designers, operating organizations, technical support organizations and regulatory bodies in the development, application and independent review of Level 2 PSA. The revised Safety Guide is also intended for use in connection with both the review for authorization (licensing) of the construction and the operation of new NPPs and the safety re-evaluation of existing NPPs during periodic safety reviews and modifications.

Comments are requested in relation to:

- Relevance and usefulness: Are the stated objectives appropriate, and are they met by the draft text?
- Scope and completeness: Is the scope appropriate, and is it adequately covered by the draft text?
- Quality and clarity: Does the guidance in the draft text represent the current consensus among specialists in the field, and is this guidance expressed clearly and coherently?

Comments of an editorial nature will be considered; however, it should be noted that the draft text will be comprehensively edited by the IAEA Secretariat.

Any comments should be made in English, should refer to the relevant paragraph number in the draft text being reviewed, and should propose alternative text where appropriate. Please use the attached Form for Comments to record all comments.

The responsible IAEA officer is Mr Jorge Luis Hernandez of the Department of Nuclear Safety and Security, who may be contacted for further information in connection with this subject by telephone at: +43 1 2600 24568 or via email at: [J.Luis-Hernandez@iaea.org](mailto:J.Luis-Hernandez@iaea.org)

Any comments should be sent through the established official channels to the responsible IAEA officer by ***13 November 2023***.

**Form for Comments**  
*Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants (DS528)*

COMMENTS BY REVIEWER				RESOLUTION			
Reviewer:				Page.... of....			
Country/Organization:				Date:			
Comment No.	Para/Line No.	Proposed new text	Reason	Accepted	Accepted, but modified as follows	Rejected	Reason for modification/rejection

## Statement by the Commission on Safety Standards

Publications in the IAEA Safety Standards Series are prepared and reviewed in accordance with a uniform process. To this end, the Commission on Safety Standards (CSS) and five committees with harmonized terms of reference — the Emergency Preparedness and Response Standards Committee (EPRaSC), the Nuclear Safety Standards Committee (NUSSC), the Radiation Safety Standards Committee (RASSC), the Transport Safety Standards Committee (TRANSSC) and the Waste Safety Standards Committee (WASSC) — have been established. The CSS has a special overview role with regard to the IAEA's safety standards and provides advice to the Director General on the IAEA's overall programme with regard to regulatory aspects of safety.

The uniform preparation and review process involves organizing expert group meetings; arranging at different stages of preparation for the internal review of draft texts; submitting the texts to the relevant Committee(s) for review; submitting draft texts to the IAEA's Member States for comment; and submitting the approved final draft of the safety standard<sup>1</sup> for endorsement by the CSS before publication.

The CSS stresses the importance of Member States' comments to the preparation and review process for safety standards. Publications in the IAEA Safety Standards Series not only should be of the requisite quality but also should represent the consensus view of the Member States and should address the issues of importance to the Member States. While the CSS, the Committees and the Secretariat strive to provide safety standards that satisfy these criteria, the review of draft standards by experts in the Member States is an essential stage in obtaining the broadest possible technical consensus and the highest possible quality and relevance.

Member States are also encouraged to provide the IAEA with feedback on their use of the safety standards. The status of safety standards extant and in preparation can be seen on the IAEA's website, where there are also links to electronic files for existing publications, including those in other official languages.<sup>2</sup> The responsible IAEA officer is Mr Dominique Delattre, Head of the Safety and Security Publications Unit of the Department of Nuclear Safety and Security. He may be contacted for further information in connection with this subject by telephone at: + 43 1 2600 22696 or via email at: [D.Delattre@iaea.org](mailto:D.Delattre@iaea.org).

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<sup>1</sup> Safety Guides are published under the authority of the Director General. Safety Fundamentals and Safety Requirements publications require the approval of the Board of Governors, after endorsement by the CSS.

<sup>2</sup> See <http://www-ns.iaea.org/committees/files/CSS/205/status.pdf>.