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1. IDENTIFICATION

Document Category: Specific Safety Guide

Working ID: DS570

Proposed Title: **Safety Classification of Structures, Systems and Components in Nuclear Power Plants**

Proposed Action: **Revision of SSG-30 (2014)**

Review Committee(s) or Group: NUSSC, TRANSSC, NSGC

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2. BACKGROUND

IAEA Specific Safety Guide No. SSG-30, Safety Classification of Structures, Systems and Components in Nuclear Power Plants, (hereinafter referred to as SSG-30) was published in 2014. SSG-30 provides guidance on the methodology for identifying and classifying SSCs important to safety in nuclear power plants (NPPs) on the basis of their functions and safety significance to meet Requirement 22 and associated paragraphs on safety classification established in IAEA Safety Standards Series No. SSR-2/1 (Rev. 1, 2016).

Consequently, the safety classification of structures, systems and components (SSCs) aims to ensure that the SSCs are designed, manufactured, installed, tested, inspected, maintained and operated using established processes, such that their reliability and quality are commensurate with their safety significance. As a fundamental cross-cutting aspect of nuclear power plant design, safety classification is essential for ensuring plant safety while supporting the effective and balanced application of design requirements.

Since the publication of the SSG-30 in 2014, feedback from Member States indicates that the guidance on the safety classification methodology should be expanded to enable designers and regulators to align on engineering standards appropriate for various safety classes for different reactor technologies. This is particularly important as significant developments have been made on advanced nuclear reactor designs, including non-water-cooled reactor (NWCR) technologies and small modular reactors (SMRs), moving toward broader deployment. These advanced NPPs differ from traditional water-cooled reactors (WCRs), incorporating innovative design features and enabling a wide range of applications, including electricity generation and other uses. Key distinguishing features of NWCR designs include different neutron spectra, alternative coolants and moderators, and novel fuel types. Other important features are related to siting conditions such as remote locations and operation, highly populated areas,

proximity to industrial facilities and underground installation, modularity[1] and modularization[2], different power outputs and transportable NPPs[3] (TNPPs), including propulsion (such as nuclear merchant ships).

While these innovations are claimed to offer potential safety and operational benefits, they also introduce new challenges related to the reliability, capability and functionality of SSCs for NPPs.

A complete feedback analysis is provided in the Annex.

3. JUSTIFICATION FOR THE PRODUCTION OF THE PUBLICATION

For several years, IAEA General Conference resolutions on nuclear and radiation safety have requested the IAEA Secretariat to update the Safety Standards to incorporate specifics of advanced reactors technologies and designs[4], included in both NPPs with NWCR technologies and NPPs with WCR designs.

Safety Report Series 123, Applicability of IAEA Safety Standards to Non Water Cooled Reactors and Small Modular Reactors, published in 2023, notes that SSG-30 was developed with a technology-neutral approach. However, feedback from Member States indicates challenges in its application for all NPP designs and technology. Furthermore, SSG-30 has been used in relevant IAEA review services such as technical safety reviews (TSRs) on design safety, and lessons learned from different missions allowed IAEA to accumulate feedback on the application of SSG-30 by Member States and to identify specific areas for further enhancement, underscoring the need for additional guidance particularly regarding the application of engineering rules to classified SSCs.

The revision of SSG-30 will explore innovative approaches to safety classification and incorporate lessons learned by Member States. For example, since its publication in 2014, risk-informed approaches to SSCs classification have been developed for both existing and advanced reactors, including small modular reactors (SMRs). Additionally, as commercial-grade components are increasingly being considered for new projects and for existing plants, the revision of SSG-30 should therefore consider incorporating recommendations on how these may be used as components important to safety without degrading nuclear safety.

While the revision of SSG-30 will strive to keep a technology-neutral philosophy for the safety classification process of SSCs, there is a need to improve existing recommendations or develop new ones as needed, and to increase their clarity and applicability to support:

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[1] Modularity is understood as the possibility for the subsequent placing of small modular reactor (SMR) modules (i.e. reactor modules) close to each other in one NPP (TECDOC-2010).

[2] Modularization is the possibility to assemble several SSCs of the NPP in the manufacturing factory, thereby facilitating subsequent transport / relocation of such assembled modules to the site and the construction of the reactor module on site (TECDOC-2010).

[3] Transportable NPP (TNPP) is defined in a footnote of DPP562 for revision 2 of SSR-2/1 (Rev.1) and reproduced here. It is an NPP designed to be geographically relocated as complete, or nearly complete, system. Some of such NPPs may utilize modularization for ease of assembly and deployment but are not physically attached to a transport platform during operation. These NPPs are relocated and installed at the site, however they are not designed for energy utilization during the relocation phase. Other NPPs are integrated with and remain attached to a transport platform, such as truck, or integrated with a ship, or barge, allowing the entire plant to be relocated and operated from the transport platform (or ship or barge) itself, such as floating NPPs. In this category, some NPPs (including nuclear merchant ships) may use the produced energy for propulsion. The definition is not final and will be refined during the drafting process, in close collaboration with DS562.

[4] Advanced reactors technologies and designs refer to the terminology established in NT-T-1.19.

(a) Consideration in the design basis of SSCs in NPPs to prevent accidents and mitigate their consequences, ensuring the highest level of safety reasonably achievable;

(b) The implementation of the defence in depth concept in NPP design, ensuring that the independence between the different levels of defence, and the barriers considered at such levels, is achievable, demonstrable and maintained as far as reasonably practicable;

(c) An appropriate balance between prevention and mitigation in the design to ensure the fundamental safety functions, taking into account all safety features, including inherent safety features;

(d) Adequate safety margins to account for uncertainties and to avoid cliff-edge effects to ensure reliable performance within different plant states;

(e) The concept of practical elimination in the design of nuclear power plants to prevent plant event sequences that could lead to early radioactive releases or large radioactive releases, ensuring that they are either physically impossible or that they could be considered with high level of confidence to be extremely unlikely to arise.

Therefore, in connection with the ongoing revision of SSR-2/1 (Rev. 1) under DS562, which aims to incorporate design features of advanced reactor concepts and lessons learned from operating NPPs, it is both timely and logical to revise the associated safety guides within the scope of design. This includes updating SSG-30 to reflect current practices in the classification of SSCs.

4. OBJECTIVE

The objective of the revision of SSG-30 is to provide recommendations for the identification of SSCs important to safety and essential for the safe operation of NPPs, and for their classification on the basis of their functions and safety significance. This revision will be informed by experience and feedback on the application of safety classification of SSCs to WCRs and NWCRs, including TNPPs. This includes SSCs necessary for preventing or mitigating events that could compromise safety.

The revision will address the selection of appropriate engineering design rules for SSCs, including the identification of interfaces and the implications of assigning safety classes across other classification schemes (such as seismic and fire). This work will take into account the evolving technological landscape, ensuring that engineering design and construction rules remain appropriately graded for all types of SSCs.

The revision will consider recommendations to address the implications of the safety classification of SSCs in the context of the increasing use of commercially manufactured components in the nuclear industry, including any additional qualification, commercial-grade dedication, or quality assurance measures that may be required commensurate with their safety significance.
Interfaces with transport classification frameworks applicable to platforms for TNPPs will be considered in the revision, ensuring close alignment with the TNPP-specific developments being incorporated into DS562.

Moreover, consideration will be provided to the interfaces between safety and security, and safety and safeguards from the early stages of NPP design. This proactive approach will strengthen defence in depth and minimize the need for later modifications or backfitting to comply with the relevant requirements related to those topics.

This Safety Guide is intended for use by designers, operating organizations, technical support

organizations, and regulatory bodies in the development, application, and independent review of the safety classification of SSCs as part of the authorization (licensing) process for the design, manufacture, construction, modification, maintenance, relocation, commissioning, operation, and decommissioning of NPPs employing reactor technologies within the scope of the safety guide.

For existing NPPs (whether land-based, floating, or used for propulsion) that are already in operation or under construction, it might not be practicable to apply all the new or revised recommendations of SSG-30 (Rev. 1). In addition, it might not be feasible to modify designs that have already been approved by regulatory bodies. In such cases, it is expected that comparisons will be made with the current IAEA Safety Standards[5] (such as during periodic safety reviews) to assess whether reasonably practicable safety improvements could be implemented to further enhance the safe operation of the plant.

5. SCOPE

SSG-30 applies to the design of all SSCs important to safety for all plant states, including all modes of normal operation, during the lifetime of an NPP.

The recommendations in SSG-30 are written in technology neutral terms, and this principle will be maintained throughout the revision. Therefore, the associated classification approach will remain applicable to all NPPs, including TNPPs, in line with the scope defined in the on-going revision of SSR-2/1 (Rev.1) under DS562[6].

The recommendations from this publication may also be applied, with judgement, to other types of nuclear installations, including research reactors and nuclear fuel cycle facilities, to address the relevant safety requirements on safety classification of SSCs.

Nuclear reactors for aviation or outer space applications, accelerator-driven systems and fusion installations will be out of scope in SSG-30 (Rev. 1).

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

During the revision process, appropriate consistency with the contents of all relevant Safety Standards will be maintained, in particular with those currently under revision or proposed to be revised, SSR-2/1 (Rev. 2, DS562), GSR Part 4 (Rev. 1, proposed to be revised), SSG-48 (DS561), SSG-52 (proposed to be revised), SSG-53 (proposed to be revised), SSG-56 (proposed to be revised), SSG-67 (DS563) and SSG-68 (DS564).

This Safety Guide falls within the thematic area of design safety and will interface with the following IAEA Safety Standards Series and other publications (the list is not intended to be final or exhaustive):

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[5] The current IAEA Safety Standards refer to the latest published versions of the documents.

[6] The revision under DS562 will expand the current scope in SSR-2/1 (Rev. 1) to consider all power producing nuclear reactors (e.g. electrical generation, process heat, desalination, marine propulsion) used for civil purposes and to integrate updated considerations for water-cooled (including advanced) and non-water-cooled reactor technologies (e.g. high temperature gas cooled reactors, liquid metal fast neutron reactors and molten salt reactors). In addition, specifics of NPPs with small modular reactors and micro reactor designs, and corresponding deployment options (e.g. NPP with multi module units (i.e. modularity), remote locations, underground installation, transportable NPPs (i.e. modularization and propulsion)), will be considered.

[1] SF-1 - Fundamental Safety Principles (2006);

[2] GSR-Part 4 (Rev.1) – Safety Assessment for Facilities and Activities (2016), proposed to be revised;

[3] GSR-Part 6 – Decommissioning of Facilities (2014);

[4] GSR-Part 7 - Preparedness and Response for a Nuclear or Radiological Emergency (2015);

[5] SSR-2/1 (Rev.1) – Safety of Nuclear Power Plants: Design (2016), under revision as DS562;

[6] SSR-2/2 (Rev.1) - Safety of Nuclear Power Plants: Commissioning and Operation (2016), under revision as DS532;

[7] SSR-3 – Safety of Research Reactors (2016);

[8] SSR-4 – Safety of Nuclear Fuel Cycle Facilities (2017);

[9] SSR-6 (Rev.2) – Regulations for the Safe Transport of Radioactive Material (2025);

[10] SSG-2 (Rev.1) – Deterministic Safety Analysis for Nuclear Power Plants (2019);

[11] SSG-3 (Rev.1) - Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants (2024);

[12] SSG-4 (Rev.1) - Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants (2025);

[13] SSG-25 - Periodic Safety Review for Nuclear Power Plants (2013) under revision as DS535;

[14] SSG-34 - Design of Electric Power Systems for Nuclear Power Plants (2016);

[15] SSG-38 - Construction for Nuclear Installations (2015);

[16] SSG-39 – Design of Instrumentation and Control Systems for Nuclear Power Plants (2016);

[17] SSG-48 – Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants (2018), under revision as DS561;

[18] SSG-52 - Design of the Reactor Core for Nuclear Power Plants (2019), proposed to be revised;

[19] SSG-53 - Design of the Reactor Containment and Associated Systems for Nuclear Power Plants (2019), proposed to be revised;

[20] SSG-56 - Design of the Reactor Coolant System and Associated Systems for Nuclear Power Plants (2020), proposed to be revised;

[21] SSG-61 - Format and Content of the Safety Analysis Report for Nuclear Power Plants (2021);

[22] SSG-62 - Design of Auxiliary and Supporting Systems for Nuclear Power Plants (2020);

[23] SSG-63 - Design of Fuel Handling and Storage Systems for Nuclear Power Plants (2020);

[24] SSG-64 - Protection against Internal Hazards in the Design of Nuclear Power Plants (2021);

[25] SSG-67 - Seismic Design for Nuclear Installations (2021), under revision as DS563;

[26] SSG-68 – Design of Nuclear Installations Against External Events Excluding Earthquakes (2021), under revision as DS564;

[27] SSG-69 - Equipment qualification for Nuclear Installations (2021);

[28] SSG-74 – Maintenance, Testing, Surveillance and Inspection in Nuclear Power Plants (2022);

[29] SSG-88 - Design Extension Conditions and the Concept of Practical Elimination in the Design of Nuclear Power Plants (2024);

[30] SSG-90 - Radiation Protection in the Design of Nuclear Power Plants (2024);

[31] Safety Demonstration of Innovative Technology in Power Reactor Designs, in development as DS537;

[32] IAEA Nuclear Safety and Security Glossary (2022);

[33] TECDOC-1787 - Application of the Safety Classification of Structures, Systems and Components in Nuclear Power Plants (2016);

[34] TECDOC-1910 - Quality Assurance and Quality Control in Nuclear Facilities and Activities (2020);

[35] TECDOC-1936 – Applicability of Design Safety Requirements to Small Modular Reactor Technologies Intended for Near Term Deployment – Light Water Reactors, High Temperature Gas Cooled Reactors (2020);

[36] TECDOC-2010 – Approach and Methodology for the Development of Regulatory Safety Requirements for the Design of Advanced Nuclear Power Reactors - Case Study on Small Modular Reactors (2022);

[37] TECDOC –2034 – Suitability Evaluation of Commercial Grade Products for Use in Nuclear Power Plant Safety Systems (2023);

[38] Safety Reports Series No 123 on the Applicability of IAEA Safety Standards to Non Water-Cooled Reactors and Small Modular Reactors (2023);

[39] Small Modular Reactors Regulators' Forum – Working Group on Design and Safety Analysis – Phase 2 Report (2021);

[40] Small Modular Reactors Regulators' Forum – Working Group on Design and Safety Analysis – Phase 3 Report – Containment Systems (2023);

[41] IEC 61226:2020, Nuclear power plants - Instrumentation, control and electrical power systems important to safety - Categorization of functions and classification of systems (2020).

Given the interfaces with the other IAEA publications listed above, the Safety Guide is planned to be developed in close cooperation across the Department of Nuclear Safety and Security, including the Incident and Emergency Centre, NSNI (EESS, OSS, RRSS), NSNS and NSRW, as well as in coordination with the Departments of Nuclear Energy and Safeguards (SGCP POC).

7. OVERVIEW

The recommendations in SSG-30 (Rev.1) will retain the overall structure and table of contents of the current SSG-30, while incorporating new sections, appendices and/or annexes to provide, if needed, specific details to cover various reactor technologies and their applications. The revised safety guide is expected to remain as technology-neutral or inclusive as possible.

The revision of SSG-30 will consider the methodology outlined and applied in TECDOC-2010 and TECDOC-1936, as well as the relevant findings presented in TECDOC-1787 and SRS-123 (see Annex).

The Safety Guide may therefore include the following contents (the contents may be adjusted during the development of the publication):

1. INTRODUCTION

   Background
   Objective
   Scope
   Structure

2. GENERAL APPROACH

   Basic Requirements
   General Recommendations
   Outline of the safety classification process

3. SAFETY CLASSIFICATION PROCESS

   Identification of functions to be categorized
   Identification of design provisions
   Categorization of functions
   Classification of structures, systems and components
   Interfaces with other classification schemes
   Verification of the safety classification
   Safety-security, safety-safeguards interfaces

4. SELECTION OF APPLICABLE ENGINEERING DESIGN RULES FOR STRUCTURES, SYSTEMS AND COMPONENTS

   Recommendations applicable to systems
   Recommendations applicable to individual structures or components

APPENDICES (if needed, for instance, to provide traceability and consistency of recommendations among different technologies and applications, or to further explain the interfaces between safety and security, or safety and safeguards)

REFERENCES

ANNEXES (IF NEEDED)

DEFINITIONS (IF NEEDED)

CONTRIBUTORS TO DRAFTING AND REVIEW

8. PRODUCTION SCHEDULE

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

	A*
STEP 1: Preparing a DPP	Q1 2026
STEP 2: Internal review of the DPP (Approval by the Coordination Committee)	Q3 2026
STEP 3: Review of the DPP by the review Committee(s) (Approval by review Committee(s))	Q4 2026
STEP 4: Review of the DPP by the CSS (approval by CSS) or information of the CSS on the DPP	Q1 2027
STEP 5: Preparing the draft publication	Q1 2027 - Q3 2028
STEP 6: First internal review of the draft publication (Approval by the Coordination Committee)	Q4 2028
STEP 7: First review of the draft publication by the review Committee(s) (Approval for submission to Member States for comments)	Q2 2029
STEP 8: Soliciting comments by Member States	Q3 2029
STEP 9: Addressing comments by Member States	Q1 2030
STEP 10: Second internal review of the draft publication (Approval by the Coordination Committee)	Q1 2030
STEP 11: Second review of the draft publication by the review Committee(s) (Approval of the draft)	Q2 2030
STEP 12: (For Safety Standards) Editing of the draft publication in MTCD and endorsement of the draft publication by the CSS (For nuclear security guidance) DDG's decision on whether additional consultation is needed, establishment by the Publications Committee and editing	Q4 2030
STEP 13: Approval by the Board of Governors (for SF and SR only)	N/A
STEP 14: Target publication date	Q1 2031

9. RESOURCES

It is estimated that the revision of the Safety Guide would involve approximately 340 weeks of effort by experts. This is based upon assuming 10 one-week consultancy meetings, involving no more than 15 experts and an average of one week of work per expert between meetings, plus assuming 40 one-week home-based assignments. One Technical Meeting (one week) is also scheduled in October 2026 (EVT2503544).

Agency resources involved are estimated at 50 weeks of effort by the Technical Officer and 30 additional weeks of other IAEA staff.

ANNEX – Feedback Analysis Report

The revision of SSG-30 will consider inputs from multiple sources, including:

1. Insights from technical safety review (TSR) services conducted for nuclear power reactor designs, including both water-cooled and NWCR technologies, and SMRs;
2. Discussions from Consultancy Meetings held in December 2025 (EVT2400650) and in March 2026 (EVT2503029);
3. Preliminary gap analysis.

1. Feedback from IAEA review missions on design safety and safety assessment

Since 2016, the Safety Assessment Section conducted 19 technical safety review (TSR) missions focused on the design safety and safety assessment, including those for evolutionary, innovative reactors and SMRs (including AHPR1000, Rolls Royce SMR, NuScale SMR and SALUS-100 SFR). The main feedback from those TSRs is that the IAEA guidance on approach for safety classification is generally applicable to all reactor technologies and SMR designs. However, additional clarification is needed regarding the rules to be applied once the SSCs are classified.

2. Discussions from Consultancy Meetings (EVT2400650 and EVT2503029)

Consultancy Meetings were held in December 2025 and in March 2026 to discuss the development of the draft DPP for the revision of SSG-30.

Participants shared an overview of their experience in safety classification of SSCs, covering past and ongoing projects, whether based on proven or innovative technologies, including:

1. The classification processes applied in their respective countries.
2. Lessons learned from implementing the recommendations of SSG-30.
3. Perspectives, expectations, and suggestions for the upcoming revision.

The following items summarize key observations made by the participating experts:

a. Significance of updating SSG-30 to ensure sustainability of nuclear power plant as an option to support increasing demands in energy: There appears to be consensus among the participating experts, which consisted of representatives from the regulators as well as the regulated community who have used SSG-30 that outcomes of the safety classification process (e.g. subset of SSCs that are classified as Safety Class 1), that SSG-30 is highly consequential to the safe operation and sustainability of nuclear power as an option to provide increasing needs for electrical power needs. The experts identified an opportunity to improve the clarity of SSG-30, to alleviate inefficiencies during design iteration and reduce the likelihood of significant challenges arising during regulatory review, which have occurred from its application in some instances.

b. Opportunity to enhance the clarity of guidance in SSG-30 using contents of TECDOC-1787: There appears to be consensus among participating experts who have used SSG-30 that TECDOC-1787, which was published in 2016 (two years after the publication of SSG-30), contains extremely valuable information that facilitates the use of SSG-30. Therefore, the experts suggested that the revised version should attempt to capture useful practices and insights documented in TECDOC-1787 into the future revision of SSG-30 at an appropriate level of details. For example, TECDOC-

1787 discusses explicitly linking the safety categories of functions with the safety classes of SSCs. This information is essential for the appropriate use of SSG-30; therefore, this should be incorporated into the revision of SSG-30. Beyond expanding Section 4 (see below), the use of an Annex, or an Appendix that captures important insights that can be gleaned from TECDOC-1787 was suggested.

c. Expanding guidance pertaining to design rules: There appears to be consensus among participating experts that Section 4 of SSG-30 entitled "Selection of Applicable Engineering and Design Rules for SSCs" should be expanded to include additional guidance to enable designers and regulators to align on engineering standards appropriate for various safety classes.

   The experts discussed the potential value of providing guidance on constraints under which commercial grade SSCs may be used to support safety-classified SSCs, including testing, inspection, maintenance and quality assurance. The possibility of including a footnote reference to TECDOC-2034 was also considered.

   The experts also discussed the need to provide additional details on design rules for environmental qualification, supports to components (mechanical, electrical…), electrical equipment, I&C equipment, fire, structures, and pressure retaining equipment in this section.

d. Challenges associated with classifying SSCs using "Design Provisions" and "Safety Functions" as independent entities: A number of experts emphasized that the term "Design Provisions" and the associated SSG-30 text appears to be misunderstood. Some experts consider that a safety function can be defined to represent the purpose required in the interest of safety, to be performed by the design provision. However, other experts recall that introduction of the concept of design provisions was needed to ensure a consensus on current version. It was also noted that the term design provision is not included in the IAEA glossary (other than reference in Anticipated Operational Occurrences).

e. Risk-Informed approaches in the classification process: Some experts acknowledged that the current version of SSG-30 is "risk-informed" to some extent. However, they also noted that when revising the guidance, efforts must be explored to ensure that SSG-30 can better accommodate the use of risk-informed approaches, especially regarding innovative technology designs.

f. Potential conservative classification due to challenges associated with consequence assessment: One expert noted that consequences of failures can be difficult to demonstrate, as assessing radiological impacts for SSC classification often requires lengthy and complex studies. As a result, a practical approach may be to consider all potential consequences as high, which results, at least initially, in overly conservative classification which must be resolved at later stages of the classification process (using additional guidance in TECDOC-1787).

g. Classifying doses affecting plant workers: Some experts noted that SSG-30 (para. 3.11) suggests that faults resulting only in worker consequences are always considered "low" severity (what if such a consequence constitutes injury or fatality to a worker?).

h. Classification of backup systems vs. Categorization of backup functions: Some experts noted the need to revisit the guidance related to "Classification" of backup systems vs. "Categorization" of backup functions.

i. Classifying significant systems supporting normal operation: Some experts noted that the guidance is insufficient to determine to what extent systems such as main control systems that support normal operation of the plant should be classified.

j. Classifying portable equipment: Some experts noted that the use of non-permanent equipment (e.g. additional equipment that may be located offsite to address extended loss of all AC power or Ultimate Heat Sink) should be considered in the discussions for the revision of SSG-30.

From these discussions, the following developments were proposed for the SSG-30 revision:

- Sections 1 (Introduction) and 2 (General Approach, as a foundational safety approach for the safety classification of SSCs) might be preserved, as in the current version.
- Section 3 (Safety Classification Process) provides detailed guidance on identifying the functions to be categorized, the identification of design provisions and the SSCs to be classified. In addition to addressing interfaces with different deployment options (such as transportable or propulsion-based systems) this section will be further strengthened by considering the application of this approach to innovative designs.
- Section 4 (Selection of Applicable Engineering Design Rules for SSCs) outlines the engineering design rules derived from relevant national or international codes, standards, and established practices that should be applied once the safety classes of SSCs have been determined. However, feedback from Member States on the use of this guidance for applicable rules is expected to be included in this section (see Annex). Strengthening this section should include ensuring alignment and consistency with other classification schemes, such as those related to fire protection or seismic. Additionally, consideration should be given to the growing use of commercial-grade components in the nuclear industry.

5. Preliminary Gap Analysis

A paragraph-by-paragraph gap analysis has been conducted for SSG-30 to assess its applicability to reactor designs other than WCRs. The review follows the methodology defined and applied in TECDOC-2010 and TECDOC-1936 and takes into account the relevant findings reported in SRS-123. The outcomes of this analysis are intended to inform and guide potential modifications to SSG-30, based on the following rationale:

C1: The recommendation is fully applicable to all NPPs (including for all reactor technologies, land-based and transportable, i.e. technology neutral / inclusive). No changes are necessary.

C2: The recommendation is fully applicable to all NPPs, but only minor wording adjustments are needed to ensure broad applicability.

C3: The recommendation is specific to a type of NPP (e.g. WCRs). It will be retained as it is or improved as needed, based on the experience feedback from the use of the current IAEA Safety Standard. Equivalent or additional recommendations should be developed for other NPPs (e.g. transportable reactors, other nuclear installations or radiation sources). Finally, C3 will also allow the introduction of new recommendations, as needed.

The initial gap analysis indicates that all 63 paragraphs of SSG-30 are technology-neutral (100% C1), consistent with the statement in paragraph 1.9. This finding is also aligned with the conclusions of SRS-123, which identified no gaps in the applicability of SSG-30 to NWCRs and SMRs. However, feedback received from the two above-mentioned consultancy meetings suggests that additional guidance is needed to support the application of the recommendations in Sections 3 and 4 across the full range of reactor technologies. Such considerations may be particularly challenging for innovative reactor concepts. Consequently, the revision is likely to introduce additional guidance, where

appropriate. These should be carefully formulated to ensure their applicability to a broad spectrum of reactor technologies while maintaining a consistently high level of safety for all NPPs.

Moreover, throughout the revision process (and in alignment with DS562), interfaces with classification guidance for specific SSCs will be systematically maintained. This will include close coordination with recommendations provided in other safety guides that are not yet technology-neutral, such as SSG-53 and SSG-56.