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Commission on Safety Standards
Report of the Fifth Term
2012-2015

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A. INTRODUCTION

In August 1995, the Agency introduced a new approach for the preparation and review of its Safety Standards. The new approach created a Commission on Safety Standards (CSS) and the four specialist Committees (for nuclear safety, radiation safety, transport safety and radioactive waste safety). The CSS has a special overview role with regard to the Agency's safety standards and provides advice to the Director General on the overall programme on regulatory aspects of safety. The terms of reference are provided in Appendix 1.

The Director General appoints the Commission's members, and the members of the Committees are appointed by the Deputy Director General, Head of the Nuclear Safety and Security Department. The Commission members are appointed for a four-year term. The members of the Commission are given in Appendix 2.

According to the document on Strategies and Process for the Establishment of IAEA Safety Standards (SPESS A), the Chairperson, in consultation with the Scientific Secretary, will submit (1) a report of each CSS meeting, (2) a mid-term report of the progress of the CSS on its programme of work and (3) an end of term report on its achievements over its four year term and its recommendations for the future.

This report constitutes the end of term report for the fifth CSS term and provides a review of the work of the Commission on Safety Standards during the fourth four-year term covering the period **January 2012 to December 2015**. In the fifth term the Commission held eight meetings. The purpose of this report is to:

- record the work of the Commission, particularly on strategy and policy issues;
- report on progress on the review of the Standards under development and identify areas for particular attention; and
- record the Commission's recommendations to the Director General and Committees for the future direction of the work on Safety Standards.

At the end of the previous term of the Commission on Safety Standards (CSS), in December 2011, the Chairman of the Commission, Mr André-Claude Lacoste, provided a similar report to the Director General indicating the progress achieved in the four years from 2008 to 2011. His report highlighted major achievements during the fourth term, including the approval in May 2008 of the Roadmap for the long term structure of IAEA safety standards; the issue of the document on Strategies and Processes for the Establishment of IAEA Safety Standards (SPESS); the progress toward addressing synergies and interface between the Safety Standards Series and the Nuclear Security Series as elaborated by the Joint Task Force of the Advisory Group on Nuclear Security (AdSec) and the CSS; and the initiation of the review of standards following the Fukushima Daiichi accident.

At the beginning of the fifth term, therefore, two significant new aspects of the work of the CSS had been established: a new committee structure for the review and approval of publications in the Safety Standards Series and the Nuclear Security Series; and the process relating to the analysis of feedback from the Fukushima Daiichi accident in the light of its potential implications for the safety standards.

At the end of this fifth term a new Committee was established, the Emergency Preparedness and Response Standards Committee (EPReSC) and the last two meetings of the fifth term of the CSS were

opportunities to be informed of the DDG's intent and to exchange views on the first steps of its establishment.

B. MAIN ACHIEVEMENTS DURING THE FIFTH TERM

The CSS is proud to report on its achievements during this term.

B.1. Long term structure of the IAEA Safety Standards

During its previous term, the Commission approved a Roadmap for the long term structure of IAEA Safety Standards with a set of General Safety Requirements applicable to all facilities and activities, complemented by a series of facility and activity specific Safety Requirements. For General Safety Requirements and Specific Safety Requirements, a new format was also adopted with a discrete set of overarching requirements followed by requirements of associated conditions to be met, both expressed as "shall" statements. The Commission also approved during its previous term criteria for the optimization of the Safety Guides structure (inserted in Annex IV of SPESS A), which resulted in a reference list of Safety Guides for the long term structure approved in 2009.

During the present term, the Commission made good progress toward the achievement of the long term structure of the Safety Requirements, with the following situation for the General Safety Requirements and the Specific Safety Requirements:

- GSR Part 1 (Rev. 1), Governmental, Legal and Regulatory Framework for Safety: published in 2015
- GSR Part 2, Leadership and Management for Safety: draft to be submitted to the CSS for endorsement
- GSR Part 3, Radiation Protection and Safety of Radiation Sources: published in 2014
- GSR Part 4 (Rev. 1), Safety Assessment for Facilities and Activities: published in 2015
- GSR Part 5, Predisposal Management of Radioactive Waste: published in 2009
- GSR Part 6, Decommissioning of Facilities: published in 2014
- GSR Part 7, Preparedness and Response for a Nuclear or Radiological Emergency: published in 2015

- SSR1, Site Evaluation for Nuclear Installations: draft being prepared to be submitted to the Committees for review before Member States consultation
- SSR-2/1 (Rev. 1), Safety of Nuclear Power Plants: Design: published in 2015
- SSR-2/2 (Rev. 1), Safety of Nuclear Power Plants: Commissioning and Operation: published in 2015
- SSR-3, Safety of Research Reactors: draft to be submitted to the CSS for final endorsement
- SSR-4, Safety of Nuclear Fuel Cycle Facilities: draft submitted to Member States for comments
- SSR-5, Disposal of Radioactive Waste: published in 2011

- SSR-6, 2012 Edition, Regulations for the Safe Transport of Radioactive Material: published in 2012

Some of the above Safety Requirements were further revised by amendments as part of the review in light of the Fukushima Daiichi accident (see part c here below)

The Commission also noted the establishment of the long term structure of the Safety Guides that implements the criteria approved in 2009, with the total number of safety standards now stabilized at around 130.

B.2. Endorsement of standards and approval of DPPs

The CSS endorsed 31 new safety standards (8 Safety Requirements, including 5 revised by amendment, and 23 Safety Guides) for publication. This included NS-R-5 (Rev. 1) with an addendum of two new appendices, establishing specific safety requirements for reprocessing facilities and for fuel cycle research and development facilities. The second Safety Requirements publication endorsed by the CSS was GSR Part 6 on Decommissioning of Facilities, a revision of the previous edition, WS-R-5. The CSS also endorsed the revision by amendment of five Safety Requirements in light of the Fukushima Daiichi accident, namely GSR Part 1 (Rev. 1), NS-R-3 (Rev. 1), SSR-2/1 (Rev. 1), SSR-2/2 (Rev. 1) and GSR Part 4 (Rev. 1) (see part c here below) and the Safety Requirements GSR Part 7 on Preparedness and Response for a Nuclear or Radiological Emergency, a revision of the previous publication GS-R-2. A detailed list of endorsed safety standards is available in Appendix 3.

The CSS approved 31 new DPPs (document preparation profiles) and 2 revised DPPs. Eight of these DPPs were for revised Safety Requirements (including 5 Safety Requirements revised by amendment). Nine of the DPPs were for new Safety Guides, while 20 were for revisions and sometime combinations of 25 existing Safety Guides. The CSS noted the increase in DPPs for revisions of existing standards, and recognized that this is a clear reflection of a process of stabilization of the overall collection of safety standards, as set out in the Road Map for the long-term structure for the standards established in the CSS's fourth term in 2008. Among these DPPs, the DPP DS462, discussed hereafter in this report, relates to the revision of five Safety Requirements in the light of the Fukushima Daiichi accident. A detailed list of approved DPPs is available in Appendix 4.

B.3. The review of standards in the light of lessons from the Fukushima Daiichi accident

Review/revision of the IAEA Safety Requirements

The accident at the Fukushima Daiichi nuclear power plant in Japan happened in the year preceding the beginning of the fifth term of the CSS. The Director General issued a comprehensive report on the accident in August 2015 toward the end of the fifth term. The IAEA Action Plan on Nuclear Safety was developed in response to the Fukushima Daiichi accident and was approved by the IAEA Board of Governors and endorsed by the IAEA General Conference in September 2011 (GOV/2011/59-GC(55)/14). This Action Plan includes an action headed: 'Review and strengthen IAEA Safety Standards and improve their implementation'.

This action called upon the Commission on Safety Standards and the IAEA Secretariat "to review, and revise as necessary using the existing process in a more efficient manner, the relevant IAEA safety standards in a prioritized sequence", and called on Member States "to utilize as broadly and effectively as possible the IAEA safety standards in an open, timely and transparent manner".

This review included, among other things, the regulatory structure, emergency preparedness and response, and nuclear safety and engineering aspects (site selection and evaluation, assessment of extreme natural hazards, including their combined effects, management of severe accidents, station

blackout, loss of heat sink, accumulation of explosive gases, the behaviour of nuclear fuel and the safety of spent fuel storage).

In 2011 the Secretariat commenced such a review of Safety Requirements publications in the IAEA Safety Standards Series on the basis of information that was available on the Fukushima Daiichi accident, including two reports from the Government of Japan, issued in June 2011 and September 2011, the report of the IAEA International Fact Finding Expert Mission conducted in Japan from 24 May to 2 June 2011, and a letter from the Chairman of the International Nuclear Safety Group (INSAG) to the Director General dated 26 July 2011. As a priority, the Secretariat reviewed the Safety Requirements publications applicable to nuclear power plants and to the storage of spent fuel.

The review consisted first of a comprehensive analysis of the findings of these reports. In the light of the results of this analysis, the Safety Requirements publications were then examined in a systematic manner in order to decide whether amendments were desirable to reflect any of these findings.

On that basis, the CSS approved, at its meeting in October 2012, a proposal for a revision process by amendment for the following five Safety Requirements publications: Governmental, Legal and Regulatory Framework for Safety (GSR Part 1, 2010), Site Evaluation for Nuclear Installations (NS-R-3, 2003), Safety of Nuclear Power Plants: Design (SSR-2/1, 2012), Safety of Nuclear Power Plants: Commissioning and Operation (SSR-2/2, 2011), and Safety Assessment for Facilities and Activities (GSR Part 4, 2009).

Additional inputs were considered in preparing the draft text of the proposed amendments to these five safety standards in 2012 and 2013, including the findings of the IAEA International Experts' Meetings and presentations made at the Second Extraordinary Meeting of the Contracting Parties to the Convention on Nuclear Safety in August 2012. Several national and regional reports were also considered.

On the review of the Safety Requirements, the Commission concludes, as reflected in a letter from the CSS Chair to the Director General dated 6 January 2014, that "the review has confirmed so far the adequacy of the current Safety Requirements. The review revealed no significant areas of weakness, and just a small set of amendments were proposed to strengthen the requirements and facilitate their implementation. The CSS believes that the IAEA safety standards should be enhanced mainly through the well-established review and revision process that has been in use for some years. At the same time, CSS members highlighted that the basis for the review and revision of the IAEA safety standards should not be limited to the lessons of the Fukushima Daiichi accident. This basis should also include other operating experience from elsewhere as well as information gained from advances in research and development. The CSS also stressed that greater attention needs to be paid to the implementation of IAEA safety standards by and in Member States."

The draft amendments were reviewed by the Secretariat in consultants' meetings, as well as by the Nuclear Safety Standards Committee, the Radiation Safety Standards Committee, the Transport Safety Standards Committee and the Waste Safety Standards Committee, in the first half of 2013. They were also presented for information to the Nuclear Security Guidance Committee in 2013. The draft amendments were then submitted to IAEA Member States for comment and revised in consultants' meetings in the light of comments received. The proposed amendments were then approved by all four Safety Standards Committees at their meetings in June and July 2014, and were endorsed by the CSS at its meeting in November 2014.

The Board, at its meeting starting on 2 March 2015, established as Agency safety standards — in accordance with Article III.A.6 of the Statute — the draft revised Safety Requirements publications, and authorized the Director General to promulgate these revised Safety Requirements and to issue them as Safety Requirements publications in the IAEA Safety Standards Series.

For GSR Part 1, the revisions relate to the following main areas:

☐ Independence of the regulatory body

☐ Prime responsibility for safety

☐ Emergency preparedness and response

☐ International obligations and arrangements for international cooperation

☐ Liaison between the regulatory body and authorized parties

☐ Review and assessment of information relevant to safety

☐ Communication and consultation with interested parties

For NS-R-3, the revisions relate to the following main areas:

☐ The potential occurrence of events in combination;

☐ Establishing levels of hazard for the design basis for the installation and their associated uncertainties;

☐ Multiple facilities at a single site;

☐ Monitoring of hazards and periodic review of site specific hazards.

For SSR-2/1, the revisions relate to the following main areas:

☐ Prevention of severe accidents by strengthening the design basis for the plant

☐ Prevention of unacceptable radiological consequences of a severe accident for the public and the environment

☐ Mitigation of the consequences of a severe accident to avoid or to minimize radioactive contamination off the site

For SSR-2/2, the proposed revisions relate to the following main areas:

☐ Periodic safety review and feedback from operating experience

☐ Emergency preparedness

☐ Accident management

☐ Fire safety

For GSR Part 4, the revisions relate to the following main areas:

☐ Margins for withstanding external events;

☐ Margins for avoiding cliff edge effects;

☐ Safety assessment for multiple facilities or activities at a single site;

☐ Safety assessment in cases where resources at a facility are shared;

☐ Human factors in accident conditions.

This revision process has been carried out in conjunction with the revision of Preparedness and Response for a Nuclear or Radiological Emergency (IAEA Safety Standards Series No. GS-R-2, 2002)

(DS457) and of The Management System for Facilities and Activities (IAEA Safety Standards Series No. GS-R-3, 2006) (DS456).

With a view to also taking into account findings from the Fukushima Daiichi accident for other facilities, and particularly for research reactors and nuclear fuel cycle facilities, two DPPs were initiated in 2012 for the revision of the Safety Requirements NS-R-4 and NS-R-5. The DPPs were approved by the CSS in April 2014. A DPP for the revision of NS-R-3 on Site Evaluation for Nuclear Installations was also initiated and approved by the Commission in November 2014.

The review by the Safety Standards Committees of other Safety Requirements led to the conclusion that, at this stage, there is no need to revise the requirements on the Predisposal Management of Radioactive Waste (GSR Part 5) and on the Disposal of Radioactive Waste (SSR-5). The revision of the Safety Requirements on Preparedness and Response for a Nuclear or Radiological Emergency (DS457) and actual experience from the remediation activities after the Fukushima Daiichi accident may result in a future proposal to revise, only through specific amendments, the Safety Requirements GSR Part 3 on Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards. Finally, certain specific aspects related to transport safety are also considered for the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, SSR-6.

Review/revision of the IAEA Safety Guides

With regard to the review/revision of the Safety Guides, a first step was to analyse whether the methodology adopted for the Safety Requirements would also be appropriate for the Safety Guides and to prioritize the review of the Safety Guides, i.e. a prioritization of the review of the Safety Guides based on same the list of findings as identified for the above mentioned review of the Safety Requirements.

A pilot study was conducted in 2012 for the review of three Safety Guides applicable to nuclear power plants, namely NS-G-1.9 on Design of the Reactor Coolant System and Associated Systems in Nuclear Power Plants (2004), NS-G-1.10 on Design of Reactor Containment Systems for Nuclear Power Plants (2004) and NS-G-2.15 on Severe Accident Management Programmes for Nuclear Power Plants (2009).

It was concluded that the methodology was appropriate but that any revision would not be restricted to only the findings from the Fukushima Daiichi accident, as other aspects, and particularly guidance on meeting the new Safety Requirements SSR-2/1 and SSR-2/2 issued respectively in 2012 and 2011 also needed to be addressed, together with guidance on meeting the amendments proposed to SSR-2/1 and SSR-2/2 as part of the draft DS462 mentioned above. Three DPPs were then prepared for the revision of these three Safety Guides and submitted to the Review Committees before their submission early in 2014 to the Commission.

For NS-G-1.9 on Design of the Reactor Coolant System and Associated Systems in Nuclear Power Plants, the revision will ensure consistency with SSR 2/1 and the style of the Safety Standards Series. It will also reflect current terminology and requirements on plant conditions, e.g. design extension conditions, defence in depth and the design basis. The appendix and the annexes will also be updated (new plant design aspects, removal of safety classification in the main text and an annex).

For NS-G-1.10 on Design of Reactor Containment Systems for Nuclear Power Plants, the revision aims at providing recommendations and guidance on how to comply with the requirements established SSR-2/1 amended by the addendum DS462. Particular attention will be paid to the role of the containment systems in the prevention of severe accidents and mitigation of the consequences of a core melt accident taking into account that the objectives in terms of protection of the public and the environment have been enhanced.

For NS-G-2.15 on Severe Accident Management Programmes for Nuclear Power Plants, it was found that there are opportunities to further strengthen the Safety Guide. NS-G-2.15 needs to extend its guidance to core/debris cooling, removal of decay heat and long-term cooling, and maintaining

containment integrity. Additional guidance is provided for cooling with sources that have not been qualified, run-off of contaminated water, threats from the cooling of spent fuel, and large-scale natural events at multi-unit sites. Shutdown conditions are also considered. It includes conditions where command and control for the event have been lost, where there is large-scale damage on the site, where major safety functions such as control of reactivity, removal of heat from the core and from spent fuel, confinement of radioactive material and limitation of radioactive releases have been lost, and either must be repaired under difficult circumstances or must be replaced by portable equipment, which is either stored in on-site storage or brought in by road or by air transport from an off-site storage location.

A complementary pilot study was also performed in 2013 with the review of three additional Safety Guides - NS-G-1.5 on External Events Excluding Earthquakes in the Design of Nuclear Power Plants (2003), NS-G-1.6 on Seismic Design and Qualification for Nuclear Power Plants (2003), and SSG-2 on Deterministic Safety Analysis for Nuclear Power Plants (2009) - for which it was also concluded that a revision was needed. Two additional Safety Guides, SSG-15 on Storage of Spent Nuclear Fuel and NS-G-1.4 on Design of Fuel Handling and Storage Systems for Nuclear Power Plants are being reviewed.

Other Safety Guides were proposed for revision as a result of the findings from the Fukushima Daiichi accident, for example WS-G-3.1 on Remediation Process for Areas Affected by Past Activities and Accidents (2007), and the DPP for this revision was approved at the CSS meeting in October 2012.

New Safety Guides were also proposed in this context such as DS474 on Arrangements for the Termination of a Nuclear or Radiological Emergency and DS475 on Arrangements for Public Communications in Preparedness and Response for a Nuclear or Radiological Emergency, for which DPPs were approved at the CSS meeting in November 2013.

Implications of the Vienna Declaration on Nuclear Safety

At the Diplomatic Conference held on 9 February 2015 to consider a proposal to amend the Convention on Nuclear Safety, the Contracting Parties to the CNS adopted by consensus the “Vienna Declaration on Nuclear Safety” including principles for the implementation of the Convention to prevent accidents and mitigate radiological consequences:

1- New nuclear power plants are to be designed, sited, and constructed, consistent with the objective of preventing accidents in the commissioning and operation and, should an accident occur, mitigating possible releases of radionuclides causing long-term off site contamination and avoiding early radioactive releases or radioactive releases large enough to require long-term protective measures and actions.

2- Comprehensive and systematic safety assessments are to be carried out periodically and regularly for existing installations throughout their lifetime in order to identify safety improvements that are oriented to meet the above objective. Reasonably practicable or achievable safety improvements are to be implemented in a timely manner.

The Contracting Parties also requested its transmission to the CSS “for its consideration with the four safety standards committees under its aegis, of the technical elements contained therein with a view to incorporating them as appropriate into the relevant Safety Standards”.

In a letter dated 18 February 2015, the Director General therefore requested this consideration to be included as an agenda item for the April 2015 CSS meeting, after exchange with the Chairs of the Committees and to receive a report on what actions the Commissions recommends so as to ensure that the technical elements contained in the Vienna Declaration are incorporated and further developed in a timely manner in the relevant Safety Guides.

After consideration of the Secretariat’s proposal by the CSS, the Chairs of the Committees and the Nuclear Safety Standards Committee, the CSS Chair provided in a letter dated 20 August 2015 the

CSS's conclusions related to the consideration, in the set of safety standards, of the technical elements contained in the Vienna Declaration.

The letter considered, as noted in the Director General's letter, that good progress had been achieved in the revision of the Safety Requirements, and confirmed that the technical elements of the Vienna Declaration were already well reflected in the relevant Safety Requirements: GSR Part 1 (Rev. 1) on Governmental, Legal and Regulatory Framework for Safety, SSR-2/1 (Rev. 1) on Safety of Nuclear Power Plants: Design, and SSR-2/2 (Rev. 1) on Safety of Nuclear Power Plants: Commissioning and Operation.

The CSS therefore focused its efforts, as recommended in the Director General's letter, on the consideration of the relevant Safety Guides. In doing so, the CSS also consulted the Nuclear Safety Standards Committee (NUSSC). A number of Safety Guides were already under revision at the time of the CSS meeting in April 2015 as part of the Nuclear Safety Action Plan to strengthen the safety standards in light of the Fukushima Daiichi accident. In response to the Director General's request, the CSS accepted the proposal from the Secretariat to consider six further Safety Guides in the list of priorities for review and possible revision which also directly or indirectly relate to the technical elements cited in the Vienna Declaration:

- SSG-25: Periodic Safety Review for Nuclear Power Plants
- NS-G-1.5: External Events Excluding Earthquakes in the Design of Nuclear Power Plants (already identified by NUSSC in June 2013)
- NS-G-1.7: Protection against Internal Fires and Explosions in the Design of Nuclear Power Plants
- NS-G-1.11: Protection against Internal Hazards other than Fires and Explosions in the Design of Nuclear Power Plants
- NS-G-2.3: Modifications to Nuclear Power Plants
- NS-G-2.6: Maintenance, Surveillance and In-Service Inspection in Nuclear Power Plants

At its meeting in June 2015, NUSSC recommended that the first four Safety Guides on this list be considered priorities.

B.4. The integration of safety and security

At the end of its fourth term, the Commission reported on the progress and recommendations of the Joint AdSec CSS Task force on the establishment of an intermediate structure with the new Nuclear Security Guidance Committee (NSGC) and the Interface Group.

The NSGC was established in March 2012 as a standing body of senior representatives in the area of nuclear security, open to all Member States, to make recommendations to the Deputy Director General, Head of the Department of Nuclear Safety and Security on the development and review of the Nuclear Security Series publications. The NSGC Terms of Reference indicates that the objective is to significantly contribute to greater transparency, consensus, quality, coherence and consistency by engaging more Member States in the development of international publications for nuclear security. The NSGC held its first meeting in June 2012.

The Interface Group was also established, immediately following the first meeting of the NSGC. It is composed of eight members with a balanced representation of the Safety Standards Committees and the NSGC. The initial composition consists of the Chairs of the Safety Standards Committees (NUSSC, RASSC, TRANSSC, WASSC) and four representatives of the NSGC. Its function is to review all DPPs for Safety Standards and Nuclear Security Series publications - excluding those for Technical Guidance - and, after considering the recommendations of the Coordination Committee, to identify whether there is a safety/security interface, to document the nature of the interface and to refer the DPP to the appropriate Committee(s) for review and approval.

With a view to initiating the cross-consultation process and deciding on how to address the drafts already being developed, the Interface Group met in September 2012 and reviewed all DPPs for draft

Safety Standards and draft Nuclear Security Series publications under development. 60 DPPs were examined, of which 33 of the 44 draft Safety Standards and 13 of 16 draft Nuclear Security Series publications were identified as being 'interface documents'. As an exception during the initial phase and for the drafts close to final approval, the Interface Group recommended transitional measures with a view to avoiding undue delays.

The Interface Group was then consulted essentially through electronic consultation (a dedicated web page was established and a consultation process by email put in place). 35 new or revised DPPs (for 22 safety standards and 12 nuclear security guidance, including one for which a second consultation was organized after revision of the DPP) were submitted to the Interface Group with a recommendation from the Coordination Committee. Generally, the proposals from the Coordination Committee were accepted. With these consultations, it appears that almost 80% of the Safety Standards under development have some sort of interface with nuclear security that need to be reviewed by NSGC and more than 80% of the Nuclear Security Guidance under development have an interface with safety that needs to be reviewed by at least one Safety Standards Committee.

With regard to the review and approval process, a procedure, very similar to the one in place since 1996 for the IAEA Safety Standards, was also adopted for the Nuclear Security Guidance. The main difference is that the Commission is not involved (unless for information on a case by case basis) in the final approval of the draft before their submission for publication. The meetings of the Committees are also synchronized with a view to avoiding undue delays in the process. The general working methods, in term of deadline for submission of drafts and resolution of comments, were also harmonized between the five Review Committees. The detailed process is now reflected in a revision issued in March 2013 of the SPESS B document on the "Step by Step Preparation and Review Process" that is now applicable for both the Safety Standards and the Nuclear Security Series. The SPESS A document on "Strategies and Processes for the Establishment of IAEA Safety Standards" was also updated in March 2013 to reflect the establishment of the NSGC and the Interface Group.

All drafts and DPPs for safety standards identified as interface documents were submitted for review to the NSGC. Similarly, draft Nuclear Security Series publications and DPPs for Nuclear Security Series publications were submitted to one or more of the Safety Standards Committees, and sometime to all of them, in order to review the interface aspects and verify the appropriate cross-references to Safety Standards. This first experience was beneficial in terms of better identifying how to address the interface with security in safety standards and detailed guidelines for the Technical Officers on how to address the interfaces between safety and security when preparing the drafts safety standards and nuclear security guidance were prepared, agreed by the Committees and the CSS and incorporated in the SPESS C document in July 2014.

In this regard, the Commission wishes to draw the attention to the fact that the scope of the review by the Committees should not be restricted to a review of what is considered and already identified as an interface aspect, but also to ensure that the text on safety recommendations in the draft safety standards does not compromise security and that the text on security recommendations in the draft nuclear security guidance does not compromise safety, thus allowing a systematic analysis of all interface and potential interface aspects.

The coordination that has occurred so far between the Safety Standards Committees and the Nuclear Security Guidance Committee provides an early indication of the feasibility of harmonizing safety and security. To date, no barriers have been identified that would preclude this harmonization. Indeed, the coordinated reviews have confirmed the importance of close integration on several important aspects, including digital instrumentation and control, the management system, emergency preparedness and response and the control of radiation sources.

Finally, at the occasion of the renewal of the terms of the Safety Standards Committees for 2014-2016, the Terms of Reference of the Safety Standards Committees and of the Nuclear Security Guidance Committee were harmonized.

The Commission therefore notes the progress achieved so far and wishes to encourage further work toward harmonization of safety and security.

B.5. Future review, revision and publication process

After more than 50 years of history of the IAEA Safety Standards and after having a nearly complete set of standards covering all main safety areas, the Commission also discussed the proposal from the Secretariat that a more efficient approach be adopted for the future review, revision and publication of the safety standards, with the following key objectives:

- To ensure that the review and revision of published standards is based on a systematic feedback collection and analysis process
- To ensure that any revision of the safety standards or part of the safety standards is justified by the above mentioned feedback process, therefore also ensuring stability of the parts of the standards that remain valid
- To maintain the technical consistency among the standards through a management of the standards as a complete collection rather than by individual management of individual standards
- To enhance semantic consistency through systematic use of harmonized terminology
- To ensure the completeness of the collection through a systematic top-down development approach complemented by topical gap analyses
- To support harmonized use and application of the safety standards by enhancing their user-friendliness and by providing tools for user to easily navigate within the whole collection.

During its fourth term, in 2010, the Commission already started discussions of the first objective in order to further improve the existing mechanisms to collect, analyse and use the feedback from the use of the IAEA Safety Standards for their future revision. A modular approach was presented whereby the set of overarching requirements could be used to categorize the information, store it and retrieve it for analysis on a topical basis. In 2011, a pilot study was presented showing the feasibility of that approach at the occasion of the revision of the Safety Requirements WS-R-5 (DS450) on Decommissioning of Facilities Using Radioactive Material and the associated Safety Guides.

Moreover, based on that experience, the approach of topical oriented review/revision of the IAEA Safety Standards was selected by the Committees and the CSS for the review and revision of the IAEA Safety Requirements in light of the Fukushima Daiichi accident (DS462), as mentioned above in this report.

One particular advantage of this approach is that it addresses the second and third above mentioned objectives. The topical oriented review/revision process allows for focusing, during a revision, on those aspects for which there is a strong justification for amending the standards, thus ensuring at the same time both a rigorous justification process for their revision and the stability of those parts that remain valid. A second, also important advantage is to permit the synchronous and coherent revision of several standards for the parts that relate to the selected topics, thus ensuring the maintenance of the consistency between the standards, which is impossible with a document by document and sequential revision process.

This CSS discussion continued during its fifth term and expanded on the need for electronic publications of the IAEA Safety Standards. In particular, at the 32nd meeting held in October 2012, the Commission requested the Secretariat “to investigate issues relating to issuing safety standards essentially as electronic versions and the Safety Standards Committees to be consulted on future challenges on the publication process and use of electronic versions of safety standards, noting the support for the CSS on moving from a document by document revision process to a feedback based, topical oriented revision and addendum process.” It was noted in particular in this context that the

easiest mechanism for the users to identify which are the valid safety standards was to refer to the electronic publications made available and to other tools such as web pages that include an overall status of the IAEA Safety Standards and the whole collection of established and valid safety standards.

Further significant developments were achieved during the years 2013 to 2015 and were regularly presented at each CSS meeting. The framework received full support from the CSS and went into initial operation in 2015. It is composed of the following key components:

- A content management system to manage the whole collection, the feedback mechanism, the content of the safety standards and the relationships between the standards
- A electronically supported review, revision and approval process management system
- An On-line User Interface (NSS-OUI) that facilitates access to the content of the Safety Standards and greatly enables in depth navigation through the collection

The content management system is based on a central storage principle and by operating an IT system that is primarily content oriented instead of format oriented. For the content management system a set of topical areas were determined (essentially using the overarching requirements as a tool to identify the main topical areas covered by the safety standards) to categorize any feedback and any topical relationship. A refined taxonomy/ontology was finalized in 2015 and is now used to tag each document as a whole and also each part of their detailed content. Relationships between the safety standards are also managed in this approach, in particular:

a. Topical relationships, i.e. relationships between Safety Requirements addressing a similar topic

b. Hierarchical relationships, i.e. relationships between the Safety Requirements and the Safety Guides, which also includes topical relationships, indicating which Safety Guides or part of Safety Guides cover a specific topical area addressed in a Safety Requirements publication

c. Semantic relationships, i.e. relation with the IAEA Safety Glossary for harmonized use of the definitions and concepts

On the electronically supported review, revision and approval process management system, the concept is to support the feedback collection and allocation to topical areas, then to analyse the information accumulated for each topical areas so as to implement a decision making process on the justifications for the revision. This first part is now in operation. The concept is expected to be expanded to support the revision process by managing electronically the versions of the drafts, the comments submitted to the Secretariat and the resolution of these comments. The objective is also to keep complete electronic continuity of the successive versions throughout the whole review/revision/approval and publication process.

The electronic publication system aims at facilitating the update and fast availability of electronic versions of the revised safety standards after they have been revised using a topical oriented approach. It also significantly enhances user friendliness with the insertion of dynamic links for the above mentioned three types of relationship. In this regard, it was highlighted that the issue of user friendliness is not restricted to user friendliness of individual standards, but to user friendliness of the whole collection. Furthermore, other types of publications or tools are necessary for user-friendliness in addition to the individual safety standards, published as books, pdf versions and, in the future, other electronic formats. With a top-down development system, the published standards can only indicate the bottom-up relationship (each Safety Guide indicates which requirement it implements). Therefore it is necessary to complement these publications by access, through the NSS-OUI interface to the top-down relationship. This complements other information, such as the overall status file and the whole collection of IAEA Safety Standards in all languages.

Finally, when these different outputs are available, any single part will de facto be linked to a specific topical area in the central database. This creates an easy mechanism to then channel any comment submitted on that part to the corresponding topical area and therefore also to the associated parts of the IAEA Safety Standards, thus streamlining the feedback collection and storage process and expanding the possibilities by providing an opportunity to get feedback from any product linked to the IAEA Safety Standards.

B.6. Other policy discussion

Approaches on quantitative vs qualitative standards and supporting publications

In April 2015, the CSS discussed a policy paper on approaches to quantitative vs qualitative standards. It was noted that there are at present several areas, such as radiation protection and transport, in which the standards provide quantitative criteria, but criteria that are not necessarily very prescriptive. In summary, the policy paper concluded that it was indeed appropriate that quantitative criteria be established in certain areas, but, for requirements that apply for a range of facilities or activities, qualitative and performance-based criteria could be more appropriate, in view of the aim of the standards to be technology neutral and to encourage continuous improvement. Moreover, it was highlighted that it may be challenging to achieve a consensus on quantitative criteria, and on how to measure compliance with such criteria. Nevertheless, it would always be possible to introduce new quantitative criteria if the need arose.

The CSS supported the policy paper on quantitative/qualitative standards and requested that it be incorporated in SPESS A. This resulted in a revision of the SPESS A document issued in November 2015.

B.7. Uses of safety standards in Member States

As a regular agenda item, CSS members have continued to report on the use of IAEA safety standards, and in this fifth term most of the members of the CSS have now reported on the situation in their State. Many members have reported that the structure of their national regulations and the development process used mirror those of the IAEA safety standards. Several trends in the use of the standards can be identified:

- Indirect use of the standards:
  - as a basis for the development and review of national regulations
  - as a reference for the regulatory body in assessing licensing applications
  - via the recent EU directives on nuclear safety and on waste safety
  - as a benchmark for harmonization, e.g. via WENRA reference levels
- Direct use of the standards:
  - adoption of the IAEA Transport Regulations into national law
  - for the safety assessment and licensing of nuclear power plants for which national regulations are not applicable
  - for issue as general guidance to operators, but which is not legally binding
  - in connection with Agency safety review missions

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B.8. Status on the priorities for the fifth term

At its first meeting of the fifth term, in March 2012, the CSS identified 14 topics to be addressed as priorities for its fifth term. These topics, and the status of each, are set out in the table below.

#	Main topics	Status/action
1	Finalization of the General Safety Requirements (including review following the Fukushima Daiichi accident)	Only one of the General Safety Requirements remains to be finalized (GSR Part 2 on Leadership and Management for Safety). It is at the final stage of approval by the Committees
2	Initiation of the revision of the remaining Specific Safety Requirements (including review of other Specific Safety Requirements following the Fukushima Daiichi accident)	DS462 (NS-R-3 Rev. 1, SSR-2/1 Rev. 1 and SSR-2/2 Rev.1) being published. The revision of NS-R-4 for final approval by the Committees. The revision of NS-R-5 submitted to the MS for comments and the revision of NS-R-3 to be submitted to the next meetings of the Committees
3	Enhancing the feedback process	Tools prepared with the NSS-OUI platform
4	Exposure to radon	Draft DS421 published as SSG-32
5	Medical exposure	DS399 approved by the Committees for submission to the CSS
6	Application of the justification principle	DS401 published as GSG-5
7	Harmonization of exemption, clearance criteria and other radionuclide specific criteria	DS458 on consumer products being published and work on other topics to be pursued
8	NORM related issues	DS459 being drafted
9	Occupational radiation protection, including its application to rescuers	DS453 providing general guidance being published. Guidance for rescuers in GSR Part 7 also being published
10	Knowledge management	DS456 (revision of GS-R-3) being finalized and DS462 (revision of GSR-Part 4) being published
11	Regulatory oversight of human and organizational factors	DS462 (revision of GSR Part 1) being published
12	The safety/security interface	Nuclear Security Guidance Committee established in 2012, similar review and approval process

		in place, Interface Group regular consultation on interface documents, harmonization of the TORs of the Committees, guidance for drafter developed and inserted in SPESS C
13	Usefulness of standards for countries embarking on nuclear power programmes	Significantly enhanced with the availability of the NSS-OUI User interface
14	The need for more detail in standards on PSA and severe accident management	The revision of NS-G-2.15 submitted to the Member States for comments

C. RECOMMENDATIONS FOR THE SIXTH CSS TERM

The CSS recommends the following actions for the sixth term:

1) Harmonize safety standards and security recommendations, as well as the IAEA's process for developing them, to facilitate accomplishing the common objective of safety and security - to protect people and the environment. Such harmonization will assist operators, users of radioactive sources, and regulators in accomplishing this common objective. Actionable steps for safety and security harmonization could include:

    - Promoting a common development process for safety standards and security recommendations and associated guidance, including further involvement of the CSS.

    - Consolidating safety standards and security recommendations for radiation source users consistent with the Code of Conduct on the Safety and Security of Radioactive Sources.

    - Consolidating safety standards and security recommendations for transportation of radiation sources and nuclear material consistent with United Nations standards.

    - Continue developing guidance on preparedness for response to nuclear and radiological emergencies irrespective of their initiating cause taking into account both safety and security aspects.

    - Progressing on a common glossary for nuclear security and safety.

2) On the basis of experience gained from existing Review Committees including the newly established EPReSc, perform a review of the safety committees structure and recommend to the DG a future optimum structure that should be adopted to meet the needs of the IAEA Secretariat and Member States for the development of high quality standards and guidance in the most effective and efficient way. Identify options to further enhance the benefit of holding joint sessions of the Review Committees.

3) Undertake a review of the findings in the Director General's Fukushima Daiichi Accident Report and confirm those areas that the safety committees need to continue to focus on, and progress the development of new standards and guidance to address the remaining gaps. These are expected to include, for example, post-emergency recovery procedures, criteria for food, drinking water, non-food commodities and methodology for their development.

4) Develop principles for guiding the prioritization for safety standards development with consideration of operating experience, regulatory experience and results of safety related research.

5) After appropriate pilot testing to demonstrate performance, implement the IT platform for the development, review, dissemination, and revision of IAEA safety standards and security recommendations and associated guidance. Based on early experience in applying the IT platform, utilise its functionality to optimise and enhance the effectiveness and efficiency of the

process for the production of safety standards and security recommendations and associated guidance.

6) Clarify the radiation protection system in exposure situations other than planned exposure situations providing guidance to decision makers and experts on preparing dialogue and elaborating clear messages to stakeholders based on addressing “prevailing circumstances”.

7) Expedite the development of the guidance on transition from emergency situations to recovery situations and the guidance on communication before, during and after an emergency situation.

8) Develop, in cooperation with the relevant international organizations, guidance on health effects incurred from exposure characterized by very low doses and dose rates.

9) Develop input for the Nuclear Security Series on the terms “unacceptable radiological consequences” and “high radiological consequences” that are used as criteria for implementing specific recommendations.

10) Continue the joint MTCD/NS efforts to streamline the approval and publication process and significantly enhance its effectiveness

11) Ensure transparency for both the CSS and the Board of Governors, of the editorial reviews of consensus publications, provide the results of such reviews to the CSS at the latest before final approval of the standards and take steps to limit the need for further changes to approved text.

12) Assist the DDG-NS for the implementation of its nuclear safety strategy and programme of work as requested in the Nuclear Safety Resolution approved at GC(59), to guide the transition after the IAEA Action Plan on Nuclear Safety.

Appendix 1

2007-10-25

TERMS OF REFERENCE

COMMISSION ON SAFETY STANDARDS

The Commission on Safety Standards (CSS) is a standing body of senior government officials holding national responsibilities for establishing standards and other regulatory documents relevant to nuclear, radiation, transport and waste safety.

The CSS has a special overview role with regard to the Agency's safety standards and provides advice to the Director General on the overall programme on regulatory aspects of safety.

Functions

The functions of the CSS are:

- To provide guidance on the approach and strategy for establishing the Agency's safety standards, particularly in order to ensure coherence and consistency between standards;
- To resolve outstanding issues referred to it by the committees involved in the Agency's preparation and review process for safety standards;
- To endorse, in accordance with the Agency's preparation and review process for safety standards, the texts of the Safety Fundamentals and Safety Requirements to be submitted to the Board of Governors for approval and to determine the suitability of Safety Guides to be issued under the authority of the Director General;
- To provide general advice and guidance on safety standards issues, relevant regulatory issues and the Agency's safety standards activities and related programmes, including those for promoting the worldwide application of the standards.

Membership

- Member States will be requested to nominate senior officials holding responsibilities in national regulatory organizations and having recognized expertise in nuclear, radiation, transport and waste safety as candidates. In appointing the CSS members, the Director General will seek to ensure a balance of regional approaches and experience in the areas covered by the Agency's safety standards. The Director General will appoint the members for a term of four years. The members may each be accompanied by one technical adviser when attending the CSS meetings. In addition the Chairpersons of the four committees on safety standards will be invited to participate fully in the CSS meetings.
- Observers from specialized international organizations and relevant non-governmental bodies may be invited by the Director General to attend CSS meetings.
- The Deputy Director General, Department of Nuclear Safety and Security, or a designated substitute will participate in all CSS meetings.

Working Methods

- The Director General will appoint a Chairperson from among the CSS members for a four year term.
- A Scientific Secretary to serve the CSS will be designated by the Deputy Director General, Department of Nuclear Safety and Security.
- Ordinarily, the CSS will meet twice a year for up to five working days. Extraordinary meetings may be called as required.
- The CSS will submit an annual report on its work to the Director General.
- Meetings will be conducted in English.

Resources

- The Secretariat will provide all the resources necessary to permit the efficient working of the CSS.
- All costs involved in the participation of each CSS member, including travel and per diem expenses, will be borne by the nominating Member State.

Appendix 2

Commission membership and evolution for the period 2012-2015

Members

Argentina	Mr Abel J. González
Australia	Mr C.-M. Larsson
Belgium	Mr J.-P. Samain
Brazil	Mr I. P. Salati De Almeida
Canada	Mr R. Jammal
China	Mr Jun YU
Czech Republic	Ms D. Drábová (Chairperson)
Finland	Mr L. Reiman and then Mr P. Tiippana
France	Mr A.-C. Lacoste and then Mr J.-L. Lachaume
Germany	Mr A. Vorwerk
India	Mr S.S. Bajaj and then Mr S.A. Bhardwaj
Israel	Mr M. Markovits
Japan	Mr K. Nakamura and then Mr T. Fuketa
Korea, Republic of	Mr C.-H. Yun and then Mr Y.H. Kim
Lithuania	Mr M. Demčenko
Malaysia	Mr R. Raja Adnan and then Mr H. Mohd Ali
Morocco	Ms I. Soufi
Pakistan	Mr M.A. Habib
Russian Federation	Mr V.S. Bezzubtsev and then Mr A. Ferapontov
South Africa	Mr C.O. Phillips
Spain	Mr A. Gurguí Ferrer
Sweden	Mr I. Lund
United Arab Emirates	Mr W. Travers
United Kingdom	Mr M. Weightman, then Mr Patchett and then Mr A. Hall
United States of America	Mr M. Virgilio and then Mr M. Weber
Chairs of the Review Committees:	
EPReSC	Ms A. Heinrich
NSGC	Mr G. Emi-Reynolds and then Mr B. Dal

NUSSC	Mr F. Feron
RASSC	Mr G. Massera
TRANSSC	Mr W. Brach and then Mr P. Hinrichsen
WASSC	Mr G. Williams

Observers

AdSec Representative	Mr A. Raja Adnan and then Mr R. Awad
EC Representative	Mr P. Faross and then Mr. M. Garribba
ICRP Representative	Ms C. Cousins
INSAG Representative	Mr R. Meserve
OECD/NEA Representative	Mr U. Yoshimura and then Mr K. Shimomura

Appendix 3

Safety Standards endorsed in the period 2012-2015[1]

DS439/NS-R-5 (Rev.1): Safety of Nuclear Fuel Cycle Facilities (2014)

DS450/GSR Part 6: Decommissioning of Facilities (2014)

DS462: Revision through addenda of GSR-Part 1, NS-R-3, SSR-2/1, SSR-2/2 and GSR Part 4: coordination (DS462), GSR Part 1 (DS463), NS-R-3 (DS464), SSR-2/1 (DS465) and GSR Part 4 (DS466), SSR-2/2 (DS467)

DS457/GSR Part 7: Preparedness and Response for a Nuclear or Radiological Emergency (2015)

DS356/SSG-29: Near Surface Disposal Facilities for Radioactive Waste (2014)

DS357/SSG-31: Monitoring and Surveillance of Radioactive Waste Disposal Facilities (2014)

DS360: Safety of Nuclear Fuel Reprocessing Facilities

DS367/SSG-30: Safety Classification of Structures, Systems and Components in Nuclear Power Plants (2014)

DS381: Safety of Nuclear Fuel Cycle Research and Development Facilities

DS401/GSG-5: Justification of Practices, Including Non-Medical Human Imaging (2014)

DS407/SSG-27: Criticality Safety in the Handling of Fissile Material (2014)

DS421/SSG-32: Protection of the Public Against Exposure Indoors due to Radon and Other Natural Sources of Radiation (2015)

DS425/SSG-26: Advisory Material for the IAEA Regulations for the Safety Transport of Radioactive Material, 2012 Edition (2014)

DS429/GSG-4: Use of External Experts by the Regulatory Body (2013)

DS430: Design of Electric Power Systems for Nuclear Power Plants (revision of NS-G-1.8)

DS431: Design of Instrumentation and Control Systems for Nuclear Power Plants (revision of NS-G-1.1 and NS-G-1.3)

DS433/SSG-35: Site Survey and Site Selection for Nuclear Installations (2015)

DS436/SSG-37: Instrumentation and Control Systems and Software Important to Safety for Research Reactors (2015)

DS441/SSG-38: Construction for Nuclear Installations (2015)

DS446/SSG-28: Commissioning for Nuclear Power Plants (2014)

DS447: Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities (revision of WS-G-2.6)

DS448: Predisposal Management of Radioactive Waste from Nuclear Power Plants and Research Reactors (revision of WS-G-2.5)

DS451/TS-G-1.6 (Rev.1): Schedule of Provisions of the IAEA Regulations for the Safe Transport of Radioactive Material (2009 Edition) (2014)

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[1] Dates in brackets, where present, are the date of publication.

DS453: Occupational Radiation Protection (revision and combination of RS-G-1.1, RS-G-1.2, RS-G-1.3, RS-G-1.6 and GS-G-3.2)

DS458: Radiation Safety for Consumer Products

DS460: Communication and Consultation with Interested Parties by the Regulatory Body

DS461/SSG-33: Schedules of Provisions of the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition) (2015)

Appendix 4

DPPs approved in the period 2012-2015[2]

DS462: Revision through addenda of GSR-Part 1, NS-R-3, SSR-2/1, SSR-2/2 and GSR Part 4: coordination (DS462), GSR Part 1 (DS463), NS-R-3 (DS464), SSR-2/1 (DS465) and GSR Part 4 (DS466), SSR-2/2 (DS467)

DS476: Safety of Research Reactors (revision of NS-R-4)

DS478: Safety of Nuclear Fuel Cycle Facilities (revision of NS-R-5 (Rev.1))

DS484: Site Evaluation for Nuclear Installations (revision of NS-R-3 (Rev.1))

DS399: Radiation Protection and Safety in Medical Uses of Ionizing Radiation (revision of RS-G-1.5) (revised DPP approved)

DS421/SSG-32: Protection of the Public Against Exposure Indoors due to Radon and Other Natural Sources of Radiation (2015) (revised DPP approved)

DS449: Content of the Safety Analysis Report for Nuclear Installations (revision of GS-G-4.1)

DS458: Radiation Safety for Consumer Products

DS459: Management of Radioactive Residues from Mining, Mineral Processing, and other NORM Related Activities (revision of WS-G-1.2)

DS460: Communication and Consultation with Interested Parties

DS461/SSG-33: Schedules of Provisions of the IAEA Regulations for the Safe Transport of Radioactive Material (2012 Edition) (2015)

DS468: Remediation Process for Areas with Residual Radioactive Material (revision of WS-G-3.1)

DS469: Planning and Preparing for Emergency Response to Transport Events Involving Radioactive Material (revision of TS-G-1.2)

DS470: Radiation Safety of Radiation Sources used in Research and Education

DS471: Radiation Safety of X-ray Generators and Sources Used for Inspection Purposes and for Non-Medical Imaging

DS472: Organization, Management and Staffing of a Regulatory Body for Safety (revision and combination of GS-G-1.1, part of GS-G-1.5, GSG-4 and DS113 and DS460)

DS473: Functions and Processes of the Regulatory Body for Safety (revision and combination of GS-G-1.2, GS-G-1.3, GS-G-1.4, part of GS-G-1.5, part of SSG-12 and part of WS-G-5.1)

DS474: Arrangements for the Termination of a Nuclear of Radiological Emergency

DS475: Arrangements for Public Communications in Preparedness and Response for a Nuclear or Radiological Emergency

DS477: The Management System for the Predisposal and Disposal of Radioactive Waste (revision and combination of GS-G-3.3 and GS-G-3.4)

DS479: Operating Experience Feedback for Nuclear Installations (revision of NS-G-2.11)

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[2] Dates in brackets, where present, are the date of publication.

DS481: Design of the Reactor Coolant System and Associated Systems in Nuclear Power Plants (revision of NS-G-1.9)

DS482: Design of Reactor Containment Systems for Nuclear Power Plants (revision of NS-G-1.10)

DS483: Severe Accident Management Programme for Nuclear Power Plants (revision of NS-G-2.15)

DS485: Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants (revision of NS-G-2.12)

DS486: Establishing the Safety Infrastructure for a Nuclear Power Programme (revision of SSG-16)

DS487: Design of Fuel Handling and Storage Systems for Nuclear Power Plants (revision of NS-G-1.4)

DS488: Design of the Reactor Core for Nuclear Power Plants (revision of NS-G-1.12)

DS489: Storage of Spent Nuclear Fuel (revision of SSG-15)

DS490: Seismic Design and Qualification for Nuclear Power Plants (revision of NS-G-1.6)

DS491: Deterministic Safety Analysis for Nuclear Power Plants (revision of SSG-2)

DS492: Human Factors Engineering in Nuclear Power Plants

DS493: Package Design Safety Reports for the Transport of Radioactive Material (amendment and addendum to TS-G-1.5)