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1. GENERAL ISSUES

1.1 Opening of the Meeting

The meeting was opened by Mr. G. Rzentkowski (DIR-NSNI). G. Rzentkowski listed several topics that deserved special attention and could be discussed in NUSSC:

- The principles of the design of new installations. This refers in particular to the concepts of "plant design envelope", "design extension conditions" and "practically eliminated conditions";
- The concept of safety goals and approaches to fix them. The IAEA is preparing a TECDOC on the subject;
- Sites with multiple units;
- Decision making taking into account deterministic and probabilistic methods (integrated risk informed decision making (IRIDM)). INSAG-25 (2011) deals with the subject but in too general a manner;
- The graded approach, in particular for design requirements and regulatory processes, is applicable to small modular reactors (SMRs);
- The continued operation of nuclear power plants (Long Term Operation - LTO). More and more operators are considering continuing operation, sometimes up to 80 years. In addition to aging management, it is also necessary to determine which safety improvements are reasonably achievable.

He highlighted some of the agenda items:

- The revision Safety Standards based on the Fukushima Daiichi motivated, in particular, by the teachings of the TEPCO Fukushima Dai-ichi accident lessons learned;
- The innovative approach to the revision of 8 Safety Guides on the operation of nuclear power plants (DS497DPP).

1.2 Chairman’s Introduction

Chairman mentioned, in terms of safety standards, only few documents are on the agenda (annex I). However the project of guide on containment and of DPP on the revision of eight closely interrelated Safety Guides will certainly give rise to interesting discussions.

The NUSSC Chairman stressed that the presentation/demonstration of the IT platform will be an opportunity to understand the possibilities of this system and the help it could bring to the development of safety standards.

Finally four points on the agenda will probably be of interest for the NUSSC:

- The published TECDOC which shed light on SSR-2/1;
- The definition of levels of defence-in-depth;
- The TECDOC project on safety objectives for new installations; and
- The case Study for the Deployment of a Factory Fuelled Small Modular Nuclear Reactor.
1.3 Adoption of the Agenda of the 41\textsuperscript{th} NUSSC Meeting

The Agenda of the 41\textsuperscript{th} NUSSC Meeting was approved.

1.4 Approval of the Report of the 40\textsuperscript{th} NUSSC Meeting

The report of the 40\textsuperscript{th} NUSSC Meeting was adopted.

1.5 Actions of NUSSC Meetings

The progress made on the actions decided at the 40\textsuperscript{th} NUSSC Meeting was presented by Mr. M. Svab, NUSSC Scientific Secretary. The actions were either already performed or dealt with during the NUSSC Meeting.

1.6 Dates of the next meetings

The dates of the next NUSSC Meetings were confirmed:
- The 42\textsuperscript{th} NUSSC Meeting will be held on 28 November – 2 December 2016.

1.7 Report from the previous meeting of the five Chairs

Prior to the 41\textsuperscript{th} CSS Meeting, a meeting of the five Chairs of the review committees was held. The new Chairs of NSGC (Mr. Bart Dal) and of EPRExC (Ms. Ann Heinrich) participated in the meeting. The discussions focused on:
- The departure of the WASSC scientific secretary and the forthcoming appointment of EPRExC scientific secretary;
- The current meeting of INSAG that should result in the expansion of its scope beyond NPPs.
- DS452, DS454 and DS453 which should undergo a joint revision by the CSS but which has been delayed as only one of those guides was proofread by the Technical Editors.
- The timing of Technical Editors proofreading of safety standards projects as such proofreading may occur after the review by the SSCs committees. Thus participants acknowledge the necessity to inform the committees in case of modifications of the text and to reinforce the use of SPESS according to which the proofreading should take place before the 2nd review by the SSCs committees;
- The possible consequences on CSS priorities on its new mandate; and
- The computer tool NUCLEUS/NSS-OUI IT Platform.

The IAEA highlighted the fact that 3 projects of guides (DS485 Ageing Management and Development of a Programme for Long Term Operation of NPPs; DS472 Organization, Management and Staffing of a Regulatory Body for Safety; DS473 Functions and Processes of the Regulatory Body for Safety) had been removed from the agenda of the SSCs’ Meetings as they did not undergo the Technical Editors Proofreading. One solution could be to ask for comments for the next NUSSC Meeting but to approve these documents only during the following one.

The IAEA emphasized that during NUSSC preparation, the Agency is only granted with a few weeks to process comments received – sometimes numerous. One option could be to review SPESS in order to increase this time for the Agency.
1.8 CSS 39th Meeting Report

The report was introduced by Mr. D. Delattre, CSS Scientific Secretary. The 39th Meeting of CSS was the first meeting of the current term. The following points were discussed:

- The progress made in the implementation of the long-term structure of safety standards;
- A reminder on the SPESS tool (Strategies and Processes for the Establishment of IAEA Safety Standards);
- A report on the previous mandate and the objectives of the current one. Discussions mainly revolved around the progress toward a better interface between safety and security and the possibility to draft a document on joint safety and security fundamentals. The new priorities will be clarified for the next meeting to be formally adopted;
- The moment on which Technical Editors need to conduct a proofreading of the safety standards projects;
- The possible consequences of the UNSCEAR Report « Attributing Health Effects to Ionizing Radiation Exposure and Inferring Risks » on safety standards (RASSC Action);
- The need from NSGC to receive guidance on values for the criteria ‘unacceptable radiological consequences’ and ‘high radiological consequences’ for implementing specific recommendations in the area of nuclear security.

CSS approved the following Safety Guides:

- **DS456** Leadership and Management for Safety (Safety Requirements) (revision of GS-R-3);
- **DS476** Safety of Research Reactors (Safety Requirements) (revision of NS-R-4).
- **DS399**: Draft Safety Guide on Radiation Protection and Safety in Medical Uses of Ionizing Radiation (revision of RS-G-1.5)
- **DS454**: Draft Safety Guide on Predisposal Management of Waste from the Use of Radioactive Material in Medicine, Industry, Research, Agriculture and Education (revision of WS-G-2.7)
- **DS455**: Draft Safety Guide on Establishing a National Radiation Safety Infrastructure

CSS approved the following DPPs:

- **DS494 DPP** Protection against Internal Hazards in the Design of Nuclear Power Plants (revision and combination of NS-G-1.7 and NS-G-1.11) (Safety Guide).
- **DS495 DPP**: Draft Safety Requirements on Regulations for the Safe Transport of Radioactive Material, 20xx Edition (revision of SSR-6)

The IAEA also demonstrated the practical use of its new IT tool (IT Platform called “OUI”) for the preparation and the publication of safety standards. The IAEA insisted on the functionalities expected and their relevance for preparing and using safety standards.


The IAEA recalled the objective of the IT system (IT platform and “OUI” On-line User Interface) to facilitate the compilation of experience feedback regarding the implementation of safety standards and documents of the Nuclear Security Series, the review of this feedback, as well as of standards or
documents, their update and publication. Then a demonstration of the functionalities of the IT Platform was carried out.

The system aims at:
- Facilitating the access to safety standards and thus the requirements or recommendations they encompass, including by various search methods (by number, by subject, by key word, by type of installation/activity, by phase in the life of an installation);
- Facilitating the semantic consistency between publications (terminology of the safety and security glossaries);
- Facilitating the technical consistency between publications, including as a result of the recent publication of a new standard;
- Facilitating the links between requirements and recommendations;
- Actualizing the links between different safety standards and, therefore, identifying the consequences of developments made or considered to one of these standards;
- Collecting the needs for changes by publication, requirement or recommendation, regardless of their origin.

All the safety standards have been uploaded and are available via OUI. However, some are only links to the publication (pdf) while others have been processed paragraph by paragraph before the insertion of metadata and links.

The system is available on Nucleus (https://nucleus-apps.iaea.org/nss-oui) even if all features are not yet operational.

The IAEA made a demo on the research abilities of the tool. The feedback mechanism should be available before the end of summer 2016.

**NUSSC confirmed the interest of this IT tool**
2. REVIEW OF IAEA SAFETY STANDARDS

2.1 DS495 Regulations for the Safe Transport of Radioactive Material, No.SSR-6, 20xx Edition (Specific Safety Requirements)

The DPP was approved in spring 2016 and DS495 is a revision of SSR-6 (2012). Prior to the NUSSC meeting a comparative table between DS495 and SSR-6 was available on the SSCs’ website. Only few comments were made before the NUSSC Meeting. TRANSSC, which convened last week, gave its approval for submission to Member States.

⇒ NUSSC gave its approval for submission to Member States of DS495.

2.2 DS474 Arrangements for the Termination of a Nuclear or Radiological Emergency (Safety Guide)

The DPP was approved at the end of 2013. Only a dozen of comments were received on this document. This document covers Requirement 18 of GSR Part 7 (2015) and Requirement 46 of GSR Part 3 (2011). Six Consultancy meetings and a Technical meeting were convened to draft this guide and an ad-hoc working group was created under the framework of the Inter-Agency Committee on Radiological and Nuclear Emergencies.

Half of the guide is composed of an annex on case studies:
- the Fukushima Daiichi accident (2011),
- the 4 radiological accident in Goiânia, Brazil (1987),
- the Paks fuel damage incident in Hungary (2003) and
- the incident involving a stolen radioactive source in Hueypoxtla, Mexico (2013).

Three-fourth of the comments rose before NUSSC was accepted. The rejected comments were on:
- The absence of detailed guidance on public communication. The IAEA underscored that DS475 already addresses this subject in details.
- Proposed deletion of redundant paragraphs. For the IAEA those superfluous paragraphs were kept for clarity as primarily requested by Member States in various occasions.

The updated version of DS474 and the table of comments and resolutions were available on the SSCs’ website before the NUSSC meeting.
The 3rd EPRReSC meeting will take place the week of 28 November 2016.

⇒ NUSSC gave its approval for submission to Member States on DS474.

2.3 DS482 Design of Reactor Containment Systems for Nuclear Power Plants (Safety Guide)

The DPP was approved in spring 2014. DS482 is a revision of NS-G-1.10 (2004).

The objective of this Safety Guide is to take into account provisions of SS-R 2/1 Rev.1, for example by considering the concept of practical elimination of conditions that could lead to an early radioactive release or to a large radioactive release.
The IAEA described the document’s structure and the main modifications made to it, principally the suppression of annexes 1 and 2 of NS-G-1.10 and the insertion of a short appendix on plants designed with earlier standards.

The updated version of DS482 and the table of comments and resolutions were available on the SSCs’ website before the NUSSC meeting.

Most of the comments made on the document aimed at improving the clarity of recommendations even if some of them concerned the scope of the document and in particular the link with the requirements of SSR-2/1.

During the meeting, discussions aroused on:
- The interest of having an appendix on plants designed with earlier standards.
- The insertion of paragraphs on the management of situations in which the cooling of corium in-vessel failed. According to the document if such situation would lead to an early radioactive release or to a large radioactive release, it should be avoided. Moreover, recommendations on the subject would be more appropriately incorporated in the guide on the management of major accident (see §5.30, SSR-2/1: “In particular, the containment and its safety features shall be able to withstand extreme scenarios that include, among other things, melting of the reactor core”). Finally, this guide could insist on the fact that the choice of an ex-vessel or in-vessel retention strategy is essential to the design of the installation and in particular of the confinement building.
- Reference to NS-R-3 (or SSR-1) and the resulting guides for the list of external hazards to be considered. IAEA reckon it to be the better solution and NUSSC confirmed.
- Considering design extension conditions, venting should be used at a last resort mean.
- The risks of hydrogen detonation/ deflagration in case of a leak in the primary containment (§4.124).
- The follow up on some comments made by Germany or ENISS (in particular on the wording “design bases”).
- The interest to keep or suppress the appendix.

⇒ NUSSC gave its approval for submission to Member States of DS482 with emphasis on the choice of retention and cooling strategy (in-vessel/ out-vessel) of corium. Concerning appendix 1, it will be incorporated in DS482 for Member States consultation.

2.4 DS488 Design of the Reactor Core for Nuclear Power Plants (Safety Guide)

The DPP was approved at the end of 2014 and DS488 is a revision of NS-G-1.12 (2005).

The updated version of DS488 and the table of comments and resolutions were available on the SSCs’ website before the NUSSC meeting.

During the meeting discussions were about:
- The level of detail of the guide and the recourse to footnotes. IAEA recalled that footnotes and annexes are not, contrarily to the appendixes, formally part of the document.
- The fact that the guide is already quite short (about 50 pages) and that is not essential to keep reducing its length.

IAEA reckoned that a few short footnotes won’t be detrimental to the readability of the document.

⇒ NUSSC gave its approval for submission to Member States of DS482 if the IAEA make sure that information explaining the requirements have been introduced in footnotes (if they do not exceed a few lines) or in annexes to keep this document “user friendly” (the choice between this two options, or the recourse to both of them will be made by the IAEA).
2.5 DS491 Deterministic Safety Analysis for Nuclear Power Plants (Safety Guide)

The DPP was approved in spring 2015 and DS491 is an update of SSG-2 (2009). The updated version of DS491 and the table of comments and resolutions were available on the SSCs’ website before the NUSSC meeting. More than 400 comments were made. Majority of them aimed at enhancing the clarity of the document and 2/3 were accepted.

IAEA highlighted the current practice in some Member States to give credit in the safety analysis to the availability of non-permanent equipment after, for example, 8 hours for equipment stored on-site or 72 hours for equipment stored off the site.

During the meeting, they were discussions on:

- Criteria which relate to radiological consequences (§4.5) and the possibility for them to be qualitative. It was proposed to underscore the fact that the objectives are fixed by the regulatory body and are usually of a quantitative nature.
- Criteria of §4.5 on barriers.
- Availability of non-permanent equipment. It was suggested to insist on the fact that the time claimed is realistic in the considered accident given conditions and any shorter time claimed should warrant special attention and in any case time claimed should be justified.

NUSSC gave its approval for submission to Member States of DS491 after §7.51 and §7.64 have been rephrased.

“Non-permanent systems and equipment should not be considered for demonstration of adequacy of the nuclear power plant design. Such equipment is typically considered to operate for long term sequences and is considered available in accordance with the emergency operating procedures or accident management guidelines. The time claimed for availability of non-permanent equipment should be justified#.

# Current practice in some Members States is that credit is given in the safety analysis to the availability of non-permanent equipment after, for example, 8 hours for equipment stored on-site or 72 hours for equipment stored of-site.”

2.6 Status of Safety Standards

A presentation on the status of safety standards was given by Mr. M. Svab.

The following safety standards were published by the IAEA since the previous NUSSC Meeting or were close to publication:

- GSR Part 1, Rev.1 Governmental, Legal and Regulatory Framework for Safety
- GSR Part 2 Leadership and Management for Safety
- GSR Part 4, Rev.1 Safety Assessment for Facilities and Activities
- NS-R-3, Rev.1 Site Evaluation for Nuclear Installations
- SSR-2/1, Rev.1 Safety of Nuclear Power Plants: Design
- SSR-2/2, Rev.1 Safety of Nuclear Power Plants: Commissioning and Operation
- SSG-34 Design of Electrical Power Systems for Nuclear Power Plants
- SSG-39 Design of Instrumentation and Control Systems for Nuclear Power Plants
- SSG-40 Predisposal Management of Radioactive Waste from Nuclear Power Plants and Research Reactors
- SSG-41 Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities

To date, in terms of safety standards, the situation may be summarized as follows:
The IAEA detailed the progress made on the development of safety standards with respect to the 14 steps of preparation and review process of a draft safety standard (SPES B). The IAEA made reference to documents to be reviewed by NUSSC, i.e. those that are at steps 2, 6 and 10, as well as the planned/projected time frames for the consultation of NUSSC.

→ **NUSSC confirmed the value of this information.**

Some NUSSC Members recalled that NUSSC identified Safety Guides as a priority impacted by the lessons learned from the Fukushima Daiichi NPP accident:

<table>
<thead>
<tr>
<th>NUSSC Meeting</th>
<th>Conclusion on the prioritization</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUSSC 34</td>
<td>NS-G-1.9</td>
<td>Reactor cooling system, DS481, DPP approved; potential first review at NUSSC 42</td>
</tr>
<tr>
<td></td>
<td>NS-G-1.10</td>
<td>Containment, DS482, DPP approved; first review during NUSSC 41</td>
</tr>
<tr>
<td></td>
<td>NS-G-2.15</td>
<td>Severe accident, DS483, DPP approved; consultation of Member States closed</td>
</tr>
<tr>
<td>NUSSC 35</td>
<td>NS-G-1.6</td>
<td>Seismic design and qualification, DS490, DPP approved; potential first review at NUSSC 42</td>
</tr>
<tr>
<td></td>
<td>SSG-2</td>
<td>Deterministic safety analysis, DS491, DPP approved; first review at NUSSC 41</td>
</tr>
<tr>
<td></td>
<td>NS-G-1.5</td>
<td>DPP on the agenda of NUSSC 42</td>
</tr>
<tr>
<td>NUSSC 36</td>
<td>SSG-15</td>
<td>Spent fuel storage, DS489, DPP approved; potential first review at NUSSC 42</td>
</tr>
<tr>
<td></td>
<td>SSG-16</td>
<td>Establishing the Safety Infrastructure for a Nuclear Power Programme (Rev.1), DS486, DPP approved, MS consultation closed, potential second review at NUSSC 42</td>
</tr>
</tbody>
</table>
The IAEA also posted on the website of NUSSC a document on the status of TECDOCs and Safety Reports under development.

→ According to NUSSC informing Member States about the drafting of TECDOCS is beneficial.

3. REVIEW OF DOCUMENT PREPARATION PROFILES (DPPs) – SAFETY STANDARDS

3.1 DS497 DPP Revision of eight closely interrelated Safety Guides: NS-G-2.2 to 2.8 and NS-G-2.14 (Safety Guides)

This DPP aims at merging and revising Safety Guides from NS-G-2.2 to 2.8 and NS-G-2.14:
- NS-G-2.2 Operating Limits & Conditions (2000)
- NS-G-2.3 Modifications (2001)
- NS-G-2.4 Operating Organization (2001)
- NS-G-2.5 Core Management & Fuel Handling (2002)
- NS-G-2.6 Maintenance, Surveillance & In Service Inspection (2002)
- NS-G-2.7 Radiation Protection & Waste Management (2002)
- NS-G-2.8 Recruitment, Qualification & Training (2002)

After recalling that DS483 is a revision of the guide on severe accident management programme for NPPs, the IAEA indicated that another DPP should be drafted to revise and extend the scope of NS-G-2.1 on fire safety (2000) to cover other external and internal hazards.

This DPP takes into account the updated version of SSR-2/2 and the experience feedback from numerous OSART missions.

The IAEA proposed to simultaneously revise those guides. This revision would be a transitional step waiting for a complete reorganisation of the guides’ collection on NPP operation. This approach was considered during a Technical Meeting in November 2015 which permits the identification of subjects that should be found in all guides and some subjects specifically related to certain guides.

Prior to the NUSSC Meeting 46 comments were received, the majority of which were accepted in full.

During the meeting, there were discussions on:
- How to approach the revision of the 8 documents. IAEA informed the participants about the creation of three working groups.
- The interest of being more specific about the parts of the guides that will undergo modifications, as it was the case for DS462. For the IAEA the road map deduced from the Technical Meeting conclusions is relatively clear. The Agency indicated that it will conduct homogenous updating, thus avoiding a total revision of one guide while the others are submitted only to a partial one.
- The coherence of all guides and their internal coherence once they have been updated.
- The possible utilization of those guides for SMR, knowing that SSR-2/2 has no provision regarding SMR. IAEA recognised that there are different types of SMR with different powers and the Agency will kept a “pragmatic approach” towards those reactors.

➔ NUSSC considers this initiative to be ambitious but is in favour of it.
➔ NUSSC reminds the IAEA to be cautious on the insertion of provisions specific to SMR. Those provisions shall in any case be coherent with SSR-2/2 requirements.
➔ Drawing on the experience acquired with DS462, NUSSC invites the IAEA to clarify which parts of the guides will be updated, for drafters and comments from consultancy meetings and Member States to focus on those parts. NUSSC gave its approval for transmission to the CSS of the DPP of DS497 with an annex clarifying which parts are supposed to be updated.
➔ NUSSC wishes the IAEA to inform it regularly of the progress made on the drafting of DS497

4. SAFETY STANDARDS FOR INFORMATION

4.1 DS427 Prospective Radiological Environmental Impact Assessment for Facilities and Activities (Safety Guide)

DS427, DS432 and DS442 were simultaneously elaborated because of tight connections. NUSSC gave approval on DS427 during the last meeting and transmit the document to the CSS. However, this version of DS427 did not go through a proofreading by Technical Editors at that time. This proofreading finally took place a few days before the meeting and the revised version was made available on the IAEA website. During its last meeting, information on this document was furnished to the CSS.

➔ NUSSC takes note of the new version. The members of the NUSSC can still make comments on it until the end of July 2016 but those comments should only be made if a Member considers that the content has been modified by the proofreading. The IAEA explained that comments will be addressed on a bilateral basis.

4.2 DS432 Radiation Protection of the Public and the Environment (Safety Guide)

The situation is similar to DS427’s one.
➔ Same conclusions as the ones for DS427

4.3 DS442 Regulatory Control of Radioactive Discharges to the Environment (Safety Guide)

The situation is similar to DS427’s one.
➔ Same conclusions as the ones for DS427
5. NSGC DOCUMENTS FOR CLEARANCE

5.1 NST009 Building Capacity for Nuclear Security (Implementing Guide)

The updated version of NST009 and a table introducing the actions taken on the comments received were posted on the IAEA website shortly before the meeting. The NUSSC cleared this version as no discussion aroused during the NUSSC Meeting.

➔ NUSSC gives its clearance for submission of NST009 to DDG-NS

5.2 NST041 Preventive and Protective Measures against Insider Threats (Implementing Guide)

The updated version of NST009 and a table introducing the actions taken on the comments received were posted on the IAEA website shortly before the meeting. No discussion on this document aroused during the NUSSC Meeting.

➔ NUSSC gives its clearance for submission of NST041 to DDG-NS

5.3 NST058 DPP Development, Use and Maintenance of Threat Assessment and Design Basis Threat (Revision of NSS No. 10) (Implementing Guide)

This DPP is a revision of NSS No.10 (2009). Prior to the NUSSC Meeting, around ten comments were received but none from a NUSSC Member State. One question was raised on the responsibility of States beyond design basis threat.

➔ NUSSC gave clearance for the development of the DPP of NST058

6. MISCELLANEOUS

6.1 TECDOC on Development and Application of a Framework of Safety Goals for Nuclear Installations

The Agency has launched the actions to draft this TECDOC with two Technical Meetings and three Consultancy Meetings that have already been organized. The objective of this document is to promote a greater harmonization of the use of Safety Goals.

The discussion revolved around:
- The due date for this TECDOC. For the IAEA this document is a priority as it could serve as a basis for the elaboration of a future safety guide.
- The use of this TECDOC in particular under the revision of safety standards.
- The meaning to be granted to “safety goals” and the need for it to be understood in an homogenous manner, which does not seems to be the case for now. An issue arose on the difference to make between “safety goals” and other concepts as “safety objectives”, “safety requirements” or “safety criteria”.

NUSSC noted that there was not a strong link between this TECDOC and the Safety Standards.
Once the TECDOC published, NUSSC would welcome a presentation and discussion on potential impact on IAEA Safety Standards.

6.2 Information on the TECDOC 1791 on Considerations for the Application of the IAEA Safety Requirements for Design of NPPs

The Agency finalised the drafting of TECDOC 1791 which was published during spring 2016. It aimed at facilitating the understanding of SSR-2/1. NUSSC contributed to its drafting. It will constitute a basis for the revision of Safety Guides such as the one for containment and reactor coolant systems.

This document introduced the notion of “plant design envelope”, recognizes the existence of diverse interpretation on the levels of defence in depth and gives clarification on the concept of “practical elimination”.

IAEA is considering developing a Safety Guide to address some cross cutting aspects which might be very difficult to cover in individual safety guides (e.g. demonstration of practical elimination of large/early releases, independence of safety provisions for D-i-D…)

NUSSC members expressed various points of view on the benefits of a Safety Guide and the ability, within the coming years, to actually get a consensus on its contents.
NUSSC did not agree nor disagree on the development of a DPP by IAEA. Wait and see the draft DPP, if any.

The Agency reminded the participants that a Technical Meeting on Novel Design and Safety Principles of Nuclear Power Plants will be held from 3 – 6 October 2016.
6.3 Defence-in-Depth level definitions – options to progress

Both, TECDOC No.1791 and the OECD/NEA Green Booklet on defence-in-depth after Fukushima Dai-ichi Accident, highlighted the diverse approaches of Member States. The table (see TECDOC No.1791) below summarizes the two approaches:

<table>
<thead>
<tr>
<th>Level of defence Approach 1</th>
<th>Objective</th>
<th>Essential design means</th>
<th>Essential operational means</th>
<th>Level of defence Approach 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Prevention of abnormal operation and failures</td>
<td>Conservative design and high quality in construction of normal operation systems, including monitoring and control systems</td>
<td>Operational rules and normal operating procedures</td>
<td>Level 1</td>
</tr>
<tr>
<td>Level 2</td>
<td>Control of abnormal operation and detection of failures</td>
<td>Limitation and protection systems and other surveillance features</td>
<td>Abnormal operating procedures/emergency operating procedures</td>
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<tr>
<td>3a</td>
<td>Control of design basis accidents</td>
<td>Engineered safety features (safety systems)</td>
<td>Emergency operating procedures</td>
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<tr>
<td>3b</td>
<td>Control of design extension conditions to prevent core melting</td>
<td>Safety features for design extension conditions without core melting</td>
<td>Emergency operating procedures</td>
<td>Level 4</td>
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<td>4</td>
<td>Control of design extension conditions to mitigate the consequences of severe accidents</td>
<td>Safety features for design extension conditions with core melting</td>
<td>Complementary emergency operating procedures/ severe accident management guidelines</td>
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<td>5</td>
<td>Mitigation of radiological consequences of significant releases of radioactive materials</td>
<td>On-site and off-site emergency response facilities</td>
<td>On-site and off-site emergency plans</td>
<td>Level 6</td>
</tr>
</tbody>
</table>

➔ NUSSC acknowledges that differences exist, although the main part of the table is unique. The main consequence is on what independence is expected/required between equipment used for different levels of DiD.

➔ When updating the Safety Guides, one option could be to refer to plant states rather than to the level of DiD. This option is currently used in DS482 and DS488. After MS consultation, NUSSC will see whether such option is practicable.

6.4 Overview of INPRO “Case Study for the Deployment of a Factory Fuelled Small Modular Nuclear Reactor”

INPRO stands for International Project on Innovative Nuclear Reactors and Fuel Cycles. The project was first launched in 2001 with a General Conference resolution. In 2016, INPRO Membership has grown to 42 Members.

INPRO aims at performing four tasks concerning: global scenarios, innovations, sustainability assessment and strategies and dialogue and outreach. The second one on “innovations” is concerned with a project on transportable NPP in which falls the case study for the deployment of factory fuelled small sized reactor.

The overall objective of the project is to examine, in some detail, legal and institutional issues for export deployment of a transportable nuclear power plant (TNPP) with a factory fuelled and tested reactor and to investigate other aspects of transportable and modular reactor facilities.

There is currently 7 participating countries: Armenia, Finland, France, Indonesia, Romania, Russia, USA and 5 Consultants’ Meetings were already held in 2015-2016.

Member State’s experts proposed 3 case studies:

- Case Study 1 - Factory fuelled sub-surface marine-based SMR (France)
- Case Study 2 - Factory fuelled floating SMR (Russia)
- Case Study 3 - A small land-based factory fuelled transportable SMR (TBD –formerly Canada)

A TECDOC is currently being drafted and is supposed to be published in 2018.
During the meeting, discussions aroused on:
- The reactors power
- The interest for NUSSC to know about and potentially to discuss the conclusions achieved on parts of the TECDOC concerning: the Licensing steps for the service facility, transport and the operation site, the Applicability of the IAEA safety standards to TNPP, the Safety issues related to the siting, design and operation and Emergency planning – onsite and offsite
- The task force in the WNA/CORDEL on SMR and the interface with INPRO case study
- The interface with the SMR Forum

➔ **NUSSC requests to be informed of the conclusions of this project regarding the contents of Safety Standards.**  
➔ **Depending on these conclusions, NUSSC input may be required.**

### 6.5 Information on the Revision of SARIS question-sets

SARIS (self-assessment of regulatory infrastructure for safety) are a computer-based tool and methodology which allows Member States to self-assess their regulatory infrastructure for safety against the IAEA safety standards. It is a prerequisite for any IRRS mission. This tool is based on a questionnaire with:
- Primary questions: Boolean question (yes or no answers)  
- Subsidiary questions: to justify the answers to the primary questions

Former SARIS question-set ensured full consistency and consideration of the IAEA safety requirements with one primary question per each overarching requirement and the intention to cover the entire content through the subsidiary questions. However this approach led to many questions, at primary and secondary levels and redundancy between questionnaires. It was resource intensive for answering and analysis the questions.  
Thus the Agency re-organized and reviewed the question-set to enhance their design and to facilitate the conduct of self-assessment.

Now the new tool covers all aspects of the relevant IAEA Safety Requirements, ensures consistency with newly developed or revised IAEA safety standards and introduced a drastic reduction of questions. Indeed, overarching requirements were grouped when possible under a primary-question and expectations are provided for each primary question to facilitate an adequate response. All duplications and overlaps were tracked and deleted.

This new version will be released by the end of 2016.

➔ **NUSSC recognises the efforts accomplished by the IAEA to improve the SARIS questionnaire by taking into account Member State and IAEA staff feedback. The release of this new questionnaire will allow an analysis of its effectiveness.**

### 6.6 Presentation by the International Electronical Commission (IEC)

The IEC is a non-governmental organisation gathering 83 countries. It has published 7000 standards thanks to 20 000 experts working into 1500 different working groups.  
The IEC is organized in two sub-commissions:
- 45A on instrumentation, control and electrical systems of nuclear facilities; and  
- 45B on radiation monitoring instrumentation

The sub-commissions 45A is composed of more than 200 experts from the 22 major nuclear supporting countries, working within 8 active Working Groups and maintaining a standard portfolio of 65 standards.
To develop a standards an average of 32 months is necessary. The IEC collaborates with the IAEA in the safety fields but also, more recently, in the security one with the MDEP program. It strives at publishing standards reproducing the IAEA safety requirements.

→ The NUSSC President invites members and observers to volunteer to give presentations on safety standards use and national needs on the matter.

Germany, Belgium and Netherlands volunteered for the next meeting or the one after next.

7. CLOSURE OF THE MEETING

7.1 List of Actions for the 41st NUSSC Meeting

The List of Actions for the 41st NUSSC Meeting was introduced by Mr. Svab to the audience. The NUSSC Members did not comment on the list and approved it. The list was attached to this report as an annex (Annex II).

7.2 Conclusions

All the agenda items were addressed. The actions decided at the 41th NUSSC Meeting are intended to be posted on the website of the IAEA. The dates of the next NUSSC Meetings will be:

- 42nd NUSSC Meeting: 28 November 2016 – 2 December 2016, during this week the EPreSC and WASSC Meetings will also be held.
- 43rd NUSSC Meeting: 19-23 June 2017.
- 44th NUSSC Meeting: 27 November 2017 – 1 December 2017.
ANNEX I

AGENDA

41st Meeting of the Nuclear Safety Standards Committee (NUSSC)
21 – 23 June 2016, Vienna
VIC, M Building, Meeting Room M3

Tuesday, 21 June 2016, at 9:30 a.m. – Thursday, 23 June 2016, till 4:00 p.m.

1. GENERAL ISSUES

1.1 Opening of the Meeting
   - Opening remarks by DIR-NSNI

1.2 Chairman’s Introduction

1.3 Adoption of the Agenda of the 41st NUSSC Meeting
   For approval
   NUSSC Members

1.4 Approval of the Report of the 40th NUSSC Meeting
   For approval
   NUSSC Members

1.5 Actions of NUSSC Meetings
   For information
   Mr M. Svab

1.6 Dates of the next meetings:
   For approval
   NUSSC Members
   - 42nd NUSSC Meeting: 28 November – 2 December 2016
   - 43rd NUSSC: 19 – 23 June 2017 (TBD)
   - 44th NUSSC: 27 November – 1 December 2017 (TBD)

1.7 Report from the previous meeting of the Chairs
   For information
   Mr F. Feron

1.8 CSS 39th Meeting Report
   For information
   Mr D. Delattre

1.9 Status of the NSS-Online User Interface IT platform
   For information
   Mr D. Delattre

2. REVIEW OF IAEA SAFETY STANDARDS

2.1 DS495 Specific Safety Requirements: Regulations for the Safe Transport of Radioactive Material, No.SSR-6, 20xx Edition
   For approval for submission to MS
   Mr S. Whittingham
   (also for EPReSC, RASSC, WASSC, TRANSSC)

2.2 DS474 Draft Safety Guide: Arrangements for the Termination of a Nuclear or Radiological Emergency
   For approval for submission to MS
   Ms S. Nestoroska-Madjunarova
2.3 **DS482 Draft Safety Guide: Design of Reactor Containment Systems for Nuclear Power Plants**  
*For approval for submission to MS*

(Also for EPReSC, RASSC, WASSC, TRANSSC)

2.4 **DS488 Draft Safety Guide: Design of the Reactor Core for Nuclear Power Plants**  
*For approval for submission to MS*

2.5 **DS491 Draft Safety Guide: Deterministic Safety Analysis for Nuclear Power Plants**  
*For approval for submission to MS*

(Also for RASSC, WASSC, EPReSC)

2.6 **Status of Safety Standards**  
*For information*

3. **REVIEW OF DOCUMENT PREPARATION PROFILES (DPPs) – Safety Standards**

3.1 **DPP DS497 Revision of eight closely interrelated Safety Guides: NS-G-2.2 to 2.8 and NS-G-2.14**  
*For approval for submission to CSS*

(Also for RASSC, TRANSSC, WASSC, NSGC, EPReSC)

4. **SAFETY STANDARDS FOR INFORMATION**

4.1 **DS427 Draft Safety Guide: Prospective Radiological Environmental Impact Assessment for Facilities and Activities**  
*For information*

4.2 **DS432 Draft Safety Guide: Radiation Protection of the Public and the Environment**  
*For information*

4.3 **DS442 Draft Safety Guide: Regulatory Control of Radioactive Discharges to the Environment**  
*For information*

5. **NSGC DOCUMENTS FOR CLEARANCE**

5.1 **NST009 Draft Implementing Guide: Building Capacity for Nuclear Security**  
*For clearance to submit to DDG*

(Also for RASSC, TRANSSC, WASSC, and NSGC)

5.2 **NST041 Draft Implementing Guide: Preventive and Protective Measures against Insider Threats**  
*For clearance to submit to DDG*

(Also for RASSC, TRANSSC, WASSC, EPReSC and NSGC)
5.3 NST058 DPP Implementing Guide: Development, Use and Maintenance of Threat Assessment and Design Basis Threat
(also for RASSC, TRANSSC, WASSC, EPreSC and NSGC)

For clearance for the development Mr. S. Parulkar

6. MISCELLANEOUS

6.1 Information on the TECDOC on Development and Application of a Framework of Safety Goals for Nuclear Installations
For information Mr. J. Yllera

6.2 Information on the TECDOC Considerations in the Application of the IAEA Safety Requirements for Design of NPPs
For information Mr. J. Yllera

6.3 Defence in Depth level definitions – options to progress
For discussion Mr. F. Feron

6.4 Overview of INPRO CP "Case Study for the Deployment of a Factory Fuelled SMR"
For information Mr. J.R. Phillips

6.5 Information on the revision of SARIS Question-Sets
For information Mr. J.-R. Jubin

6.6 Feedback on Regulatory Arrangements and Current Developments in NUSSC Member States (IEC)
For information Mr. J.-P. Bouard

7. CLOSURE OF THE MEETING

7.1 Actions following the 41st NUSSC Meeting
For discussion Mr. M. Svab/NUSSC Members

7.2 Conclusions
Mr. G. Rzentkowski/Mr F. Feron

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date</th>
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<tr>
<td>40th CSS Meeting</td>
<td>7 – 11 November 2016</td>
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<td>2nd EPreSC Meeting</td>
<td>27 June – 1 July 2016</td>
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<td>3rd EPreSC Meeting</td>
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<td>42nd NUSSC Meeting</td>
<td>28 November – 2 December 2016</td>
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<td>41st RASSC Meeting</td>
<td>21 – 25 November 2016</td>
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<td>42nd WASSC Meeting</td>
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<td>10th NSGC Meeting</td>
<td>14 – 18 November 2016</td>
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<td>33rd TRANSSC Meeting</td>
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## ANNEX II

### Actions following the 41st NUSSC Meeting

<table>
<thead>
<tr>
<th>Item</th>
<th>Action</th>
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<th>When</th>
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<tr>
<td>2.1</td>
<td>DS495 Specific Safety Requirements: Regulations for the Safe Transport of Radioactive Material, No. SSR-6, 20xx Edition Approved for submission to Member States</td>
<td>Secretariat</td>
<td>ASAP</td>
</tr>
<tr>
<td>2.2</td>
<td>DS474 Draft Safety Guide: Arrangements for the Termination of a Nuclear or Radiological Emergency Approved for submission to Member States</td>
<td>Secretariat</td>
<td>ASAP</td>
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</tbody>
</table>
| 2.3  | DS482 Draft Safety Guide: Design of Reactor Containment Systems for Nuclear Power Plants Approved for the submission to Member States, provided that the following modifications are implemented:  
- Need to highlight the major consequences on containment design of the choice of cooling strategy of corium (in-vessel and ex-vessel);  
- Regarding Appendix 1, it will be included in DS482 for the consultation of Member States. | Secretariat | ASAP |
| 2.4  | DS488 Draft Safety Guide: Design of the Reactor Core for Nuclear Power Plants Approved for submission to Member States, provided that the IAEA ensures that the reasons for the recommendations are presented under footnotes or in an annex, if they exceed a few lines, so that the document is more “user friendly”. | Secretariat | ASAP |
| 2.5  | DS491 Draft Safety Guide: Deterministic Safety Analysis for Nuclear Power Plants Approved for submission to Member States after the rewording of paragraphs 7.51 and 7.64. | Secretariat | ASAP |
| 3.1  | DPP DS497 Revision of eight closely interrelated Safety Guides: NS-G-2.2 to 2.8 and NS-G-2.14 Approved for submission for CSS, provided that an annex is added in order to pinpoint the parts of the guides to be updated. (other parts may later be updated for internal consistency of guide) | Secretariat | ASAP |
| 5.1  | NST009 Draft Implementing Guide: Building Capacity for Nuclear Security Cleared for submission to DDG | Secretariat | ASAP |
| 5.2  | NST041 Draft Implementing Guide: Preventive and Protective Measures against Insider Threats Cleared for submission to DDG | Secretariat | ASAP |
| 5.3  | NST058 DPP Implementing Guide: Development, Use and Maintenance of Threat Assessment and Design Basic Threat Cleared for development | Secretariat | ASAP |
| 6.6  | NUSSC Members and Observers are encouraged to consider to make voluntary presentations at the 42nd NUSSC Meeting | Secretariat | By 15 September to inform IAEA |
## Annex III

### List of Participants

<table>
<thead>
<tr>
<th>Country/Int.Organization</th>
<th>Last Name</th>
<th>First Name</th>
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