R1 OPENING OF THE MEETING

R1.1 Introduction and Welcome

The meeting was formally opened by Mr. Juan Carlos Lentijo, Deputy Director General of the Department of Nuclear Safety and Security. Mr. Lentijo welcomed all members, experts and observer organizations to the meeting. He thanked Ms. Ritva Bly from Finland for agreeing to chair RASSC for the upcoming term, noting that four of the seven Chairpersons of the Committees are now women.

Mr. Lentijo informed RASSC about two important upcoming meetings. From 23 to 27 September 2019, the ninth International NORM Symposium will be organized by the Conference of Radiation Protection Control Directors (CRCPD) in Denver (Colorado), in cooperation with the IAEA. The Agency will host the International Conference on Radiation Safety: Addressing Challenges in Application in Vienna from 9-13 November 2020. This latter event is being organized in cooperation with the other seven international organizations who cosponsor of the International Basic Safety Standards (GSR Part 3).

Moving on to the work programme for the new term, Mr. Lentijo highlighted the projects Radionuclides in Food and Drinking Water in Non-Emergency Situations and the revision of the safety guide Application of the Concepts of Exclusion, Exemption and Clearance (RS-G-1.7). He noted that both items are of interest to most Member States and he encouraged RASSC to prioritize both projects during the current term.

Mr. Lentijo underlined the importance of radiation protection in underpinning many of the Agency’s activities and thanked RASSC for its ongoing advice and support of the Agency’s work.

R1.2 Chairperson’s Comments

The Chairperson, Ms. Ritva Bly, thanked Mr. Lentijo for his warm welcome. She felt very honoured to be invited to act as Chairperson of RASSC and to have the opportunity to contribute to the work of the Agency. She also welcomed all participants, noting that there are many new members for the upcoming term; she encouraged them to bring forward new ideas and to participate actively in discussions.

Ms. Bly informed the meeting that regrets were received from Albania, Cambodia, Hungary, Lithuania, New Zealand, Pakistan, Romania and the Pan American Health Organization (PAHO). Alternate observers were attending the meeting on behalf of the International Radiation Protection Association (IRPA) and the Nuclear Energy Agency (NEA).

R1.3 Adoption of the Agenda

There were no proposed additions or changes to the Agenda, which was therefore approved.

Belgium noted that there was no Topical Session for this meeting and expressed the view that these had proved to be of great interest in the past. Ms. Bly commented that there was a heavy agenda for this meeting but that it was the intention to include Topical Sessions in future meetings. She encouraged proposals for the issues to be covered by such Sessions.

R1.4 Administrative Arrangements

The Scientific Secretary, Mr. Tony Colgan, drew attention to the location of the emergency exits, introduced the administrative support staff for the meeting and summarized the administrative
arrangements. He reminded the Committee that smoking was forbidden in all areas of the VIC, including in the plaza.

**R1.5 Chairperson’s Report of RASSC 43**

Comments on the draft Chairperson’s Report of RASSC 43 were received from Japan and IRPA. A revised draft was posted on the RASSC website on 26 April 2018. There were no comments from the floor and the Chairperson’s Report for RASSC 43 was therefore approved.

**R1.6 Actions Arising from RASSC 43**

Mr. Colgan informed RASSC of the status of actions from RASSC 43. The draft safety guides *Radiation Safety of X-Ray Generators and Other Radiation Sources Used for Inspection Purposes and for Non-Medical Human Imaging* (DS471), *Format and Content of the Safety Analysis Report for Nuclear Power Plants* (DS449) and *Deterministic Safety Analysis for Nuclear Power Plants* (DS491) which were approved by all Committees will be submitted to the next meeting of the CSS in November 2018 for endorsement.

The draft safety guide *Management System for the Predisposal and Disposal of Radioactive Waste* (DS477) was approved for submission to Member States for comment. However, this has been put on hold pending discussions on the DPP for a general safety guide *Leadership, Management and Culture for Safety* (DS513) which will be discussed under item R5.1 at this meeting.

Three DPPs, all dealing with the revision and merging of existing safety guides on research reactors were endorsed by the CSS at its meeting in April 2018. Three nuclear security documents that were cleared will be progressed and will return to RASSC for comment in due course.

At the previous meeting there was extensive discussion on the RASSC end-of-term report. The Secretariat prepared a questionnaire to rank the priority items for the forthcoming term and circulated it to all RASSC members and observers on 24 November 2017. The results were circulated on the RASSC website on 8 January 2018. There were no additional comments and the end-of-term report was updated to include this ranking; this was circulated on 23 January 2018 with a deadline of 9 February 2018 for comment. No comments were received and the end-of-term report was submitted to the Deputy Director General later in February 2018.

The final matter from the previous meeting was to make the draft text of the safety report *Radiation Protection in Veterinary Medicine* available for comment in advance of the next meeting. This was posted on the RASSC website on 30 April 2018 and is included as item R6.3 of the agenda for this meeting.

Ms. Bly commented that the priorities for the new term will be discussed under item R7.2 of the agenda.

**R2 GENERAL SAFETY STANDARDS ISSUES**

**R2.1 Procedures for the Development and Approval of Safety Standards**

Ms. Katherine Asfaw provided an overview of the 14-step procedure for the development and approval of safety standards, focusing in particular on the steps that involve the Committees. These procedures are laid out in the document *Strategies and Processes for the Establishment of IAEA Safety Standards – part B* (SPESS B) and are applicable to both the Safety Standards and the Nuclear Security Series documents. The most recent edition was published in March 2018.

The procedures cover the four main components of the development and approval process: planning (steps 1-4), drafting (steps 5-8), refining (steps 9-11) and finishing (steps 12-14). The inputs from the
Committees are expected at step 3 (approval of the DPP), step 7 (first review of the draft prior to approval for submission to Member States for comment) and step 11 (second review of the draft following incorporation of Member States’ comments). International Organizations are expected to provide their comments at the stage of approval of the DPP (steps 1-3) and prior to submitting the draft document to Member States for comment (step 7).

At step 3, the draft DPP should be available for review at least eight weeks prior to the meeting of the first Committee that will review the document – this may not be the lead Committee. Committee members should post their comments online at least three weeks prior to this first meeting and the Technical Officer will post the resolution table of comments received one week before the first meeting. Ms. Asfaw advised that issues not addressed at this stage are more difficult to resolve at a later time.

At step 7, the purpose is to verify consistency of the draft with the DPP and to consider whether the text is adequate to be sent to Member States for comment. Issues to be considered include technical accuracy, comprehensiveness and the level of detail. This is usually the last opportunity to make major changes to the document and is also the step at which observer organizations are expected to provide their comments.

At step 11, Member States comments have been incorporated and the draft has undergone technical review. This therefore represents a final text that is to be considered for submission to the CSS for endorsement. The purpose of the review by the Committees is to verify that Member State comments have been adequately addressed, to make sure there is consensus and to provide a final check on quality. At this stage it is not possible to introduce new issues or to refocus the document. Ms. Asfaw commented that SPESS B does not require the final draft to be uploaded in advance of meetings, but in practice that is often done.

Following conclusion of step 11, the in-house Publications Committee ensures that the text adheres to the principles of the one-house policy and editors provide an independent set of eyes to catch errors and to polish the text. Following submission to the CSS, conceptual changes are avoided although sometimes technical comments are received and need to be resolved. The Chairperson of the lead Committee is kept informed and is authorized to agree to minor changes that do not alter the technical content of the document. Safety Guides are published about three months after the CSS meeting; Safety Requirements need to go through the additional step of approval by the IAEA Board of Governors.

Ms. Asfaw commented that all Safety Standards are available on the IAEA website, including those that have been superseded as far back as 1958.

In response to a question from Israel, Ms. Asfaw noted that the Co-ordination Committee is an in-house Committee that reviews and approves all DPPs and draft documents before they are submitted to the Committees. On the other hand, the Interface Committee consists of the Chairpersons of the five Safety Standards Committees and representatives of the Nuclear Security Guidance Committee who review all DPPs and decide on whether or not there is an interface between safety and security that needs to be addressed in the document.

The ISO commented on the importance of ensuring that the IAEA Safety Standards are consistent with the standards developed by other International Organizations.

**R2.2 The NSS-OUI Platform**
Mr. Dominique Delattre presented the new content and knowledge management IT platform “NSS-OUI” (Nuclear Safety and Security Online User Interface). The system allows the management of relationships between requirements or recommendations and guidance particularly in a top-down approach, as well as horizontal relationships between requirements/recommendations or between guidance. In addition, it has advanced search and navigation capabilities. This allows the possibility of revising safety standards by topical area rather than on a document-by-document basis.

All of the Safety Standards and Nuclear Security Series publications have been uploaded onto the NSS-OUI platform, which has both an online search function and the possibility to provide feedback. The online search capability is publicly available and can be used without restriction to identify, for example, all of the text related to a specific topic throughout the suite of Safety Standards or Nuclear Security Series publications. To provide feedback on existing safety standards, members of the Safety Standards Committees, the Nuclear Security Guidance Committee and the CSS and officially nominated observers need to register in NUCLEUS and provide this information to the Secretariat so that they can be provided access to the feedback function. Mr. Delattre demonstrated how this can be done through the IAEA website by accessing.

The Chairperson asked for volunteers who have used NSS-OUI to report at future meetings on their user experience.

Action: The Secretariat to contact all RASSC members and observers requesting their NUCLEUS user name, user ID and e-mail address so that they can be registered to provide feedback.

R2.3 Using the Committees’ Website

Ms. Asfaw informed RASSC that all material related to the IAEA Safety Standards and the work of the Safety Standards Committees is presently being migrated to a new website. Once in use, this will not involve major changes to the working of the Committees. Ms. Asfaw confirmed that a detailed presentation on the new website will be made at a future RASSC meeting, prior to the new website going live.

R2.4 Report of the 43rd Meeting of the Commission on Safety Standards

Mr. Delattre informed RASSC that 13 of the 14 Safety Requirements have been published; the remaining Safety Requirements on Site Evaluation for Nuclear Installations (SSR 1) is on the agenda for this meeting at Step 11, i.e. seeking approval for submission to the CSS for endorsement. Currently there are 133 Safety Standards published with a further 56 under development, most of which are revisions of existing standards.

Over the past 18 months, changes to the editorial procedures have speeded up the publications procedure so that, following endorsement by the CSS, safety standards are normally published within three months. Mr. Delattre noted that three Safety Standards have been published since the last meeting and he listed the 13 safety guides that are awaiting publication following endorsement by the CSS. The RASSC-led safety guides Radiation Protection and Safety in Medical Uses of Ionizing Radiation (DS399) and Occupational Radiation Protection (DS453) are both expected to be published shortly.

WHO welcomed the information in relation to the imminent publication of DS399, noting that it will greatly assist Member States with implementation in the medical exposures area.

The policy discussions at the CSS in relation to the UNSCEAR Report Attributing Health Effects to Ionizing Radiation Exposure and Inferring Risks are discussed under agenda item R3.1.

---

1 Australia subsequently volunteered to make a presentation at the next RASSC meeting.
R2.5 Holistic Review of the Set of Safety Guides

Mr. Delattre informed RASSC that a file containing all safety guides published and under development is available on the CSS website. All Safety Standards Committees are invited to review the current set of safety guides to identify any gaps or overlaps that might exist and to offer advice on how these should be addressed.

The Chairperson indicated that this could be considered in more detail under agenda item R7.1 (Status of RASSC-led Safety Standards and Supporting Documents).

R3 UNSCEAR REPORT: ATTRIBUTING HEALTH EFFECTS TO IONIZING RADIATION EXPOSURE AND INFERRING RISKS

R3.1 Opinion of the Commission on Safety Standards

R3.2 Review of Safety Standards in light of the UNSCEAR Report: Request from the CSS

Mr. Colgan provided an overview of the process and timeline for developing the RASSC Opinion on the UNSCEAR Report Attributing Health Effects to Ionizing Radiation Exposure and Inferring Risks (hereafter referred to as the UNSCEAR Report). This Opinion was requested by the CSS at its meeting in April 2014 and was developed though the establishment of an Electronic Working Group of RASSC members and observers. The final text was approved by RASSC prior to its submission to the CSS.

Mr. Delattre reported on the discussions on the UNSCEAR Report at the most recent CSS meeting in April 2018, including the outcome of a Consultants’ Meeting held in February 2018 to consider the implications of the UNSCEAR Report for the IAEA Safety Standards. Mr. Delattre informed RASSC that the CSS endorsed the report of the Consultants’ Meeting and its recommendations (a copy of the report is available on the RASSC website).

Based on discussions, the CSS has identified three items to be addressed by all Safety Standards Committees, namely

1. The CSS requests the Safety Standards Committees determine which safety standards currently under development or already published could be strengthened with regard to those issues covered by the UNSCEAR Report, and for the SSC Chairs to report on progress to the CSS meetings in 2018.

2. The CSS recommends that a Safety Report be prepared — by experts from each of the five Safety Standards Committees and with the involvement of the Nuclear Security Guidance Committee and the Secretaries of ICRP and UNSCEAR — to provide practical guidance, including case studies, on how to apply the following concepts:
   - Retrospective attribution of radiation health effects;
   - Prospective inference of health risks from radiation exposures;
   - Prediction of notional health effects for comparative purposes (e.g. the use of collective dose).

The Committees should identify experts at the June/July SSC and NSGC meetings to participate in the drafting of the Safety Report starting in the 4th Quarter of 2018.

3. The CSS recommends that the Safety Standards Committees undertake a review of SF-1 at the June/July 2018 meetings and report back at the 44th CSS meeting in November 2018.

Mr. Delattre stressed that the CSS considered that the UNSCEAR Report, in itself, is not a sufficient basis for initiating a revision of the Safety Fundamentals (SF-1). Consequently, the request from the CSS is only to review SF-1 and no decision has been made on the need to revise SF-1. Mr. Delattre also commented that SF-1 was published in 2006 and therefore predates the new ICRP Recommendations...
ICRP 103) published in 2007. SF-1 is therefore not consistent with ICRP 103 and is also considered to be unbalanced in that greater emphasis is placed on planned exposure situations.

The Chairperson noted that the UNSCEAR Report has now been linked to a review of SF-1 and that both items should be considered together. She therefore opened the floor to discussion on all items referred to RASSC by the CSS.

In response to a question by WHO, Mr. Delattre confirmed that in the event of a decision to revise SF-1, the cosponsoring International Organizations would be consulted at the start and throughout the revision process. He added that the International Organizations with observer status at RASSC can contribute to the review process. The WHO underlined that many of the Safety Requirements are jointly sponsored by several International Organizations; should they not be in a position to sponsor any revised SF-1, their sponsorship of supporting documents such as Safety Requirements and Safety Guides could potentially be called into question.

France commented that the ICRP draft publication The Use of Effective Dose as a Radiological Protection Quantity should be considered in the review process. Mr. Delattre noted the decision of the Board of Governors to follow the recommendations of ICRP ‘to the extent possible’ and added that retrospective attribution of health effects is not covered by ICRP.

Several questions were raised as to why, in light of the RASSC Opinion that the UNSCEAR Report has no direct and immediate implications for the IAEA Safety standards, work is continuing on this issue. Mr. Delattre commented that the CSS accepted the view of RASSC but identified the need to provide additional information on how the Safety Standards should be used and to prevent their misuse. Issues on which clarification is required include the circumstances in which collective should and should not be used and that the Safety Standards should be used only prospectively.

The United States underlined the importance of narrowly defining the scope of the Safety Report to be developed and of the review of SF-1. The United States also asked for clear processes for both these items of work to be agreed in advance. Mr. Pinak noted that the expertise on these items lies primarily with RASSC and that it is important that RASSC both has an opinion and participates actively in the work.

RASSC confirmed its opinion, agreed following the RASSC 39 meeting in November 2015 and subsequently submitted to the CSS in January 2016, that the UNSCEAR Report has no direct and immediate impact on the IAEA Safety Standards. RASSC also confirmed its opinion that the UNSCEAR Report raises questions about communication with the public on issues such as exposure, health effects and future risks that need to be addressed.

RASSC established a Working Group to undertake a preliminary review of SF-1. The Working Group met on two occasions during the RASSC meeting and reported on its discussions to the plenary session. The Working Group identified the following key points to be considered in reviewing SF-1:

1. ICRP 103 does not change the basic principles of radiation protection. Rather, the ICRP recommendations have evolved from the previous approach using practices and interventions to an approach based on exposure situations. ICRP 103 primarily changes only how individual recommendations are structured and presented.

2. While SF-1 may not be fully consistent with the terminology and approach used in ICRP 103, the ICRP 103 recommendations are already fully reflected in GSR Part 3 and GSR Part 7. Those

---

2 The Working Group consisted of RASSC members, observers and experts from Argentina, Australia, Belgium, Czech Republic, Finland, France, India, Indonesia, Israel (chair), Singapore, Sweden, Switzerland, United Arab Emirates, United Kingdom, United States and the European Nuclear Installations Safety Standards Initiative.
safety guides that have been developed based on GSR Part 3 are also fully consistent with
ICRP 103.
(3) If SF-1 is to be revised, the involvement of co-sponsoring International Organizations is
important. International Organizations currently co-sponsor many of the Safety Requirements
documents. It is important that they also co-sponsor any revised Safety Fundamentals so that
their co-sponsorship of the Safety Requirements can be maintained.
(4) The subject covered by the UNSCEAR Report is not new, but it is accepted that it is not well
understood. While it is agreed that this is an issue that, on its own, is not a sufficient basis for
revising SF-1, the extent to which the issues raised in the UNSCEAR Report need to be
addressed in SF-1 requires further discussion.
(5) It is important that SF-1 fully reflects both the normal situation and exceptional circumstances
that can sometimes arise. For example, one can accept higher doses in medicine and after an
emergency if such doses are justified. Thus, the three fundamental principles of justification,
optimization and dose limitation must all be reflected in a balanced way throughout SF-1.
(6) SF-1 should clarify that the Linear No Threshold (LNT) model is used for radiation protection
purposes (prospective inference of risk) and it should not be misused for retrospective
attribution of health effects.
RASSC took the following positions with regard to the three items referred to it by the CSS:
RASSC agreed that all safety standards presented to it from now on for review or approval will be
scrutinized to determine which could be strengthened in relation to the issues raised in the UNSCEAR
Report. Safety standards already published will in due course be reviewed and therefore will be
subject to the same scrutiny at that time.
RASSC welcomed the decision to develop a Safety Report to better explain the issues raised in the
UNSCEAR Report. RASSC also supports the limited scope of such a Safety Report as proposed by the
CSS. RASSC considers that the Safety Report will represent an important input into a decision on
whether or not the Safety Fundamentals (SF-1) should be revised. Given that the issues to be
addressed fall primarily within the remit of RASSC, RASSC considers that it would be appropriate for
one of its nominees to act as Chairperson of the drafting group.
RASSC established an Electronic Working Group (EWG) to undertake a more detailed review of SF-1.
The conclusions and recommendations from the EWG will be presented to and discussed at the next
RASSC meeting in November 2018.
It was agreed that the nominations for participation in both the RASSC EWG and the CSS Working
Group should be received on or before 30 June 2018.
Action: The Secretariat to invite nominations from RASSC members to join the Electronic Working
Group to review the IAEA Safety Fundamentals.
Action: The Secretariat to invite RASSC members to nominate experts to join the CSS Working Group
to develop a safety report on issues raised by the UNSCEAR Report.
R4 SAFETY STANDARDS FOR APPROVAL
R4.1 Draft Safety Guide: Radiation Safety of Accelerator Radioisotope Production Facilities
(DS434)
Mr. Haridasan Pappinisseri presented the draft safety guide Radiation Safety of Accelerator
Radioisotope Production Facilities (DS434). The document provides recommendations on how to meet
the requirements of GSR Part 3 with regard to radioisotope production facilities, including practical
recommendations on the safe design and operation of these facilities for use by operating
organizations and designers, and by regulatory bodies. In order to avoid duplication with other safety
guides, the scope is limited to accelerator-based facilities (cyclotrons and linear accelerators) and
excludes reactor-based production facilities.

A total of 236 comments were received from Member States, of which 204 were accepted and 32
were rejected. Most comments were editorial in nature. Many of the rejected comments had
proposed changes that were inconsistent with other safety guides or with the IAEA glossary.

Following resolution of Member States’ comments and posting of the revised text on the Committees’
website, a further 49 comments were received. Of these, 37 were accepted and 12 were rejected.
Comments from France and Germany to designate the accelerator room as a controlled area were
accepted while comments from Turkey relating to EPR were already covered in other Agency
documents and therefore were not accepted.

Mr. Pappinisseri asked RASSC to decide on a request to amend paragraph 5.38 as follows:

During the process of site selection, particular consideration should be given to potential hazards that
cannot be addressed by means of engineering measures, such as hazards relating to geological
phenomena in areas of potential or actual subsidence, uplift, collapse, faulting or volcanic activity.

For consistency with other similar safety guides, Israel proposed that the title be changed to Radiation
Protection and Safety of Accelerator Radioisotope Production Facilities. This was agreed. It was also
agreed to add additional text proposed by the United States in relation to dosimetry for the lens of
the eye.

RASSC considered that it was difficult to approve the document without seeing the amended text
incorporating the comments from the Committees. It was agreed that, following review and comment
by all Committees, the Secretariat would make the final text available for online review and approval
by the end of July 2018 with a deadline for submission of comments of mid-September 2018. It was
further agreed that failure to comment would indicate agreement to the text. The Chairperson was
authorized to resolve any issues that were more than editorial in nature through consultation with the
Technical Officer and the Chairpersons of the other Committees. RASSC noted that this process would
not delay submission of the draft safety guide to the CSS for endorsement.

Action: The Secretariat to make the final text of the draft safety guide Radiation Safety of
Accelerator Radioisotope Production Facilities (DS434) available for online review and approval by
the end of July 2018 with a deadline for submission of comments by mid-September 2018.

R4.2 Draft Safety Requirements: Site Evaluation for Nuclear Installations (revision of NS-R-3)
(DS484)

Mr. Ovidou Coman introduced the draft safety requirements Site Evaluation for Nuclear Installations
(SSR-1). This is a revision of NS-R-3 first published in 2003. An updated version (NS-R-3 rev. 1) was
published in 2016 to address issues highlighted by the Fukushima Daiichi NPP accident. The current
revision builds on the 2016 edition and incorporates developments since 2003 related to site
evaluation for nuclear installations. In terms of style and content, the text is fully consistent with
recently published IAEA Safety Standards.

The main objective of the document is to establish appropriate requirements and criteria for
addressing the evaluation of those site-related factors that have to be taken into account to ensure
that the site–installation interactions do not constitute an unacceptable risk to individuals, the public
or the environment. It covers site evaluation for a broad range of new and existing nuclear installations
as defined in the IAEA Safety Glossary and is intended for use by regulatory bodies in establishing regulatory requirements, and by operating organizations or their contractors in conducting site evaluation for nuclear installations.

The text was developed through three Consultants’ Meetings held between 2013 and 2015. The document consists of 29 requirements and new requirements have been developed in relation to safety principles and concepts, data requirements and the identification and screening of site-specific external hazards. The management system for site evaluation has been updated, the interface between nuclear safety and nuclear security is defined and the scope of the site evaluation is based on the application of the graded approach.

A total of 317 comments were received from 13 Member States and one International Organization. Of these, 215 were accepted and 100 were rejected. All comments were fully addressed. Following posting on the Committees’ website, a further 59 comments were received, of which 41 were accepted and 18 were rejected. Most of these were of an editorial nature and no new issues were raised.

RASSC had no questions or comments and the draft safety requirements Site Evaluation for Nuclear Installations (DS484) was approved for submission to the CSS for endorsement.

**Action:** The Secretariat to submit the draft safety requirements Site Evaluation for Nuclear Installations (DS484) to the CSS for endorsement.

**R4.3 Draft Safety Guide: Radiation Protection and Safety in Well Logging (DS419)**

Mr. Haridasan Pappinisseri introduced the draft safety guide Radiation Protection and Safety in Well Logging (DS419). The document provides guidance on how to meet the requirements of GSR Part 3 regarding the use of radiation sources and radiation generators in well logging. It covers radiation safety issues associated with well logging and provides information on the need for appropriate nuclear security measures. NORM in the well-logging industry is outside the scope of the document.

The document was previously discussed by RASSC at its meeting in November 2015, at which time a number of additional amendments were requested. Specifically, Australia and the United States proposed changes to the text dealing with regulatory control of well-logging sources. The technical editing of both DS419 and DS420 (see agenda item R4.4 below) was carried out in parallel; this identified some inconsistencies in both documents with other similar safety guides, but these have now been addressed.

The review by the Committees generated 77 comments, of which 56 were accepted and 21 were rejected. Many of these were editorial in nature. Mr. Pappinisseri noted that requests to merge DS419 dealing with well-logging sources and DS420 dealing with nuclear gauges were not accepted. RASSC had previously decided that the audiences for both documents is different and, while some of the text might need to be duplicated, both issues should be covered in separate documents.

Mr. Pappinisseri asked RASSC for its opinion on a requested change to para. 7.7 regarding the frequency of testing and calibration of workplace monitoring instruments; the proposed change was to delete the words ‘at least annually’ as indicated below.

The operating organization should arrange for workplace monitoring instruments to be formally tested or calibrated at periodic intervals (at least annually) by an authorized testing laboratory.

On this point, Brazil noted the difference between routine testing to ensure correct operation and the more formal process of calibration. The frequency of calibration should be defined by the regulatory body while testing is often carried out daily or weekly. Brazil added that the expression ‘formally tested’ was problematic as it is not clear where this should be carried out, or by whom. Australia added
that the frequency and calibration could be different for dose rate monitors and contamination meters. United Arab Emirates considered that the manufacturer’s recommendations on the frequency of testing and calibration should be followed. Both the US and the United Kingdom were concerned that the text was too specific and supported an approach that allowed flexibility.

ISSPA commented that recommendations regarding the frequency of calibration are normally made by the manufacturer; the recommended frequency can be between one and three years and after any damage or malfunction. France referred to the safety guide *Occupational Radiation Protection* (DS453), which contains extensive guidance on the calibration and testing of monitoring instruments.

Mr. Delattre checked NSS-OUI and confirmed that there was also text on this issue in the safety guide *Radiation Safety in Industrial Radiography* (SSG-11).

After extensive discussion, RASSC agreed to delete the term ‘at least annually’ from para. 7.7.

RASSC noted that the amended text incorporating the comments from the Committees was not posted on the website and decided to follow the same approval procedure as for DS434. It was agreed that, following review and comment by all Committees, the Secretariat would make the final text available for online review and approval by the end of July 2018 with a deadline for submission of comments of mid-September 2018. It was further agreed that failure to comment would indicate agreement to the text. The Chairperson was authorized to resolve any issues that were more than editorial in nature through consultation with the Technical Officer and the Chairpersons of the other Committees. RASSC noted that this process would not delay submission of the draft safety guide to the CSS for endorsement.

**Action:** The Secretariat to make the final text of the draft safety guide *Radiation Protection and Safety in Well Logging* (DS419) available for online review and approval by the end of July 2018 with a deadline for submission of comments by mid-September 2018.

**R4.4 Draft Safety Guide: Radiation Protection and Safety in the Use of Nuclear Gauges (DS420)**

Mr. Haridasan Pappinisseri introduced the draft safety guide *Radiation Protection and Safety in the Use of Nuclear Gauges* (DS420), which was developed in parallel with DS419 (see agenda item R4.3 above). The purpose of the document is to provide recommendations on how to meet the requirements of GSR Part 3 with regard to the design, construction and use of fixed and portable nuclear gauges. As well as addressing radiation safety issues, the need for appropriate nuclear security measures is also covered. Mr. Pappinisseri noted that the comments made regarding previous review by RASSC and the editing issues relating to DS419 also apply to DS420.

The review by the Committees generated 87 comments, of which 64 were accepted and 23 were rejected. The same comment regarding calibration and testing on monitoring equipment was also made on this document. Mr. Pappiniseri referred to a requested change to para. 10.30 where the insertion of additional text (as highlighted below) was requested.

*Nuclear gauges should be subject to a routine preventive maintenance schedule. Persons carrying out the maintenance work should be made aware of the radiation hazards and should be appropriately trained and the person should be preferably from the manufacturer or supplier. When working close to a nuclear gauge, a radiation monitor should always be used to confirm that any shutters are fully closed and that the source is adequately shielded.*

A number of comments were made that, in some Member States, persons other than those from the manufacturer or supplier are authorized to carry out maintenance work and that the proposed change made the text inconsistent with some national approaches. Overall, RASSC did not support the change as requested and asked the technical editors to prepare an acceptable text that would be consistent with other safety standards.
India considered that there was too much focus on higher activity sources and that the text dealing with the application of the graded approach might be expanded and strengthened. The Chairperson commented that, given the range of radionuclides and source activities used in nuclear gauges, the graded approach is indeed a fundamental consideration to this document. Mr. Pappinissi agreed that the focus is on larger sources, both because these are the main concern and most of the lower activity sources are considered inherently safe. He also pointed to paras. 3.2 and 3.12 to 3.14 of the document which discuss application of the graded approach. Following further discussion and review of the text, India indicated that it could accept the text as written. RASSC also agreed that the text related to the graded approach was acceptable.

Israel referred to Annex 3 of the document where the first reference is to an anti-nuclear organization called ‘Climate Sceptics’ and proposed that a more appropriate reference be used. RASSC agreed that this change be made, or else the reference be removed. The associated text to which the reference refers should also be reviewed.

RASSC decided to follow the same approval procedure as for DS434 and DS419. It was agreed that, following review and comment by all Committees, the Secretariat would make the final text available for online review and approval by the end of July 2018 with a deadline for submission of comments of mid-September 2018. It was further agreed that failure to comment would indicate agreement to the text. The Chairperson was authorized to resolve any issues that were more than editorial in nature through consultation with the Technical Officer and the Chairpersons of the other Committees. RASSC noted that this process would not delay submission of the draft safety guide to the CSS for endorsement.

Action: The Secretariat to make the final text of the draft safety guide Radiation Protection and Safety in the Use of Nuclear Gauges (DS420) available for online review and approval by the end of July 2018 with a deadline for submission of comments by mid-September 2018.

Mr. Mark Breitinger introduced the draft safety guide Preparedness and Response for an Emergency during the Transport of Radioactive Material (DS469), which is a revision of the existing safety guide Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material (TS-G-1.2) published in 2002. The document was developed through six Consultants’ Meetings between 2016 and 2018 and one Technical Meeting in October 2017. The intention is to produce a user-friendly document that is easy to follow and implement.

The document focuses on the most probable emergencies, while acknowledging and allowing for more severe emergencies. More specific guidance on the roles and responsibilities of consignors and carriers has been added. The current draft reflects past experiences and lessons learned from previous emergencies. All work in developing the document were managed jointly by the Incident and Emergency Centre and the Transport Safety Unit.

During the review period by the Committees, comments were received from EPReSC and TRANSSC; no comments were received from RASSC.

Belgium commented that the more frequent events may not be significant from the point of view of safety but they may involve the radiation protection authorities in that they generate local concerns, such as in hospitals who may be asked to deal with injured individuals. Mr. Breitinger recognized this as an important point and confirmed that events of this nature are indeed covered by the safety guide.

RASSC had no further comments or questions and the draft safety guide Preparedness and Response for an Emergency during the Transport of Radioactive Material (DS469) was approved for submission to Member States for comment.
Action: The Secretariat to submit the draft safety guide Preparedness and Response for an Emergency during the Transport of Radioactive Material (DS469) to Member States for comment.

R4.6 Draft Safety Guide: Establishing the Safety Infrastructure for a Nuclear Power Programme (Rev. 1) (revision by amendment of SSG-16) (DS486)

Mr. Tim Kobetz presented the draft safety guide Establishing the Safety Infrastructure for a Nuclear Power Programme (DS486) which is a revision by amendment of SSG-16 published in 2011. DS486 was initiated in 2014 to address lessons learned from the accident at the Fukushima Daiichi NPP, to reflect insights from the recent revisions of the relevant IAEA Safety Requirements, to address lessons learned during the utilization of SSG-11 since its publication and to align the text with IAEA Nuclear Energy Series No. NG-G-3.1 (Rev. 2), Milestones in the Development of a National Infrastructure for Nuclear Power. There is no change in the structure or approach compared with the current document.

A total of 230 comments were received from 11 Member States and one NGO. Of these, 163 were accepted in full or with modification. During the period of review by the Committees, a further 32 comments were received, of which 17 were accepted and 15 were rejected. Comments both from Member States and from the Committees have resulted in the document being strengthened in relation to safety culture.

RASSC had no further questions or comments and the draft safety guide Establishing the Safety Infrastructure for a Nuclear Power Programme (DS486) was approved for submission to the CSS for endorsement.

Action: The Secretariat to submit the draft safety guide Establishing the Safety Infrastructure for a Nuclear Power Programme (DS486) to the CSS for endorsement.

R5 DPPs FOR APPROVAL

R5.1 Leadership, Management and Culture for Safety (revision and merging of GS-G-3.1 and GS-G-3.5) (DS513)

Ms. Helen Rycraft presented the DPP for a safety guide Leadership, Management and Culture for Safety. The proposed new document will revise and merge the material in the two existing safety guides Application of the Management System for Facilities and Activities (GS-G-3.1) and The Management System for Nuclear Installations (GS-G-3.5). It is intended to be a general safety guide supporting each of the 14 requirements in Leadership and Management for Safety (GSR Part 2).

While safety culture is covered, to some extent, in many existing specific safety guides, an internal review has found that there is no guidance on how leadership supports management and how leadership and management are dependent on organizational culture and the safety culture developed as part of that culture. There is also a lack of guidance on developing leadership for safety and on the fostering and development of safety culture. There is some guidance on the graded approach, but not with respect to small organizations.

The new safety guide will provide generic guidance on leadership, management and culture for safety, as well as the relationships between them. Assessment and improvement will also be covered. Some guidance material that was in the precursor to GSR Part 2 will also be included. The target audience is operating organizations for facilities and activities, regulatory bodies, TSOs and government organizations.

A total of 76 comments were received on the DPP from the Committees. Of these 54 were accepted and 22 were rejected. Many of the comments received related to the interface with existing safety guides and Ms. Rycraft confirmed that the development process for the new guide will ensure the inclusion of generic good practices in other guides. This will ensure consistency and prevent...
She added that, once the new safety guide is developed, there will be some overlap with existing documents but this will be eliminated as these are revised.

France noted the importance of addressing the interface between safety and security in the document and underlined the difficulty in covering a range of facilities, from large nuclear installations to small users, in the one document. France considered that text on leadership and culture needs to apply to all facilities and an integrated approach needs to be promoted. Ms. Rycraft commented that it may be too early for a global application of integrating safety and security in relation to management and safety culture, but acknowledged that there was certainly a need for better coordination on these issues at national level. On this general point of safety and security in relation to leadership, management and safety culture, France considered that it would be useful to have a discussion at the policy level; Mr. Pinak suggested that it be raised by France’s representative on the CSS.

France followed up in relation to the scope of the safety guide and stated it did not support the concept of dealing with the management system for all facilities and activities in one document. This, it considered, would result in a document with too much focus on the nuclear industry, which would therefore be of little relevance to small users. France favoured either two separate documents, or at least an extensive annex dealing with small users in a general safety guide. Ms. Rycraft replied that it would certainly be possible to develop an annex for small users as proposed by France, but that development of a safety report or a TECDOC should also be considered.

The Chairperson and the United Kingdom supported the views expressed by France in relation to the graded approach and the need to ensure that any documents produced deal adequately with the small user. The United Kingdom offered to assist in developing appropriate text on this issue.

WHO welcomed the development of a document dealing with safety culture, noting that this is an important issue in the healthcare setting. This is already covered in GSR Part 3 and WHO is working with IAEA and the professional societies to raise awareness. Too often, people do not distinguish between safety and safety culture; they are different, and good safety culture results in a high level of safety. In the medical area, an integrated approach needs to be applied to the many different practices that are carried out in any given facility.

Brazil commented that a graded approach to safety culture is very important as it needs to be applied to a different extent across a range of facilities. On the issue of safety and security, Brazil saw difficulties in addressing them jointly in a safety guide. Brazil also commented that the CSS is a safety committee and any policy discussion needs to include those with responsibility for security.

RASSC noted that the resolution table and the revised DPP incorporating the comments from Member States was not available in advance of the meeting. RASSC considered that the DPP needed further development, and that a holistic view needs to be taken as to how the issues of leadership, management and safety culture are addressed across the entire suite of safety guides. RASSC asked the Secretariat to develop a proposal that adequately addresses the needs of small users, either by including material in an annex to a safety guide or by developing a separate document.

Consequently, RASSC did not approve the DPP, as presented.

**Action:** The Secretariat to revise the DPP and present to a future RASSC meeting.

**R6** RADIATION PROTECTION DOCUMENTS UNDER DEVELOPMENT

**R6.1** Draft Safety Guide: Application of the Concept of Exemption (DS499)

**R6.2** Draft Safety Guide: Application of the Concept of Clearance (DS500)
RASSC previously agreed that the safety guide Application of the Concepts of Exclusion, Exemption and Clearance (RS-G-1.7) published in 2004 would be revised by developing two new safety guides: Application of the Concept of Exemption (DS499) and Application of the Concept of Clearance (DS500).

In addition, it was decided that the material in RS-G-1.7 dealing with trade in contaminated commodities would be covered by a separate safety report or TECDOC.

The technical officers, Mr. Haridasan Pappinisseri for DS499 and Mr. Vladan Ljubenov for DS500 updated RASSC on the work done to date to develop both documents. They underlined that there is no intention to change the numbers currently in GSR Part 3, but there will be a need to develop additional numbers for such as surface contamination of solid materials, and for liquids and gases. It has been agreed that the issue of exclusion will be covered in both safety guides, with identical text in each. The text will be initially drafted by the experts working on DS499.

Because of the number of overlapping and related issues, a joint Consultants’ Meeting was organized in February 2018. This included some experts who had previously worked on the development of RS-G-1.7 as well as experts with a background in modelling of doses resulting from exposure to surface contamination and with relevant experience in Japan following the Fukushima Daiichi NPP accident.

While the concepts of exemption and clearance have been developed specifically for planned exposure situations, there was extensive discussion on whether the same criteria should be applied to existing exposure situations, such as the management of large amounts of waste generated during remediation activities. Notwithstanding the benefits of applying the same approach and values as for planned exposure situations, the experts advised that remediation is normally subject to regulatory control and therefore can be managed as a planned exposure situation, including the management of generated waste.

There have also been extensive discussions on the issue of conditional clearance and this is a topic of particular interest to Member States involved in decommissioning activities. How to track material that is cleared only for specific uses or applications will need to be covered in the guidance. The difference between clearance and authorization of discharges will also need to be clarified.

When dealing with surface contamination, one can consider grouping radionuclides for surface contamination. It will be necessary to have further discussions on how to practically verify contamination values and to consider if the values for exemption and clearance are appropriate for trade.

The preliminary advice of the consultants is that it may be difficult to complete DS499 on exemption without some reference to international trade. They pointed out that some items in international trade have deliberately added radionuclides (items such as smoke detectors and car headlamps, to which the concept of exemption can be applied), while others are unintentionally contaminated. The importance of a consistent approach to exemption and international trade was underlined. Mr. Pappinisseri noted that there is already a safety guide Radiation Protection and Safety for Consumer Products (SSG-36), the content of which is being taken into account in developing DS499.

In the case of conditional clearance, theft of materials and accidents are considered as low probability activities to which a dose criterion of 1 mSv can be applied.

The second Consultants’ Meeting for DS500 takes place in June 2018 and that for DS499 in July 2018. The technical officers for both documents attend all Consultants’ Meetings.

Czech Republic made several points in relation to both documents

(1) Close cooperation between the technical officers for both documents is essential.
Both safety guides should progress through the various approval steps at the same time.

The difference between the concept of clearance in existing exposure situations and release from regulatory control needs to be clarified.

As previously agreed, guidance on trade in contaminated commodities should not be addressed in the safety guides, but in a separate document.

While it is understood that unconditional clearance takes place at the regulated facility, it is important to clarify if this is also the case for conditional clearance.

Argentina referred to ongoing cooperation between the IAEA and the Autoridad Regulatoria Nuclear (ARN) of Argentina under a Practical Arrangement first signed in 2015. Joint work is currently being undertaken to develop a discussion document on the feasibility of a more harmonized approach to the control of all types of ‘consumer products’³, understood as all items that are routinely bought and sold, including commodities, food and drinking water. Argentina proposed the preparation of a DPP to address this wider definition of ‘consumer products’. Mr. Colgan provided additional information on the matters being considered under the Practical Arrangement and indicated that the discussion document, once finalized, could be brought to RASSC. Mr. Pinak emphasized that the joint IAEA/ARN work would not delay the development of either of the two safety guides DS499 or DS500.

**R6.3 Draft Safety Report: Radiation Protection in Veterinary Medicine**

Ms. Debbie Gilley reminded RASSC that the use of radiation for the diagnosis and treatment of animals is not defined as a medical exposure. However, many applications of radiation in human medicine are being used in veterinary centres around the world. Currently, there is no specific IAEA guidance on radiation usage in veterinary medicine.

The safety report follows the same structure as the safety guide *Radiation Protection and Safety in Medical Uses of Ionizing Radiation* (DS399) with separate sections on diagnostic imaging, nuclear medicine and radiotherapy. Each of these specialties includes guidance relating to the protection of workers, protection of the public, protection of pet owners and, where applicable, emergency response and security considerations.

The report also contains four annexes covering protective clothing for diagnostic and interventional radiology; instructions on the release of animals following the administration of iodine-131 or compounds labelled with iodine-131; spill procedures; and radiation safety features of rooms used for storage and preparation. The HERCA guidelines on training of veterinarians is added as an annex. Ms. Gilley noted that the draft text made available to RASSC for comment has been fully technically edited and is ready for publication.

Belgium welcomed the document, noting the current lack of guidance in this area. The Belgian representative indicated that he had some comments relating to the roles and responsibilities of referring veterinarians and radiological veterinarians, as well as some additional editorial comments, but that he would pass these on directly. HERCA also welcomed the document and thanked the Agency for cooperating with it during the development of the report. Israel commented that much second-hand medical radiological equipment is used on animals and it is important to ensure that it is fit for purpose.

---

³ In the IAEA safety glossary, a ‘consumer product’ is defined as ‘a device or manufactured item into which radionuclides have deliberately been incorporated or produced by activation, or which generates ionizing radiation, and which can be sold or made available to members of the public without special surveillance or regulatory control after sale.’
**Action:** The Secretariat to proceed with publication of the safety report *Radiation Protection in Veterinary Medicine.*

**R6.4 Draft Safety Report: Living and Working in Areas Affected by Past Nuclear or Radiological Events and Activities: Experiences from Affected Areas**

The DPP for the safety report *Living and Working in Areas Affected by Past Nuclear or Radiological Events and Activities: Experiences from Affected Areas* was discussed by RASSC during 2016 and 2017. Ms. Olga German updated RASSC on the work that has been undertaken to date to develop the text and on the future planning schedule.

The document will provide a summary and analysis of the experiences gained from managing situations involving protection of members of the public affected by accidents and on experience gained during the management of contaminated sites. It will bring together all the relevant experience in one publication and provide practical guidance on the development of protection strategies for members of the public living and working in areas contaminated with residual radioactive material.

The report deals with the lessons learned from the political, administrative, economic, agricultural and other decisions taken based on radiological criteria; the radiological criteria themselves are not the main focus of the report. The different social, psychological, political and economic factors that play a part in managing post-accident situations, sites affected by past practices, and areas affected by nuclear weapons testing will be discussed. Practical guidance on the application of the radiological protection principles of justification and optimization, taking account of socioeconomic and other factors, will be provided.

The document will be of interest to governments, regulatory bodies and other authorities and organizations with an involvement in the development and implementation of such protection strategies. This includes the affected populations themselves, and their representatives. Exposure to natural radiation sources and emergency exposure situations are outside the scope of the report.

The first Consultants’ Meeting was held in January 2018 with the participation of experts from Kazakhstan, Ukraine, Japan, France, Canada and ICRP. The structure and content of the report was agreed and there was extensive discussion on the key messages to be delivered. A second Consultants’ Meeting will be held in September 2018 and a Technical Meeting is planned for 2019. The final report should be available in 2020.

WHO asked how the safety report is related to the draft safety guide *Remediation Process for Areas with Residual Radioactive Material* (DS468). Ms. German commented that both documents are linked, but the focus of the safety report is to summarize the collective experience in one document whereas the draft safety guide DS468 will provide guidance to be followed by Member States.

The Chairperson emphasized the importance of a multi-disciplinary approach to the management and rehabilitation of contaminated sites in that a range of different impacts on the local population need to be factored in to the decision-making process. WHO added that psychological effects have not always been given sufficient consideration while Belgium advised that stakeholder involvement in the decision-making process should be covered by the report.

Mr. Pinak commented that the decision to develop the document was to fill a gap in our knowledge as to how certain existing exposure situations have been managed in the past and to bring that collective experience together in one document to assist those who may have to deal with similar situations in the future.

**R7 RASSC WORK PROGRAMME 2018-2020**

**R7.1 Status of RASSC-led Safety Standards and Supporting Documents**
Mr. Tony Colgan summarized the status of safety guides led by RASSC. He also referred to a number of safety reports and TECDOCs that were prepared during the previous term or are currently under development. Two safety guides Radiation Safety of Radiation Sources Used in Research and Education (DS470) and Application of the Concept of Exemption (DS499 – revision of RS-G-1.7) are currently under development but all other safety guides are well advanced and close to or awaiting publication.

RASSC noted that the following six safety guides were published prior to 2014 and, as a result, may not be consistent with either ICRP 103 or GSR Part 3. These are:

1. Categorization of Radioactive Sources (published as RS-G-1.9 in 2005).
6. Control of Orphan Sources and Other Radioactive Material in the Metal Recycling and Production Industries (published as SSG-17 in 2012).

RASSC expressed no opinion on initiating a review process for one or more of these safety guides. The Chairperson agreed that this should be kept under ongoing review and should be discussed again at a future meeting.

R7.2 Priorities for the Eighth Term 2018-2020

The previous RASSC meeting in November 2017 discussed priorities for the forthcoming three-year term 2018 to 2020. Thirteen possible work areas were identified, and these were reduced to five following a ranking carried out online. These were:

1. Implementation of GSR Part 3 (International Basic Safety Standards - the BSS).
4. Radionuclides in Food and Drinking Water.
5. Use of Radiation Sources to Expose People for Non-Medical Purposes.

The remaining eight items were the following:

6. Optimizing Radiation Protection of Workers.
7. Radon in Homes and Workplaces.
9. Uncertainties, Conservatism and Proportionality in Assessment and Practice.
10. Management of Existing Exposure Situations.

The Chairperson invited RASSSC to review the priorities proposed by the outgoing Committee and to consider additions to, deletions from or changes to the list.
Singapore commented that it has observed a two- to three-fold increase in the natural radionuclide content of building materials in recent years due to the incorporation of waste materials such as fly ash; it considered that this is an issue of increasing importance on which guidance is required. This position was supported by Ireland, who noted that many regulations already exist for managing other toxins in building materials and that work on radionuclides should make use of, and be consistent with, this existing framework. Ireland added that gamma radiation from building materials is probably a more important exposure pathway than radon exhalation.

France referred to the extensive work carried out by the European Commission and by HERCA on the control of natural radionuclides in building material and advised that this experience should be shared. Brazil noted that the use of waste and recycled materials as a component of building materials is both a dilution and a clearance issue and suggested that this needs to be addressed in the safety guide DS500.

The Secretariat recognized the importance of this issue in that it has received some recent requests for advice. Limited guidance has been published in the safety guide Protection of the Public against Exposure Indoors due to Radon and Other Natural Sources of Radiation (SSG-32). Work has recently started to develop a technical document on building codes and corrective actions for radon in buildings and it might be possible to include additional material in that publication. Mr. Pinak suggested the possibility of a future Topical Session on building materials. This was supported by WHO, who considered that such a session could usefully be extended to cover all consumer products, in line with paragraph 5.22 of GSR Part 3.

FAO reported on an emerging trend in food and product irradiation. Surface irradiation is being preferred over chemical treatment and many smaller facilities are installing online irradiation units rather than sending their products to larger facilities for treatment. The online units use X-radiation or e-beams rather than radionuclides such as cobalt-60 or caesium-137. While perhaps not an immediate priority, FAO asked that this issue be considered when the relevant safety guides are being reviewed.

Ireland referred to the new dose conversion factors for radon recently published by the ICRP, indicating that these will give rise to communication and other challenges for national authorities. This was supported by Czech Republic, which underlined the importance of clear communication to explain why the dose conversion factors had changed. The Secretariat informed RASSC that UNSCEAR is presently working on a report Lung Cancer from Exposure to Radon and to Penetrating Radiation. After this report is published in mid-2019, the Agency intends to organize a Technical Meeting to discuss both the ICRP and UNSCEAR reports and to consider if changes need to be made to the corresponding requirements and guidance in the IAEA Safety Standards.

Czech Republic noted that medical exposures are not covered by any of the priorities for the forthcoming term and suggested that additional guidance is required in the area of nuclear medicine. WHO commented that the new safety guide Radiation Protection and Safety in Medical Uses of Ionizing Radiation (DS399), which is expected to be published shortly, covers nuclear medicine and experience gained during its implementation will help identify the need for additional guidance.

United Arab Emirates referred to the issue of aircrew and space crew, advising of the need to be proactive in addressing the radiation protection implications of commercial flights at higher altitudes and the advent of space tourism. The Secretariat commented that radiation exposure of aircrew is covered by the safety guide Occupational Radiation Protection (DS453), but there is no coverage of space crew or space tourism.

Indonesia underlined the importance of ethical considerations in radiation protection and the need for further guidance on optimization.
RASSC accepted that work would still be undertaken on those items not ranked as one of the top five priorities and, on that basis, did not make any changes to the listing developed by the outgoing Committee. The Chairperson noted that this should not prevent new issues being raised and asked RASSC members and observers to consider if any of the items could be addressed as a Topical Session, and to bring forward proposals.

**R7.3 Report on the BSS Workshop in Oman**

Mr. Haridasan Pappinisseri informed RASSC about a BSS Workshop that was organized in the Sultanate of Oman on 8-12 April 2018. The workshop was attended by 43 participants from 12 separate national organizations with responsibility for various aspects of radiation protection.

The main topics covered in the workshop were the following:

1. Overview of radiation safety standards.
2. GSR Part 3 requirements, including changes from the 1996 edition.
3. The framework for occupational radiation protection.
4. Medical uses of ionizing radiation
5. NORM, with a focus on the oil and gas industry.
6. Use of radiation sources for inspection purposes and for non-medical human imaging.
7. Radon.

Presentations were made by experts from Australia, Norway and the IAEA.

Mr. Pappinisseri commented that the main challenge is a lack of awareness of the requirements in GSR Part 3. There is not a single regulatory body for radiation protection and a need for better coordination between the responsible agencies dealing with the health, industrial and education/research sectors was identified. At the end of the workshop there was general agreement that much work is needed both at the governmental level and in the field to improve the overall radiation safety programmes in the Sultanate. Mr. Pappinisseri noted that this and other BSS Workshops receive extra-budgetary funding from the United States and he thanked them for their support.

Brazil commented that having a single regulatory body is not always the most appropriate way to manage radiation protection issues. WHO added that there are many examples where medical exposures fall within the remit of two or more different national authorities and, provided they cooperate with each other, this can work effectively. Mr. Pappinisseri agreed that effective cooperation and communication is essential for successful regulation.

**R7.4 Report on the BSS Workshop in South Africa**

Ms. Olga German informed RASSC about a BSS Workshop organized in South Africa on 7-9 May 2018. While South Africa has regulations in place for a number of years for the protection of workers and the public in uranium and other NORM mining activities, to date only limited work has been undertaken on managing exposure of the public due to radon in homes and other buildings.

The workshop was attended by 18 participants from the national regulatory body, local municipal authorities, health protection authority, service providers and independent scientists. During the workshop the requirements of GSR Part 3 related to public exposure to radon were discussed and experts from Austria, Switzerland and the United States presented their experiences in developing a national radon action plan.
The last day of the workshop was dedicated to planning actions within the Technical Cooperation national project SAF0007 which will support the national work on introducing and enforcing radon requirements. The following steps and strategies to implement and enforce the requirements of GSR Part 3 related to public exposure to radon were agreed:

1. Policies and regulation documents.
2. Content of a radon action plan.
3. HR capacity and training.
4. Technical capacity.

Ms. German acknowledged the financial support from the United States. She also informed RASSC that further BSS Workshops were being planned for Bahrain and Morocco in November and December 2018 respectively.

South Africa commented that the management of existing exposure situations had been raised during its IRRS mission in 2016. This is now a priority issue for the National Nuclear Regulator. The workshop was very successful and South Africa thanked the Agency for its support.

**R7.5 Proposal to Review the IAEA Safety Fundamentals**

This is discussed under agenda item R3.1

**R8 THE IAEA RADIATION SAFETY PROGRAMME**

**R8.1 Status of Work in relation to Radionuclides in Food and Drinking Water in Non-Emergency Situations**

The project *Radionuclides in Food and Drinking Water in Non-Emergency Situations* was established in October 2017 in response to the General Conference resolution GC(61)/RES/8 requesting the Secretariat ‘to develop principles for harmonized guidance on radionuclide activity concentration values in food and drinking water, in continued cooperation with relevant international organizations and national authorities’.

A Steering Group chaired by Norway was established and met for the first time in December 2017. A joint Secretariat of FAO, IAEA and WHO has also been established. The Steering Group advised that the reference level of 1 mSv for food should consider the doses from both naturally-occurring as well as artificial radionuclides, as is the case for drinking water. To assess the implications of such an approach, a survey of the scientific literature published in the 20-year period from 1998 and 2017 has been initiated and, in addition, Member States have been asked to provide their national monitoring data for naturally-occurring radionuclides in food over the same time period. The output from this data collection and review exercise will be used by WHO to assess the range of radiation doses associated with the different cluster diets it maintains in its Global Environmental Monitoring System (GEMS) database. This work will update the assessment carried out previously by UNSCEAR and published in its 2000 Report.

As part of discussions with international experts, it has been noted that the concentrations of polonium-210, which concentrates in seafood and can be an important contributor to radiation dose, may be considerably lower in farmed products compared to those caught in the wild. The situation regarding other naturally-occurring radionuclides is unknown. Given the increasing contribution of aquaculture (fish farming) to the worldwide supply of seafood, the Steering Group also advised that this be investigated further.

Both FAO and WHO referred to the close cooperation between the three International Organizations in implementing the project. FAO underlined the fact that the same approach used for other food
contaminants is being applied to radionuclides. WHO informed RASSC that it has recently finalized new guidance material *Management of Radioactivity in Drinking Water*. The document covers both emergency and existing exposure situations and is written in a ‘question and answer’ format, and is supported by several case studies. It is expected to be posted on the WHO website within the next few weeks.

France advised that the final document should put the risks from radionuclides in food in context with other food contaminants, such as pesticides. France also referred to the importance of developing guidance on radon in drinking water and noted that dose-conversion factors for ingested radon have been published in ICRP 137.

France noted that, while some coastal communities have a higher-than-average consumption rate of shellfish, the average national consumption is 5 kg and the resulting annual radiation dose due to ingested polonium-210 is of the order of 0.1 mSv. FAO added that, for certain regional diets, the key food/radionuclide combination is radium-226 in cereals rather than polonium-210 in seafood.

EC referred to the restrictions on the radionuclide concentrations in imported foods that were implemented in the aftermath of the Fukushima Daiichi NPP accident and those that have been in place since the Chernobyl accident. In both cases, maximum permitted concentrations have been established for a range of different foods. The Czech Republic underlined the importance of using the European experience in developing future guidance.

Brazil noted the problems with total diet sampling and asked if this would be covered in any final guidance document. Mr. Colgan replied that the work currently being undertaken is establishing the scientific baseline for the project and the sampling of total diet has not yet been discussed by the Steering Group. However, this has already been identified by the Secretariat as an important topic for future consideration.

Mr. Pinak noted the high visibility of this project within the Agency and its Member States. He emphasised that the final guidance will not take a position on the approach adopted by Japan in responding to the Fukushima Daiichi NPP accident.

**R8.2 The Work Programme of the International Commission on Radiological Protection (ICRP)**

Mr. Chris Clement summarized the work programme of ICRP and identified its future priorities. The ICRP Strategic Plan is structured around three key objectives: to maintain and continue to improve the system of radiological protection; to increase engagement with professionals, policy-makers and the public; and to promote awareness of radiological protection and broaden access to ICRP recommendations. A key recent initiative is the development of ICRPaedia, where information on all aspects of the system of radiological protection is readily available.

Mr. Clement summarized the main work areas of ICRP, noting that there are 23 active task groups dealing with a range of different issues. He highlighted the draft publication *The Use of Effective Dose as a Risk-related Radiation Protection Quantity*, which is currently available for comment with a deadline of 3 August 2018. The use of radiation in medicine and the range of applications is increasing, bringing with it new challenges. Protection of the environment is a relatively new issue that will be addressed in a number of upcoming publications. Discussions are also taking place on the need to address the radiation protection of animals in veterinary medicine.

ICRP has identified the most important issues that may need to be addressed over the next five years. These can be summarized under the headings of effects, concepts and organization as follows:

**Effects**
Definition of health.

Classification of effects.

Low-dose and low-dose rate risk.

Individual radio-sensitivity.

Detriment beyond cancer and hereditary effects.

Protection of children.

Concepts

Individual dose limitation.

Social and economic factors in optimisation.

What is protected in protection of the environment.

Tolerability and reasonableness.

Organising Radiological Protection

Categories of exposure, especially in relation to the environment.

Relationships between exposure situations.

Exposure situations and protection tools.

This work is underpinned by a review of protection quantities and consideration of the balance between science and ethics. While consideration in being given to preparing the next set of ICRP Recommendations to supersede ICRP Publication 103, this is unlikely to be initiated in the next three to five years.

Ireland congratulated ICRP on the initiative of developing ICRPaedia, which it found to be a very useful source of information. Ireland asked about the extent to which ICRP considers implementation by the regulator in developing its recommendations and how it establishes priorities. Mr. Clement responded that ICRP operates at the level of fundamentals and principals and does not develop guidance. As such, implementation is not an issue, although of course ICRP takes care not to make recommendations that are impractical. In terms of priorities, ICRP has a long-term vision of the issues it needs to address but also has the flexibility to respond to new issues as they emerge.

Ms. Olga German referred to the different geometry that needs to be considered when one is exposed to environmental sources (e.g. when working on the remediation of contaminated land) compared with other radiation sources. She also questioned whether space tourism can be deemed to be justified and advised that this is an issue on which guidance would be helpful. FAO referred to the trend in food and product radiation raised under agenda item R7.2 and asked ICRP to consider the implications of such technological changes.

R8.3 Work Programme of the Nuclear Energy Agency’s Committee on Radiation Protection and Public Health (CRPPH)

Ms. Olvido Guzman summarized the work of the Nuclear Energy Agency’s Committee on Radiation Protection and Public Health (CRPPH). She described the work being undertaken related to emergency preparedness and response, which is overseen by the CRPPH Working Party on Nuclear Emergency Matters. The NEA recently organized the INEX 5 emergency exercise and follow-up workshop where lessons learnt were shared between participants. In 2020, a workshop on EPR in the nuclear and non-nuclear fields will be organized jointly with WHO.

A new CRPPH initiative is related to global low-dose research coordination i.e. in the dose region below and well below about 100 mGy. A scoping meeting will be held in Milan on 17-18 September 2018. The purpose of the meeting is for representatives of research-funding organizations to share expectations, resolve questions and have in-depth discussions on various pertinent issues, including
the nature of ongoing research as well as any cooperation and coordination efforts underway. The
meeting will be immediately followed by the 5th Science and Values Workshop in Radiological
Protection Decision Making.

Of relevance to RASSC is the Expert Group on sharing lessons learned on implementing the ICRP
recommended equivalent dose limit for the lens of the eye for occupational exposures (EGDLLE) which
has recently been established. In August 2018, the NEA will host an international radiation protection
school to allow future leaders to learn from today’s experts. The event is organized in cooperation
with the Swedish Radiation Safety Authority and the Centre for Radiation Protection Research of
Stockholm University and is fully booked with 75 participants.

India commented that in the area of risk communication, too much emphasis is placed on the
emergency situation and, as radiation protection professionals, we need to communicate more
effectively with the public on the more general radiation issues. This includes putting radiation risks
in context with other everyday risks.

R8.4 Work Programme of the United Nations Scientific Committee on the Effects of Atomic
Radiation (UNSCEAR)

Mr. Ferid Shannoun informed RASSC that UNSCEAR is a Committee of the United Nations General
Assembly established in 1955 with the mandate to evaluate the level and effects of ionizing radiation.
It consists of scientists nominated by 27 Member States of the United Nations and four observer
scientists (Algeria, Iran, Norway and United Arab Emirates). The UNSCEAR secretariat is based in
Vienna but is administrated by the UN Environment, which is based in Nairobi.

UNSCEAR currently has five ongoing projects as follows

(1) Selected evaluations of health effects and of risk inference due to radiation exposure.
(2) Evaluation of medical exposures to ionizing radiation.
(3) Evaluation of occupational exposures to ionizing radiation.
(4) Lung cancer from exposure to radon and to penetrating radiation.
(5) Biological mechanisms influencing health effects from low-dose radiation exposure.

At its 2018 annual meeting, a further three proposals for future will be considered

(1) Secondary primary cancer after radiotherapy.
(2) Epidemiological studies of radiation and cancer.
(3) Levels and effects of radiation exposure due to the accident at the Fukushima Daiichi nuclear
power station: implications of information published since the 2013 UNSCEAR Report.

Another important focus for UNSCEAR is implementation of the Committee’s long-term strategic
directions, including discussion of a concept of operations of standing working groups (SWGs). The
Committee consider the establishment of an ad hoc working group to elaborate the Committee’s
future programme of work from 2020 onwards.

Mr. Shannoun also highlighted that a project on the collection and analysis of data on radiation
exposures of workers, patients and the public from natural and artificial sources is ongoing. UNSCEAR
has established a network of National Contact Persons and data has already been received from over
40 countries. He thanked the many national and international partners who support UNSCEAR in its
work, especially the IAEA and WHO. In his conclusions, he also highlighted that UNSCEAR’s findings
provide the scientific basis underpinning the development and implementation of the international
radiation protection standards.
Written submissions were received from International Organizations in advance of the meeting and these were made available on the RASSC website. No oral presentations were made and there were no specific questions on the available reports. The Chairperson encouraged everyone to read the reports and inform themselves about the current activities and priorities in other International organizations.

R10 CLOSING OF THE MEETING

R10.1 Any Other Business

There was no other business.

R10.2 Dates of Future Meetings

Mr. Colgan informed RASSC that the next meeting will be held during the week of 19-23 November 2018 and will include a joint session with the Waste Safety Standards Committee (WASSC). Dates have also been set and meeting rooms reserved for the remaining meetings of the term up to the end of 2020. The dates can be found at the end of the meeting agenda.

R10.3 Conclusions of the Meeting

The Chairperson thanked all participants for their contribution to the discussions and the success of the meeting. She noted the actions to be taken by the Secretariat regarding the approval of the three safety guides DS419, DS420 and DS434 and the need to develop a proposal on how to address leadership, management and safety culture in a consistent manner in the relevant safety guides. Finally, she underlined the importance of the Electronic Working Group to be established to review the Safety Fundamentals and the CSS Working Group to develop a safety report on the UNSCEAR Report and encouraged all RASSC members to propose nominations to both Groups.

R10.4 Closing

The meeting was formally closed by Mr. Miroslav Pinak, who thanked the Chairperson for her efficient management of the meeting. He underlined the importance of the decisions reached and assured RASSC of the full support of the Secretariat in progressing their work.

ENDS
Annex I

List of Actions

Action: The Secretariat to circulate all RASSC members and observers requesting their NUCLEUS user name, user ID and e-mail address so that they can be registered to provide feedback.

Action: The Secretariat to invite nominations from RASSC members to join the Electronic Working Group to review the IAEA Safety Fundamentals.

Action: The Secretariat to invite RASSC members to nominate experts to join the CSS Working Group to develop a safety report on issues raised by the UNSCEAR Report.

Action: The Secretariat to make the final text of the draft safety guide *Radiation Safety of Accelerator Radioisotope Production Facilities* (DS434) available for online review and approval by the end of July 2018 with a deadline for submission of comments by mid-September 2018.

Action: The Secretariat to submit the draft safety requirements *Site Evaluation for Nuclear Installations* (DS484) to the CSS for endorsement.

Action: The Secretariat to make the final text of the draft safety guide *Radiation Protection and Safety in Well Logging* (DS419) available for online review and approval by the end of July 2018 with a deadline for submission of comments by mid-September 2018.

Action: The Secretariat to make the final text of the draft safety guide *Radiation Protection and Safety in the Use of Nuclear Gauges* (DS420) available for online review and approval by the end of July 2018 with a deadline for submission of comments by mid-September 2018.

Action: The Secretariat to submit the draft safety guide *Preparedness and Response for an Emergency during the Transport of Radioactive Material* (DS469) to Member States for comment.

Action: The Secretariat to submit the draft safety guide *Establishing the Safety Infrastructure for a Nuclear Power Programme* (DS486) to the CSS for endorsement.

Action: The Secretariat to revise the DPP and present to a future RASSC meeting.

Action: The Secretariat to proceed with publication of the safety report *Radiation Protection in Veterinary Medicine.*
## Annex II

### AGENDA

**44th Meeting of the Radiation Safety Standards Committee (RASSC)**

**6-8 June 2018**

**Vienna International Centre**

**Meeting Room C-2, C-Building**

### Wednesday 6 June 2018 at 09:30

<table>
<thead>
<tr>
<th>R1.</th>
<th>Opening of the Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1.1</td>
<td>Introduction and Welcome</td>
</tr>
<tr>
<td>R1.2</td>
<td>Chairperson’s Introduction</td>
</tr>
<tr>
<td>R1.3</td>
<td>Adoption of the Agenda</td>
</tr>
<tr>
<td>R1.4</td>
<td>Chairperson’s Report of RASSC 43</td>
</tr>
<tr>
<td>R1.5</td>
<td>Administrative Arrangements</td>
</tr>
<tr>
<td>R1.6</td>
<td>Actions from RASSC 43</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R2.</th>
<th>General Safety Standards Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>R2.1</td>
<td>Procedures for the Development and Approval of Safety Standards</td>
</tr>
<tr>
<td>R2.2</td>
<td>The NSS-OUI Platform</td>
</tr>
<tr>
<td>R2.3</td>
<td>Using the Committees’ Website</td>
</tr>
<tr>
<td>R2.4</td>
<td>Report of the 43rd Meeting of the Commission on Safety Standards</td>
</tr>
<tr>
<td>R2.5</td>
<td>Holistic Review of the Set of Safety Guides</td>
</tr>
<tr>
<td>R3.</td>
<td>UNSCEAR Report: Attributing Health Effects to Ionizing Radiation Exposure and Inferring Risks</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>R3.1</td>
<td>Opinion of the Commission on Safety Standards</td>
</tr>
<tr>
<td>R3.2</td>
<td>Review of Safety Standards in light of the UNSCEAR Report: Request from the CSS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R4.</th>
<th>Safety Standards for Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>R4.1</td>
<td>Draft Safety Guide: Radiation Safety of Accelerator Radioisotope Production Facilities (DS434)</td>
</tr>
<tr>
<td></td>
<td>(also to EPReSC, NUSSC, TRANSSC, WASSC and NSGC)</td>
</tr>
<tr>
<td>R4.2</td>
<td>Draft Safety Requirements: Site Evaluation for Nuclear Installations (revision of NS-R-3) (DS484)</td>
</tr>
<tr>
<td></td>
<td>(also to EPReSC, NUSSC, TRANSSC, WASSC and NSGC)</td>
</tr>
<tr>
<td>R4.3</td>
<td>Draft Safety Guide: Radiation Protection and Safety in Well Logging (DS419)</td>
</tr>
<tr>
<td></td>
<td>(also to EPReSC, TRANSSC and NSGC)</td>
</tr>
<tr>
<td>R4.4</td>
<td>Draft Safety Guide: Radiation Protection and Safety in the Use of Nuclear Gauges (DS420)</td>
</tr>
<tr>
<td></td>
<td>(also to EPReSC, TRANSSC and NSGC)</td>
</tr>
<tr>
<td>R4.5</td>
<td>Draft Safety Guide: Preparedness and Response for an Emergency during the Transport of Radioactive Material (DS469)</td>
</tr>
<tr>
<td></td>
<td>(also to EPReSC, TRANSSC)</td>
</tr>
<tr>
<td>R4.6</td>
<td>Draft Safety Guide: Establishing the Safety Infrastructure for a Nuclear Power Programme (Rev. 1) (revision by amendment of SSG-16) (DS486)</td>
</tr>
<tr>
<td></td>
<td>(also to EPReSC, NUSSC, TRANSSC, WASSC and NSGC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R5.</th>
<th>DPPs for Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>R5.1</td>
<td>Leadership, Management and Culture for Safety (revision and merging of GS-G-3.1 and GS-G-3.5) (DS513)</td>
</tr>
<tr>
<td></td>
<td>(also to EPReSC, NUSSC, TRANSSC, WASSC and NSGC)</td>
</tr>
<tr>
<td>R6.</td>
<td>Radiation Protection Documents under Development</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>R6.1</td>
<td>Draft Safety Guide: Application of the Concept of Exemption (DS499)</td>
</tr>
<tr>
<td>R6.2</td>
<td>Draft Safety Guide: Application of the Concept of Clearance (DS500)</td>
</tr>
<tr>
<td>R6.3</td>
<td>Draft Safety Report: Radiation Protection in Veterinary Medicine</td>
</tr>
<tr>
<td>R6.4</td>
<td>Draft Safety Report: Living and Working in Areas Affected by Past Nuclear or Radiological Events and Activities: Experiences from Affected Areas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R7.</th>
<th>RASSC Work Programme 2018-2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>R7.1</td>
<td>Status of RASSC-led safety standards and supporting documents</td>
</tr>
<tr>
<td>R7.2</td>
<td>Priorities for the Eighth Term 2018-2020</td>
</tr>
<tr>
<td>R7.3</td>
<td>Report on the BSS Workshop in Oman</td>
</tr>
<tr>
<td>R7.4</td>
<td>Report on the BSS Workshop in South Africa</td>
</tr>
<tr>
<td>R7.5</td>
<td>Proposal to Review the IAEA Safety Fundamentals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R8.</th>
<th>The IAEA Radiation Safety Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8.1</td>
<td>Status of Work in relation to Radionuclides in Food and Drinking Water in Non-Emergency Situations (FAO, IAEA and WHO)</td>
</tr>
<tr>
<td>R8.2</td>
<td>The Work Programme of the International Commission on Radiological protection (ICRP)</td>
</tr>
<tr>
<td>R8.3</td>
<td>Work Programme of the Nuclear Energy Agency’s Committee on Radiation Protection and Public Health (CRPPH)</td>
</tr>
<tr>
<td>R8.4</td>
<td>Work Programme of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)</td>
</tr>
</tbody>
</table>
R9. Reports from International Organizations

Reports from International Organizations will be posted on the RASSC website in advance of the meeting. These will be open for discussion, but no formal presentations are envisaged.

R9.1 Food and Agriculture Organization of the United Nations (FAO) C. Blackburn
R9.2 International Labour Organization (ILO) P. Jimenez
R9.3 Pan American Health Organization (PAHO) F. Shannoun
R9.4 United Nations Environment Program (UNEP) F. Shannoun
R9.5 United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) F. Shannoun
R9.6 World Health Organization (WHO) M. Perez
R9.7 European Commission (EC) S. Mundigl
R9.8 Nuclear Energy Agency / Organization for Economic Co-operation and Development (NEA/OECD) Y. Hah
R9.9 European Nuclear Installation Safety Standards Initiative (ENISS) B. Lorenz
R9.10 Heads of the European Radiological Protection Competent Authorities (HERCA) K. Petrova
R9.11 International Commission on Radiological Protection (ICRP) C. Clement
R9.12 International Radiation Protection Association (IRPA) R. Coates
R9.13 International Source Suppliers and Producers Association (ISSPA) R. Wassenaar
R9.15 World Nuclear Association (WNA) B. Shah
R9.16 International Electrotechnical Commission (IEC)

R10. Closing of the Meeting

R10.1 Any other business R. Bly
R10.2 Dates of Future Meetings T. Colgan
R10.3 Conclusions of the Meeting R. Bly
R10.4 Closing M. Pinak
<table>
<thead>
<tr>
<th>Future Committee Meetings – RASSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>RASSC 45</td>
</tr>
<tr>
<td>RASSC 46</td>
</tr>
<tr>
<td>RASSC 47</td>
</tr>
<tr>
<td>RASSC48</td>
</tr>
<tr>
<td>RASSC49</td>
</tr>
<tr>
<td>International Conference on Radiation Safety: Addressing Challenges in Application</td>
</tr>
</tbody>
</table>
### Annex III

#### List of Participants

Radiation Safety Standards Committee (RASSC)

<table>
<thead>
<tr>
<th>Country</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>Mr Christian Fabián Elechosa</td>
</tr>
<tr>
<td>Australia</td>
<td>Mr Alex Kalaizovski</td>
</tr>
<tr>
<td>Belgium</td>
<td>Mr Lodewijk Van Bladel</td>
</tr>
<tr>
<td>Brazil</td>
<td>Mr Ricardo Gutterres</td>
</tr>
<tr>
<td>Canada</td>
<td>Ms Caroline Purvis</td>
</tr>
<tr>
<td>China</td>
<td>Mr Liye Liu</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Ms Karla Petrova</td>
</tr>
<tr>
<td>Denmark</td>
<td>Mr Haraldur Hannesson</td>
</tr>
<tr>
<td>Egypt</td>
<td>Mr Abdellah Waleed</td>
</tr>
<tr>
<td>Finland</td>
<td>Ms Ritva Bly</td>
</tr>
<tr>
<td>France</td>
<td>Mr Jean-Luc Godet</td>
</tr>
<tr>
<td>Germany</td>
<td>Ms Manuela Richartz</td>
</tr>
<tr>
<td>India</td>
<td>Mr Pankaj Kumar Dash Sharma</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Mr Yus Rusdian Ahmad</td>
</tr>
<tr>
<td>Iran</td>
<td>Mr Ehsan Hoseini</td>
</tr>
<tr>
<td>Ireland</td>
<td>Mr David Fenton</td>
</tr>
<tr>
<td>Israel</td>
<td>Mr Jean Koch</td>
</tr>
<tr>
<td>Japan</td>
<td>Mr Masatsugu Isse</td>
</tr>
<tr>
<td>Korea, Republic of</td>
<td>Mr Jai Kwong Chang</td>
</tr>
<tr>
<td>Norway</td>
<td>Mr Sindre Overgaard</td>
</tr>
<tr>
<td>Poland</td>
<td>Mr Szymon Kawa</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>Mr Sergey Mikheenko</td>
</tr>
<tr>
<td>Singapore</td>
<td>Mr Hoo Wee Teck</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Ms Nina Jug</td>
</tr>
<tr>
<td>South Africa</td>
<td>Ms Louisa Mpete</td>
</tr>
<tr>
<td>Spain</td>
<td>Ms Carmen Álvarez García</td>
</tr>
<tr>
<td>Sweden</td>
<td>Ms Ann-Christin Haegg</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Mr Andreas Leupin</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Ms Tetiana Pavlenko</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>Ms Aayda Al Shehhi</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Ms Liz Thomas</td>
</tr>
<tr>
<td>United States of America</td>
<td>Mr Daniel Collins</td>
</tr>
</tbody>
</table>

#### Advisors

<table>
<thead>
<tr>
<th>Country</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Ms Fiona Charalambous</td>
</tr>
<tr>
<td>France</td>
<td>Mr Yann Billaran</td>
</tr>
<tr>
<td>Germany</td>
<td>Ms Annemarie Schmitt-Hannig</td>
</tr>
<tr>
<td></td>
<td>Ms Annegret Guenther</td>
</tr>
<tr>
<td>Iran</td>
<td>Mr Ahmad Karamloo Gheseljeh</td>
</tr>
<tr>
<td>Japan</td>
<td>Mr Isao Kawaguchi</td>
</tr>
<tr>
<td></td>
<td>Mr Hirokazu Tachikawa</td>
</tr>
<tr>
<td>Korea, Republic of</td>
<td>Mr Young-Sub Lee</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>Mr Anton Kuryndin</td>
</tr>
</tbody>
</table>
United Arab Emirates  Ms Ameena Al Abdouli
United Kingdom  Mr John Lindberg
United States of America  Ms Cindy Flannery

United Nations Organizations
FAO  Mr Carl Blackburn
UNSCEAR/UNEP  Mr Ferid Shannoun
WHO  Ms Maria Perez

International Organizations
EC  Mr Stefan Mundigl
NEA/OECD  Ms Olvido Guzman
ISO  Mr Jean-Francois Bottollier

Other Organizations
ENISS  Mr Bernd Lorenz
HERCA  Ms Karla Petrova
ICRP  Mr Chris Clement
IRPA  Mr Roger Coates
ISSPA  Mr Richard Wassenaar
Mr Wolfgang Fasten
WNA  Ms Binika Shah