INTERNATIONAL ATOMIC ENERGY AGENCY

DIVISION OF RADIATION, TRANSPORT AND WASTE SAFETY

Radiation Safety Standards Committee (RASSC) – Forty-seventh Meeting

20-22 November 2019

IAEA HEADQUARTERS, VIENNA, AUSTRIA
R1 OPENING OF THE MEETING

R1.1 Introduction and Welcome

The meeting was opened by Mr Miroslav Pinak, Head of the Radiation Safety and Monitoring Section, who welcomed all participants. He thanked their respective governments for nominating them to participate in the 47th meeting of RASSC. He referred to important agenda items, namely safety guides for approval covering site remediation, research reactors and handling of fissile material. While all address radiation protection issues, the document dealing with remediation is of particular current relevance and it is important to have a full consensus on its content. The Secretariat would also like to report on the recent discussion on radon dose conversion factors and the outcome of the Technical Meeting which took place 1 to 4 October 2019 in Vienna. This Technical Meeting considered the recent assessment from the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSEAR) together with the report of the International Commission on Radiological Protection (ICRP) on dose coefficients for occupational intakes of radionuclides.

Mr Pinak cited the development of the BSS requirements and competing interests (such as security concerns) in the area of non-medical human imaging practices and therefore, a Topical Session on Non-Medical Human Imaging with six presentations covering experiences and practices from Member States, has been organized. He informed the meeting that there would be a report on the progress of the preparations for the International Conference on Radiation Safety to be held in Vienna during 9-13 November 2020, including the four regional workshops conducted as a pre-cursor to the conference. There would also be feedback from Singapore in using the NSS-OUI platform (Online User Interface) that would enhance the review and revision of safety standards.

Finally, Mr Pinak informed RASSC that Mr Tony Colgan has suffered a family bereavement and that Mr Haridasan Pappinisseri had kindly agreed at short notice to act as Scientific Secretary for this meeting; he thanked Mr Pappinisseri for his acceptance. Mr Pinak also apologized that due to the budgetary position the Secretariat would not be hosting a reception.

R1.2 Chairperson’s Comments

The Chairperson, Ms Ritva Bly, thanked Mr Pinak for his welcome and opening remarks. She welcomed Mr Haridasan Pappinisseri as Scientific Secretary for the meeting. Ms Bly thanked all participants, noting the overarching issue for the current term of RASSC of implementing General Safety Requirements Part 3. One of the most challenging issues is that of non-medical human imaging and the sharing of experiences may help with understanding and resolution of the underlying principles. Ms Bly also referred to the reports from workshops and other events that will be presented and are important for regulatory work.

Ms. Bly welcomed the new RASSC members Mr Sandor Kapitany from Hungary and Mr Michael Layton from the United States. She informed the meeting that regrets had been received from Belgium, Canada, India, Lithuania, Malaysia, New Zealand, Poland, USA and organizations ICRP and the Pan American Health Organization (PAHO). Alternate observers were attending the meeting on behalf of Argentina, Austria, Czech Republic, France, Germany, Singapore, World Health Organization (WHO) and World Nuclear Association (WNA). The chairperson also welcomed Australia, Norway and United Arab Emirates who joined the meeting via online streaming.

R1.3 Adoption of the Agenda
There were additions to the agenda items R2.2 - information on DS513 and R8.5 - information on the forthcoming convention on nuclear safety. With these proposed additions the Agenda was approved.

R1.4 Chairperson’s Report of RASSC 46

Editorial comments on the draft Chairperson’s Report of RASSC 46 were received from Australia and IRPA. The revised report was posted on the RASSC website on 7 November 2019 and the draft report of the first joint session with EPreSC was posted on 30 September 2019. No comments were received from either RASSC or EPreSC on the draft report of the joint session. Ms Bly reminded that there were interesting sessions on communication and on small modular reactors that were very informative and encouraged members to revisit the useful reports. There were no comments from the floor and the Chairperson’s Report for RASSC 46 and for the joint session with EPreSC were therefore approved.

After the meeting some minor editorial comments were received from EPreSC.

R1.5 Administrative Arrangements

Mr Pappinisseri thanked the management and RASSC chairperson for the confidence extended to him. He 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 is forbidden in all areas of the VIC, including in the central plaza. He conveyed that all presentations would be posted to the RASSC website.

R1.6 Actions Arising from RASSC 46

Mr Pappinisseri informed RASSC that the draft safety guide Preparedness and Response for an Emergency during Transport of Radioactive Material (DS469) was approved for submission to the CSS. Revision of two inter-related Specific Safety Guides on Research Reactors as a set of publications: SSG-20 and SSG-24 (DS510) were submitted to the Member States, with a deadline of 22 November 2019 for comment.

Out of the four draft safety guide DPPs approved at the last meeting, three are being submitted to the next meeting of the CSS for endorsement—1) Leadership, Management and Culture for Safety (DS513); 2) Radiation Protection Aspects of Design for Nuclear Power Plants (revision of NS-G-1.13) (DS524); and 3) Protection of Workers against Exposure due to Radon (DS519). While approving DS519, minor structural changes have been agreed and ILO expressed strong support for potential co-sponsorship. The DPP: Radiation Protection Programmes for the Transport of Radioactive Material (revision of TS-G-1.3) (DS521) was not approved following the committee’s concern over how emergency preparedness and response is addressed, consistency with DS469 and extensive comments by ILO on lack of consistency with GSR Part 3 requirements. This DPP is included as agenda item R2.1 in the current meeting.

Other actions include: The Secretariat to provide the Note Verbal for the Technical Meeting on Implications of the New Dose Conversion Factors for Radon to all RASSC members and observers. This was circulated on 2 July 2019 and the meeting was held during October 1-4, 2019; The Secretariat to invite RASSC members and observers to make a presentation at the RASSC 47 meeting in November 2019 on experience in using the NSS-OUI platform. The request was circulated on 1 October 2019 and Singapore volunteered; and The Secretariat to keep RASSC informed on progress in relation to the proposed project on radiation protection terminology. In this regard, RASSC was informed that a final decision can only be taken once the budget for 2020-2021 is confirmed.

Following this presentation, Argentina asked for clarification on two topics related to DS519. Regarding co-sponsorship of the safety guide by ILO, this is necessary for two reasons: it is relevant to the ILO convention and there is an agreement between IAEA and ILO on the use of activity concentrations on which occupational exposure is based. Argentina added that terminology such as
“new dose conversion factors” has to be carefully used. In response, Mr Pinak commented that there are no issues with ILO in this regard. He agreed that terminology should be used with caution. However, in this case the term “new dose conversion factors” was used for the technical meeting and currently interpreted as new, based on ICRP dose coefficients.

R2 DPPs FOR APPROVAL

R2.1 Draft Safety Guide: Radiation Protection Programmes for the Transport of Radioactive Material (revision of TS-G-1.3) (DS521)

The Chairperson referred to the fact that the DPP was introduced to RASSC in the previous meeting (Joint Session with EPreSC) and not approved and the DPP is now being brought to the Committee for a second time with the previous comments having been addressed. Mr Eric Reber presented the updated DPP. He informed that DS521 is to revise TS-G-1.3 to meet the requirements of SSR-6 Regulations for the Safe Transport of Radioactive Material. Significant changes have been made in the section on emergency preparedness and response. Inputs from working group 1 of TRANSSC 33 and comments from Member States were considered in the revised DPP. Mr Reber noted that TRANSSC approved the DPP in the most recent meeting held in October 2019.

A total of 18 comments were received from four Member States on the revised DPP. The resolution table on these comments was posted on the Committee’s website in advance of the meeting. Changes made include information about the intended audience, scope to cover criticality and GSR Part 3, clarified interface with other safety guides, significant changes on emergency preparedness and response section (section 9), and deletion of the previous section 4 dealing with basic elements of radiation protection programme in assessing occupational doses.

IEC asked for clarification if the guide will provide any requirements or recommendations for emergency workers. Mr Reber replied that the guide will refer to the relevant requirements and provide only recommendations; for emergency workers the topic is addressed in the revision of the safety guide Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material (TS-G-1.2). The Secretariat commented that guidance on emergency workers is addressed in section 4 of the Safety Guide on Occupational Radiation Protection (GSG-7).

Japan stated that revision of section 9 dealing with EPR was proposed by Japan in the previous meeting and Japan now agreed with the revised content.

There were no further questions and comments and RASSC approved the DPP for submission to the CSS for endorsement.

Action: The Secretariat to forward the DPP for the draft safety guide Radiation Protection Programmes for the Transport of Radioactive Material (DS521) to the CSS for endorsement.

R2.2 Draft Safety Guide: Leadership, Management and Culture for Safety (revision of GS-G-3.1) (DS513)

The Chairperson informed that the DPP was approved by RASSC in the previous meeting. The lead Committee, NUSSC, met after the RASSC meeting and while approving the DPP requested a more comprehensive table of contents as well as greater clarification on interfaces with the content of other documents. Accordingly, the DPP was presented to RASSC for a second time, for information.

Mr Peter Tarren presented the DPP with the detailed sub sections in each chapter. He mentioned that in order to address the comment on interfaces, an additional sentence was added in section 5 explaining the scope of the safety guide. Mr Tarren explained that this safety guide will provide the generic high-level core principles of leadership, management and culture for safety and appropriate
specific guidance would be addressed in relevant topical specific safety guides. In addition, he provided a diagram that showed how DS513 was aligned with GSR Part 2 and how other specific guides would not overlap with DS513 in terms of technical content.

The Chairperson asked if the presentation was available on the RASSC website and Mr Pappinisseri confirmed that the presentation would be posted that evening. Regarding drafting, Mr Tarren replied that this is already in the early stages. He also noted, however, that the previous technical officer had left the Agency and that new resources, possibly a consultant, were being sought to carry out the work.

Ms Bly remarked that the information was useful within the context of some of the agenda items for approval during the meeting.

R3 SAFETY STANDARDS FOR APPROVAL

R3.1 Draft Safety Guide: Remediation Strategy and Process for Areas Affected by Past Activities or Events (DS468)

Ms Tamara Yankovich presented the draft Safety Guide on behalf of herself and the co-technical officer Ms Michelle Roberts. She provided background information on DS468, including the interface with other safety standards, recent changes made and a summary of the comments received, together with their resolution. She noted that the content of the document is complex, with a wide scope that includes remediation in existing exposure situations for areas affected by past activities and post-accident events. The first review of the draft was undertaken by the Committees in October 2016 and the draft was submitted to Member States for comment in June 2017. Resolutions to comments were completed by September 2017. In November 2017, the Commission on Safety Standards requested that efforts be made to seek co-sponsorship of DS468 by relevant International Organizations (IOs) and this was agreed by all relevant Safety Standards Committees later that month. UNEP, UNOCHA, UNDP and FAO agreed to co-sponsor the Safety Guide and contributors to drafting include the EC, ICRP Task Group 98, ICRU, ISO, and OECD-NEA. A Technical Meeting was held in July 2018, followed by a Consultancy Meeting in November 2018, to gain input on DS468 from IOs and the inputs were included in the draft. This was the second review by the Committee at Step 11 of the review process.

Ms Yankovich gave details of the scope and structure of the draft safety guide. She explained the stepwise process-based approach in remediation: Preliminary evaluation, Detailed evaluation, Planning for Remediation, Implementing Remediation and Post-remediation Management. The draft includes two appendices and seven annexes dealing with case examples as recommended by the Member States. Recent changes include clarification of justification and optimization principles in the context of remediation, application criteria at different steps in the process (reference level, end point criteria and end state criterion), linkage with environmental impact assessment processes and monitoring and clearance criteria.

A total of 107 comments were received from the Committees. Many of the comments were on the proposed Annex VI on Fukushima remediation case study, which was a new addition to the document. Except for two, all comments were accepted. The comments resolution table with a revised draft of the safety guide was posted on Committee’s website.

Argentina asked why NEA was not co-sponsoring the safety guide and suggested to clarify their interest with NEA before submission to the CSS. Ms Yankovich replied that reason was not known, noting that although NEA is not a formal co-sponsor of DS468, NEA has contributed to the development of the document to ensure its consistency with NEA guidance and is a Contributor to DS468. Mr Pinakin informed RASSC that IAEA ensures full transparency and the information on the document was presented twice to the NEA Committee on Radiation Protection and Public Health (CRPPH) and it is a decision for NEA to decide whether or not to co-sponsor IAEA safety guides. As follow up to RASSC 47,
Ms Yankovich contacted NEA and determined that it is not typical NEA policy to formally co-sponsor IAEA safety guides.

Argentina raised a technical issue in chapter 3. In addition to ICRP principles, the IAEA Fundamental Safety Principle 7 referring to the protection of future generations and the environment is particularly relevant for this safety guide and should be addressed. Argentina suggested preparing a note for the CSS on this aspect. The Secretariat replied that the document addresses the relevant subjects including trans-boundary issues, protection of the environment etc that were linked to Fundamental Safety Principle – 7 and agreed to clarify the text in Section 3 of DS468 to highlight the importance of this principle as a fundamental reason to consider remediation.

Israel pointed out that in para 3.1 of the safety guide Fundamental Safety Principle 10 is referred to and it is a general understanding that all fundamental safety principles are relevant. Therefore, either this reference to a specific fundamental safety principle should be replace with a more generic reference to the Fundamental Safety Principles as a whole. Ms Bly remarked that usually the requirements have been quoted in most safety guides. Mr Pinak agreed and mentioned that these principles were always an integral part of safety standards and are included more on a conceptual basis than for use at the practice level guidance. Mr Delattre commented that the Fundamental Safety Principles were a set of one package and should be used coherently and one should not take just one principle and elaborate on it in guidance documents. Argentina clarified that it was not to take out just one principle but to refer to the solid system of protection of the environment that is in place. Ms Yankovich replied that GSG-10 is already referenced in the draft; however, in view of the comment further checks will be carried out.

Japan commented on the section on management of residues, where paragraph 9.21 includes the statement “residual material should be cleared”. There were no references or criteria for clearance and so the text requires further clarification. Ms Yankovich replied that it was not possible to be prescriptive, as DS468 covers a broad range of existing exposure situations and therefore, criteria for a specific case need to be set based on the specific prevailing circumstances, applying the principles of justification and optimization of protection and safety. In addition, Ms Yankovich noted that DS468 is meant to complement DS500, which will provide guidance on how to set clearance criteria. Therefore, appropriate approaches to be followed have been mentioned and linked to the clearance guidance (RSG1.7 and DS500). Japan asked if, in such remediation situations, the criteria for clearance in planned exposure situations could be changed and other criteria could be used depending upon the situation. In reply, Ms Yankovich stated that a graded approach with appropriate criteria can be used, focused on the long-term objectives for remediation. Further, Japan noted paragraph 9.24 regarding recycling and disposal in affected areas is referred to as specific clearance and no reference or criteria are mentioned. Ms Yankovich replied that the draft safety guide DS500 has been included as a reference in DS468 as suggested by the Safety Standards Committees in the past to address this. In addition, Mr Pinak explained that the draft is generic one and it is difficult to include site specific issues. Regulatory authorities should consider all those specific factors in applying the requirements for remediation depending upon the local situation and Agency is open to offer assistance through bilateral cooperation on any specific issues that Member States would like to address.

RASSC noted that WASSC, as the lead Committee, approved the draft for submission to the CSS for endorsement. Following the discussion, RASSC approved the document for submission to the CSS with the suggestion to bring a note to the CSS regarding the particular comment in relation to the Safety Fundamentals. Mr Pinak mentioned that this document is much needed by decision-making agencies in the Member States in the current context and thanked the Committee for its support.

As follow up to RASSC 47 and in advance of EPReSC 9, Ms Yankovich updated Section 3 of DS468 to highlight the importance of Fundamental Safety Principle 7, as suggested by Argentina. The new text was reviewed and agreed by Argentina in advance of EPReSC 9, where it was presented, and will
form the basis of the note to the CSS. The change suggested by Israel was agreed during discussions during RASSC 47, and the agreed changes were incorporated in the appended updated version of DS468 in advance of EPReSC 9.

**Action:** The Secretariat to submit the draft safety guide: Remediation Strategy and Process for Areas Affected by Past Activities or Events (DS468) to the CSS for endorsement.

**Action:** The Secretariat to submit a note to the CSS clarifying how the Fundamental Safety Principle-7 is addressed in this Safety Guide (DS468).

**R3.2 Draft Safety Guide: Revision by amendment of 8 Specific Safety Guides for Research Reactors as a set of publications (NS-G-4.1 to NS-G-4.6, SSG-10 and SSG-37) (DS509)**

Mr David Sears presented the draft safety guide DS509 revising several existing safety guides related to research reactors (NS-G-4.1, 4.2, 4.3, 4.4, 4.5, 4.6, SSG-10 and SSG-37). These eight inter-related safety guides were revised as a set of publications to address newer safety requirements in SSR-3, to cover sub-critical assemblies, expand on design extension conditions, explain the interface between nuclear safety and security and to incorporate experience and feedback from Fukushima accident. The structure and scope of each of these guides were essentially same except few changes in NS-G-4.4 and NS-G-4.6.

A total of 519 comments were received from the various Committees. The number of comments received against each safety guides were: NS-G-4.1 58 comments from 8 MS; NS-G-4.2 50 comments from 8 MS; NS-G-4.3 84 comments from 8 MS; NS-G-4.4 110 comments from 10 MS; NS-G-4.5 52 comments from 8MS; NS-G-4.6 55 comments from 7 MS; SSG-10 41 comments from 5 MS and SSG-37 65 comments from 5 MS. Revised drafts and tables with the resolution of comments were posted on the Committee’s website in advance of the meeting.

Several questions were raised by the RASSC Chairperson, namely: 1) Regarding terminology – In GSR Part 2 there are requirements on senior management, operating organizations, reactor management etc. What is the relationship between these and how is this addressed in the guide? Mr Sears replied that consistency was ensured, and the term operating organization was used consistently throughout the guides. 2) It was noted that the terms review, assessment, independent audit, audit, internal audit was used in different contexts and need to ensure consistency. Mr Sears replied that in most cases these are part of management system. Audit is on specific actions such as procurement items, audit of suppliers etc. Ms Bly requested to check the use of these terms carefully. 3) The terms quality management, testing, integrated management system etc. need to be used consistently when referring to higher-level documents. Mr Sears replied that this will be checked and assured consistency with requirements documents and other standards. 4) It is not clear why human and organisational factors were missing in the integrated management system. Mr Sears explained that this was already raised in the Committee’s comments and accepted. In the revised draft this was already included. 5) Regarding co-ordination with the generic guide on management systems DS513, Mr Sears mentioned that the guidance documents now being considered are specific to practices for research reactors and consistency with GSR Part 2 and with the generic guidance will be ensured. Ms Bly added that there is still further scope for improvement and expressed the hope that relevant issues will be captured during the Member States’ review period. She also encouraged all RASSC members to read those drafts even if there were no research reactors in their countries as there are many useful learning topics.

There were no further comments and RASSC approved the DS509 for submission to Member States for comments.
Action: The Secretariat to submit the draft safety guide: Revision by amendment of 8 Specific Safety
Guides for Research Reactors as a set of publications (NS-G-4.1 to NS-G-4.6, SSG-10 and SSG-37) (DS509) to the Member States for comment.

R3.3 Draft Safety Guide: Criticality Safety in the Handling of Fissile Material (revision of SSG-27) (DS516)

Mr Juraj Rovny presented the draft safety guide revising the existing specific safety guide SSG-27 mainly addressing relevant requirements in SSR 4,5,6 and GSR Parts 4,5,6 and 7. The main revisions were to use proper terminology for example, ‘credible abnormal conditions’, ‘nuclide composition’ etc; harmonization with SSR-4 requirements on criticality safety (Requirements 38 and 66); specific guidance related to “verification and validation of calculational models”; and to update references. Mr Rovny noted that the draft safety guide was approved by WASSC and TRANSCC for submission to Member States in their meeting held in October 2019.

A total of 109 comments were received from 12 Member States and one international organization (ENISS). Most comments were accepted, and a resolution table was posted to the Committee’s website prior to the meeting.

Argentina noted that the document is important and cited a major conference held in Paris two months ago on criticality safety. Argentina suggested as a minimum to provide a reference to the conference and to the new code presented in that conference by IRSN. Mr Rovny replied that the Annexes in the draft safety guide provides many references including several codes and validation reports. He assured that further consideration would be given in this regard. Further comment from Argentina was on the issue of lack of proper quantity to measure exposure in a criticality accident. This was the case from the Tokai Mura accident endorsed by a report from NIRS, Chiba and the issue has not resolved still and urged RASSC for addressing the issue of the appropriate quantity. Ms Bly noted that the issue is interesting, however, this should perhaps be addressed by ICRU. In addition, Mr Pinak mentioned that the Secretariat recognizes this issue and it can be discussed in RASSC as an item raised by Argentina with the option of bringing the discussion to the responsible agencies for further possible guidance. Mr Rovny further stated that the last chapter in the guide gives guidance on dose assessment and the Japanese experience from Tokai Mura was included.

Following this discussion, RASSC approved the draft safety guide for submission to the Member States for comment and Ms Bly mentioned that Secretariat will continue discussion on the issue of appropriate measuring quantity for exposure assessment in criticality accidents. Mr Pinak assured that the information will be brought to the attention of the ICRU during the regular meetings of the relevant organizations.

Action: The Secretariat to submit the draft safety guide: Criticality Safety in the Handling of Fissile Material (revision of SSG-27) (DS516) to the Member States for Comments.

Action: The Secretariat to bring the lack of appropriate exposure measurement quantities for criticality accidents to the attention of ICRU.

R4 DOSE CONVERSION FACTORS FOR RADON

R4.1 Technical meeting: Implications of the new Dose Conversion Factors for Radon – Report from the Secretariat

Ms. Olga German presented the summary of the Technical Meeting Implications of the New Dose Conversion Factors for Radon held in Vienna during 1-4 October 2019. A briefing note on the summary of this meeting was provided in advance of the meeting on RASSC website. The history of radon dose conversion factors was summarised as shown in the table below.
<table>
<thead>
<tr>
<th>Publication</th>
<th>Public</th>
<th>Workers</th>
<th>Nominal risk coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICRP Pub.65 Protection Against Radon-222 at Home and at Work</td>
<td>4 mSv WLM(^{-1})</td>
<td>5 mSv WLM(^{-1})</td>
<td>2.83 x 10(^{-4}) WLM(^{-1})</td>
</tr>
<tr>
<td>ICRP Pub.115 Lung Cancer Risk from Radon and Progeny</td>
<td>9 mSv WLM(^{-1})</td>
<td>12 mSv WLM(^{-1})</td>
<td>5 x 10(^{-4}) WLM(^{-1})</td>
</tr>
<tr>
<td>ICRP Pub.137 Occupational Intake of Radionuclides</td>
<td>-</td>
<td>10 mSv WLM(^{-1})</td>
<td>5 x 10(^{-4}) WLM(^{-1})</td>
</tr>
<tr>
<td>ICRP - Residential exposure to radon (publication expected)</td>
<td>10 mSv WLM(^{-1})</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>UNSCEAR 2006 and 2019 reports</td>
<td></td>
<td></td>
<td>5.7 mSv WLM(^{-1})</td>
</tr>
</tbody>
</table>

The requirements in GSR Part 3 addressing existing exposure situation specify 300 Bq/m\(^3\) for dwellings and 1000 Bq/m\(^3\) for workplaces as the maximum value of a reference level for radon (Rn-222). Footnotes 55 and 57 of GSR Part 3 indicate that these concentrations correspond to an annual effective dose of the order of 10 mSv assuming an equilibrium factor of 0.4 and annual occupancy of 7000 h (dwellings) and 2000 h (workplaces). For planned exposure situations, GSR Part 3 establishes individual dose limits that include all exposure pathways from a given source.

Ms German explained the differences between annual effective doses that correspond to the radon reference level concentrations using UNSCEAR dose conversion factors and ICRP 137 dose conversion factors are about a factor of two. For dwellings, a radon concentration of 300 Bq/m\(^3\) corresponds to an effective dose of 7.6 mSv/a; for workplaces 1000 Bq/m\(^3\) to 7.2 mSv/a using the UNSCEAR value; and 14 mSv/a and 13.4 mSv/a respectively using ICRP 137 values. Further, for occupational exposure in planned exposure situations the dose limit of 20 mSv can be equated to a radon concentration of 2770 Bq/m\(^3\) using UNSCEAR value and 1500 Bq/m\(^3\) using the ICRP 137 dose conversion. Against this background, the IAEA organised the technical meeting to discuss the implications of these recently published dose conversion factors for the BSS requirements on radon.

Ms Ruth McBurney, Executive Director of the Conference of Radiation Control Program Directors, USA chaired the technical meeting attended by 56 participants representing 33 Member States. There were 25 national presentations in the technical meeting: Algeria, Australia, Brazil, Canada, Czech Republic, Estonia, France, India, Indonesia, Iran, Ireland, Japan, Jordan, Slovenia, Morocco, Peru, Poland, Portugal, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom, USA and two oral statements from Norway and Netherlands. Both UNSCEAR and ICRP gave presentations on dose conversions factors and the basis on which their values were derived. WHO participated in the meeting and ILO provided a statement that was read into the record.

The technical meeting noted that some Member States still use ICRP 65 DCFs. New ICRP DCFs for workplaces result in higher estimated doses and may lead to more regulatory control efforts. Several Member States raised the need for a harmonized approach and noted that the new dose conversion factors have significant impact on national regulations and the system of radiological protection for residential and occupational exposure. Member States are seeking appropriate guidance from the IAEA for radon protection strategy and use of dose conversion factors.

The technical meeting recommended that there was no need for immediate changes to GSR Part 3. However, the Agency should issue a position paper with advice to the Member States and covering the following issues: 1) use of a DCF of 10 mSv/WLM (ICRP Publication 137) as a single default DCF for workplaces in existing and planned exposure situations, unless different DCF is justified by specific aerosol characteristics where appropriate; 2) use of the same DCF of 10 mSv/WLM for dwellings, recognising that measurement and control measures use air concentrations (Bq/m\(^3\)) and do not require dose estimation; 3) use of a DCF of 5 mSv/WLM for assessment of exposure due to thoron.
(ICRP 137); 4) retain the current values of Reference Levels, expressed in radon activity concentrations of 1000 Bq/m³ and 300 Bq/m³, for managing radon exposure in existing exposure situations; and 5) explain that applying the new ICRP DCFs results in higher doses than is currently the case, but Member States may always establish lower Reference Levels than those in GSR Part 3 i.e. there is a need to focus on optimization.

The technical meeting requested UNSCEAR and ICRP to clearly communicate on the appropriate application of their respective DCF and use of the equilibrium factor (F) for radiation protection purposes; and IAEA to communicate justification of any changes and/or no-changes to the Member States. Ms German confirmed that results of the discussion in RASSC will be presented to the Inter-Agency Committee on Radiation Safety (IACRS), which includes representatives of all international organizations cosponsoring GSR Part 3, in early 2020 and subject to agreement, a position paper will be issued by IACRS in 2020. After the position of UNSCEAR and ICRP on the appropriate application of their respective DCF and use of the equilibrium factor (F) is communicated to IAEA, it will be distributed to the TM participants and to RASSC.

Following this presentation, the Chairperson opened the discussion. Argentina clarified certain aspects related to UNSCEAR and suggested that before the discussion there are some basic principles to be agreed by all. UNSCEAR is a Committee with an independent voice and IAEA regularly participated in past meetings. If, for any reason, the Agency misses UNSCEAR meetings there exist further opportunities for interaction such as through the UN General Conference in New York where IAEA has a full time representative or by sending letters to UNSCEAR seeking information that was needed. Argentina noted that UNSCEAR is not a radiation protection body abut rather a scientific body of the UN General Assembly with a responsibility to study and report the levels and effects of ionizing radiation. UNSCEAR data and evaluation reports are approved by 192 Member States of the United Nations.

Argentina further underlined the role of the ILO in relation to occupational standards, which are legally binding based on ILO conventions. Therefore, any standard on occupational exposure should be agreed by the ILO. At the same time, Agency safety standards are not linked to any legally binding agreement. For any standards that have implications for radiation protection of workers, such as radon in this case, must be agreed by ILO which is a tripartite organization with representatives of trade unions. Argentina continued that ICRP recommendations were not mandatory for the Agency. Everyone agrees with the three principles of the ICRP – justification, optimization and dose limitation; however, the Agency has a fourth principle on protection of the environment. The four principles of the Agency are coherent when compared to ICRP. Therefore, RASSC should respect that UNSCEAR speaks with an independent voice and is not a radiation protection body; any standard that has implications on occupational exposure should be agreed by the ILO and ICRP recommendations are not mandatory for the Agency. Moreover, Member States have every freedom to deviate from the Agency Standards if they are not appropriate for local needs.

Mr Pinak responded to the comments from Argentina and said that there were no conflicts between different organizations in the ongoing work of the radiation protection against radon. The Secretariat fully respects the role and responsibilities of UNSCEAR and was invited to, and took part in, all relevant UNSCEAR meetings. He agreed that UNSCEAR is not a radiation protection body. However, their reports are important in formulating radiation protection requirements. Mr Pinak informed that ILO has always been fully involved in every single document related to radiation protection of workers and there were no conflicts. ILO was fully involved in developing guidance on radiation protection of workers against radon, in particular paragraph 3.4 of the BSS and also in applying the requirement of planned exposure situations and existing exposure situations for workers. He agreed that ICRP recommendations were not mandatory. However, the Agency liaises with ICRP through formal agreements, participation in ICRP meetings etc to ensure harmonized view for implementing the
recommendations. In addition, Agency supports Member States to have their own choice and flexibility and helping them to avoid non-compliance with Agency standards.

Israel noted the significant differences between the two dose conversion factors and asked for presentations from ICRP and UNSCEAR on their scientific basis. In reply, the Secretary of UNSCEAR mentioned that the UNSCEAR Secretariat presented the conclusions of the work in the Technical Meeting of the Agency as well as in the Fourth UN General Assembly. The report on radon was not yet published and expected in the first quarter of next year. UNSCEAR would avoid any interpretation and comparison with the ICRP values and differences. UNSCEAR confirmed that there is a close collaboration with the IAEA and the radon report was provided to the IAEA for comment prior to being finalized. Following the technical meeting, the IAEA request was presented to the bureau of UNSCEAR for response. In addition, the Secretary of UNSCEAR underlined the very large uncertainties in radon measurements and results, which do not support the need to change the dose conversion factors UNSCEAR have previously published. On a specific question whether the UNSCEAR dose conversion factors apply to workers or the public, it was clarified that UNSCEAR always uses one dose conversion factor for both workers and public. Ms German confirmed that all presentations of the technical meeting are available, and a link can be shared with RASSC. Ms Bly requested to provide the link to the RASSC members.

Ireland thanked the Agency for organising the technical meeting and noted that there is a real confusion in Member States on the application of the dose conversion factors for radon. While Ireland fully respects the positions of UNSCEAR and ICRP, greater clarity on the application of the dose conversion factors for radiation protection against radon is essential. Ms Bly stated that communication is important for clarity in the application. United Kingdom supported this view and requested UNSCEAR and ICRP to provide additional clarity in the application of dose conversion factors and further stated that until this clarity was given, the Agency should not move further in changing or review of the GSR Part 3 requirements.

IEC enquired whether any technical experts related to measurement and equipment were involved in the decisions of UNSCEAR and ICRP and considered that if there is no harmonization, there will be confusion among users.

Mr Pinak underlined the importance of the RASSC discussion and comments. He considered it was not appropriate for the Agency to judge the correctness of different dose conversion factors and will wait for ICRP and UNSCEAR to provide the requested clarification, following which the Agency will inform Member States. Argentina fully agreed with the Secretariat decision not to mediate and cautioned that the Agency has statutory obligations with UNSCEAR as well as commitments on occupational exposure to radon in terms of ILO conventions. Mr Pappinisseri clarified that relevant guidance on occupational exposure to radon is available in the recently-published safety guide Occupational Radiation Protection (GSG 7), which is cosponsored by the ILO.

France commented that it would be difficult for Member States to have different dose conversion factors for radiation protection purposes (worker dose evaluation) and public exposure assessment.

Ms German clarified that the purpose of the technical meeting was to discuss implications of the dose conversion factors and not their application or the correctness of the values. Mr Pinak added that the Agency has been trying to assist Member States in optimising radiation protection and different methodologies obviously might result in different results. Each particular situation should be evaluated, taking account of national regulatory approaches and practical considerations.

Brazil supported the statement of Ireland and requested additional clarity. Brazil urged UNSCEAR and ICRP for a scientific explanation on why a scientific factor cannot be applied for radiation protection purposes and commented that political explanation would result in serious legal consequences in
Member States. Brazil also underlined different philosophical approaches in optimization as well as their difficulties.

EC (European Commission) informed that a document on radon in workplaces would be published in early 2020 that would help EU Member States in meeting the requirements in the European Basic Safety Standards Directive.

United Kingdom asked when the statements would be available to RASSC. Ms German replied that the ICRP statement was already on the RASSC website and the UNSCEAR statement would be provided soon after the receipt.

Argentina supported the comment from Brazil on legal implications and mentioned that implications are enormous and should be taken into account seriously. Ireland added that legal implications have driven Member States to carefully look at the subject.

The Secretariat commented that the discussions at the technical meeting and at RASSC will be summarized in a statement on the IAEA website. Further action would be taken to discuss the issue in the Inter-Agency Committee (IACRS) and subject to agreement a position paper will be issued.

Ms Bly commented that radon is one of the most important and topical issues in radiation protection and closed the discussion.

Action: Based on the discussion at RASSC, the Secretariat to publish a web article on dose conversion factors for radon.

Action: The Secretariat to discuss radon dose conversion factors in the Inter-Agency Committee for Radiation Safety (IACRS) and, subject to agreement, to issue a joint position statement.

**R5 DOCUMENTS UNDER DEVELOPMENT**

**R5.1 Development of Guidance on Application of the Concepts of Exemption (DS499) and Clearance (DS500) – Update from the Secretariat**

Mr Pappinisseri reviewed and summarized the work undertaken to date in developing the two new safety guides Application of the Concept of Exemption (DS499) and Application of the Concept of Clearance (DS500) under the direction of RASSC and WASSC respectively. He noted that, since the DPP was approved by the Commission on Safety Standards in November 2017, RASSC has been updated on progress in relation to both documents at each of its meetings. Mr Pappinisseri reported specifically on the progress made after the Technical Meeting that took place on 19 to 22 March 2019. Both drafts were reviewed and updated significantly based on the inputs from the Technical Meeting.

Since the previous RASSC meeting, the key topics discussed and addressed in DS499 draft include: 1) how to apply the concepts of exemption and clearance in dealing with moderate and bulk quantities of material containing radionuclides of natural origin; 2) how to address existing exposure situations and trade in commodities; 3) Other primordial radionuclides that are not available in tables of BSS; 4) exclusion; 5) How to treat a mixture of radionuclides i.e. artificial, natural, artificial + natural, radon; 6) Issues related to construction materials, consumer products, post-accident situations; 7) Interpretation of trivial dose, explanations on “of the order of 10 μSv” and “of the order of 1 mSv”; 8) applicability of the BSS Schedule I Tables; 9) specific exemption cases, radiation generators, type approved equipment, surface contaminated items; and 10) frivolous use of materials and justification. Many of these topics are also discussed and addressed in the DS500 draft. In addition, some specific issues were discussed such as 1) radionuclides of natural origin coming from authorized practices – radiological basis for exemption and clearance 2) exemption and clearance of material/waste from remediation actions, 3) decision making – what to compare with exemption and clearance levels (mean value, mean value + total uncertainty, mean value + Nσ, N=1,2,3).
Mr Pappinisseri informed RASSC that work is continuing with the aim of submitting the drafts to the Committees by March 2020 and to begin the drafting of the associated safety report on trade next year. He also mentioned that WASSC was also updated on the status of both DS499 and DS500 two weeks ago.

While opening the discussion, Ms Bly mentioned that there are many tricky issues to be resolved in applying the concepts of exemption and clearance.

FAO sought clarification on how natural radionuclides are dealt when they are artificially produced such as Po-210 or H-3. Mr Pappinisseri replied that for moderate quantities exemption values are available however, for bulk quantities the approach is on a case-by-case basis.

Argentina commented that the presentation was comprehensive and pointed out several issues of concern to RASSC. Basically, there are three issues that are related to different exposure situations, coherence with exemption and clearance and issues with natural and artificial radionuclides. Originally ICRP used “extant” situations and not “existing” situations and standards were not expected to change the protection of people irrespective of the situations. RASSC should consider possible solutions to these problems. Argentina asked why there should be two separate guides for exemption and clearance and mentioned that in the CSS meeting while approving the DPP there was a suggestion that at certain point of time, combination of the documents should be considered and requested the Secretariat to consider combination of both safety guides into one single document. Regarding radionuclides incorporated into consumer goods, the need for a policy decision was emphasized.

Ms Bly mentioned that RASSC discussed the DPP and decided to move with two separate guides for exemption and clearance. In addition, Mr Pinak added that the decision was made considering different user target groups. The Secretariat will implement this decision, as agreed, as well as any future decision to merge both documents.

Korea asked what type of issues arose from the technical meeting that need any resolution from RASSC at this stage and requested the opportunity to review the draft. Mr Pappinisseri provided some examples that require further consensus and asked for Korea’s patience to wait for the final draft until early next year. South Africa commented that radon should be regulated separately and not included in dose estimates to comply with exemption or clearance requirements. Ireland supported this view and informed the meeting that a HERCA working group on the topic is of the opinion that radon should be dealt separately. Ms German added that the IAEA safety report on building and construction material currently being drafted also endorses the treatment of radon exposure pathways separately.

IEC commented that any values for compliance should be measurable and there are relevant IEC standards for performance criteria for radiation detection instrumentation. These standards should be appropriately referred and IEC offered its support. ISO mentioned that relevant ISO standards should also be referenced.

Argentina commented that ICRP previously published advice that the concepts of exclusion, exemption and clearance should be considered together as linked components determining the scope of regulatory control.

IRPA commented that it was difficult to comprehend the safety regime where the controls applied depend on how the material might be used in the future. Mr Pinak replied that when decisions on exemptions are taken, future use of the material need to be considered from a radiological protection point of view. Mr Pappinisseri commented that currently the system becomes complex with the introduction of the concepts of existing exposure situations.

The Chairperson remarked that the presentation is for information, that no decision is required at this time and closed the discussion.
R5.2 Development of a Safety Report on Attributability of Radiation Health Effects and Inferring Risks – Update from the Secretariat

Ms Asfaw summarized the background to the UNSCEAR 2012 report, the resulting directions from the CSS and progress made in the development of the Safety Report since last RASSC meeting. Following agreement on the DPP, drafting of the report began in September 2019 with volunteers from all the Safety Standards Committees and the CSS. The work is ongoing and expect to prepare a first draft by early 2020, with planned further consultancy meetings to update and agree the content. RASSC will be updated on the progress and the approved draft will be shared to the Committee members. The final text will not be submitted to the Committees for approval but Committee comments will be taken into account in finalizing the text.

Ms Bly appreciated the willingness to share the draft with Committee members. ENISS asked if all the previous discussion and comments in the Committees were taken into account. Ms Asfaw replied that all those comments were considered. EC asked if the DPP will be made available to the Committees. Ms Asfaw confirmed that both the report of the consultancy meeting and the approved DPP are already available on the RASSC website.

R6 TOPICAL SESSION: NON-MEDICAL HUMAN IMAGING

The Topical session was chaired by Ms Anki Hägg, RASSC member from Sweden

R6.1 Non-Medical Human Imaging – Requirements and Guidance in the IAEA Safety Standards

Ms Olga German provided an overview of the Safety Guide SSG-55 (Radiation Safety of X-ray Generators and Other Radiation Sources Used for Inspection Purposes and for Non-Medical Human Imaging) that is currently awaiting publication. There is an increasing use of imaging devices for non-medical purposes such as security-related scanning in airports, cargo scanning, border screening, detecting weapons, immigration checks, postal scanning, employment and insurance-related screening, sports fitness, prisoners scanning etc. Workers and members of the public may be exposed to radiation as part of the use of such equipment. It may also lead to inadvertent exposure of people inside cargo containers, or the exposure of drivers and passengers inside vehicles being inspected. There are requirements in GSR Part 3 in relation to human imaging for non-medical purposes, to strengthen the regulatory control over such practices. The ICRP also addresses Radiological Protection in Security Screening in its Publication 125 [Ann. ICRP 43(2), 2014].

Justification is an important issue in these practices. Non-medical human imaging procedures are normally considered to be not justified. However, there might be exceptional circumstances for which human imaging can only be justified by the government. If the government or regulatory body decide that practices involving human imaging are justified, this generally includes an assessment including availability of non-radiological technology, radiation detriment, doses to workers and the public, potential doses from accidents and appraisal of the benefits of the proposed practice. The government only justifies in the specific case of human imaging for the detection of concealed objects that can be used for criminal acts that pose a national security threat. It is important that relevant government ministries and authorities work in a coordinated manner, particularly with respect to justification and the conditions associated with any justified practice. In the draft Safety Guide, the various practices are divided into two main categories: Category-I imaging using medical radiological equipment performed by trained radiological professional and Category-II imaging using X-ray generators, linear accelerators and other scanning devices operated by non-radiological personnel. For setting dose limits or constraints, the particular imaging requirements need to be considered, (might be similar to medical exposure) for Category-I, whereas, Category-II is considered as public exposure in a planned exposure situation and is subject to the dose limits for public exposure.
The types of radiation sources used in inspection devices and different technologies used were outlined. Responsibilities of the government or regulatory body include provision of a legal and regulatory framework for protection and safety; provision of adequate competence and resources for the regulatory body and requirements for radiation protection and safety. If Category I non-medical human imaging is justified, necessary regulatory controls include: specific authorization for a medical facility, process for justification of the procedure for specific individuals, training of the staff in relation to the types of procedures to be performed, imaging protocols to be used for the procedures to be performed. In the case of Category II justified practices, regulatory controls include: authorisation by registration or licensing, verification of safe operational aspects, ensuring necessary human competence and adequate engineering and design safety.

Argentina clarified if there are any exceptions to justification for human screening in mines for diamonds and in reply it is noted that the only exception is by the government for security purposes. Justification decision is not only based on the involved doses but several other factors of interest; for example, the potential for criminal activities has to be considered. EC referred to the difficulty in justification in relation to concealed objects or drugs detection. It noted that justification at the highest level on the practice and further individual case specific justification is necessary including which agreed facilities for imaging, protocols to be followed and in cooperation with interested parties such as medical, security, regulatory agencies etc.

Brazil mentioned that newer problems are being faced when radiation safety regulators try to enforce requirements in security issues and is not easy from a national perspective, especially in federal and state governing systems.

R6.2 Non-Medical Human Imaging – Experience from the Nordic Countries

Ms Anja Almen presented a summary of a study on non-medical human imaging in medical facilities conducted in the Nordic countries (Denmark, Finland, Sweden, Norway and Iceland). The study included radiological health assessment for employment purposes; for immigration purposes; for insurance purposes; radiological evaluation of the physical development of children and adolescents with a view to a career in sports, dancing, etc.; radiological age assessment; and use of ionising radiation for the identification of concealed objects within the human body. A survey was carried out on the number of practices available in the five countries and the number of procedures carried out per year.

In some states professional divers are imaged while at the same time professional dancers not imaged. It is noted that many asylum seekers came to Europe in 2015 and an increase in imaging procedures was observed. In Norway, imaging is not permitted for insurance purposes. Age assessment practice using imaging occurs in all Nordic countries. In the case of concealed objects detection, Finland, Iceland and Sweden takes the individual to a hospital for imaging. In all countries, authorization is needed for the practice and a procedure exists. In Sweden, regulations eliminate dose limits and dose constraints for non-medical imaging. Finland has authorized several facilities for non-medical imaging purposes. In Norway, a conditional license with limited validity is issued for the use of low-dose x-ray equipment and such conditions include documentation of adequate competence in radiation protection; operators are required to attend a one-day course in both radiation protection and in operation of the equipment; radiation dose per scan must not exceed 5 µSv (number of scans to keep as low as possible); and annual reporting to the authority about the number of persons scanned and the average number of scans per examination. This ensures that the resulting exposure will never exceed the dose limit of 0.25 mSv effective dose per year to any member of the public (the general requirement for the planned use of radiation by any undertaking according to section 6 of the Norwegian Radiation Protection Regulations). In Denmark, scanning is voluntary and individuals that
are examined must be informed about the procedure before the exposure including legislation, health risk, that pregnant women are not allowed to be scanned etc.

In the case of radiological age assessment, a lot of debate has taken place on justification. It is noted that sometimes imaging is allowed for visa and emigration purposes.

China sought clarification in the case of non-medical human imaging how to balance exposed dose and image quality. If it is performed in hospitals in general there is a quality assurance programme. Outside hospitals, quality assurance is ensured in agencies such as customs.

Ireland asked about the syllabus of training for one day course. Main topics are radiation protection covered by authorities and equipment covered by vendors. Denmark clarified that the two-day course covers handling of equipment, radiation protection, image evaluation, what to look for in a scan etc.

**R6.3 Applying the Justification Principle – a Case Study from Australia**

Mr Alex Kalaiziovski described two actual case studies performed in Australia by the federal regulatory authority (ARPANSA) on applying the justification principle and challenges faced in issuing licenses.

Case Study 1 –Proposed use of backscatter X-ray systems for airport passenger screening
Case Study 2 –Authorised use of transmission X-ray system for anti-drug smuggling purposes

Federal and State jurisdictions/regulations posed additional challenges in reaching a unified approach. Following several negotiations with all stakeholders, airport authorities, the state regulator ARPANSA issued a guidance that sets the framework and specifies the criteria to be addressed by the applicant in their Justification Case. It is important that any decision on the justification of a new practice and the need for subsequent optimisation of the radiation exposure be made at an early stage in the process. A formal justification process should be undertaken when considering the use of specific screening systems based on any human imaging technology. The decision to authorise the use of each type of ionising radiation technology for human imaging purposes should be made by the appropriate authority. However, after all the preparation, the government decided that RF ‘mm-wave’ technology is the preferred option. Whole body backscatter X ray systems are not used at airports.

In case study 2, ARPANSA received a licence application from the Australian Customs and Border Protection Service (Customs) to conduct a ‘proof of concept’ trial on the efficiency of the use of transmission X-ray systems for the detection of illicit drugs concealed within the body of suspected drug couriers. A time-limited license was issued to customs authorising an 18-month pilot program with conditions and dose constraints for non-medical human imaging. The licence also specified the information to be recorded and maintained to ensure enough data was available to inform a Justification Case and any further regulatory decisions. Following this, application for an operational license was reviewed, taking into account aspects such as: need for the practice; evaluation of benefits and detrims; available alternatives; the legality of the practice in place, and engagement with multiple government agencies; ethical requirements; measures to address privacy concerns; written information provide to screened persons (English and 33 other languages); the use of interpreters if required; the requirement for informed consent; demonstrated maturity of the operating agency; and the practice should reduce the use of internal concealment as a drug smuggling method.

Further optimisation aspects reviewed included effective dose to scanned persons; dose constraint applied; effective dose to operators; persons selected for scanning - referral from policing and criminal investigation agencies; no mass or random screening; decision to refer suspect for medical imaging based on report provided by radiologists practicing from a major hospital; pregnant women excluded from the scanning procedure and persons in need of protection excluded; restricted access to the scanner room; continuous dose monitoring; interlocks and audible alarms; CCTV monitoring of scanning procedure; safety audits performed as part of routine maintenance; annual radiation surveys...
by radiation safety consultant; established policies and training responsibilities; instructions and
guidelines developed for the practice; and authorised use only by trained personnel. Following this
evaluation, license was issued with conditions such as; quarterly compliance reporting, persons
operating the scanner must be trained, maintenance personnel must appropriately qualified and
trained, approved work procedures, compliance with equipment standards, dose constraint applied,
ensure screening is conducted with discretion.

In summary, there are many challenges in dealing with the requirements for non-medical human
imaging for operators, government and regulators including national uniformity issues, development
of practical guidance, collection of relevant and sufficient data to inform decisions, justification and
authorization of the practice.

Argentina commented that, it is not the optimisation of the practice as mentioned but optimisation
of protection.

Brazil asked if exemption was considered. Mr Kalaiziovski replied that it was considered based on the
case by case provision in the exemption rules. However, he noted that there are cases for repeated
scans and other concerns and decided that when more information is available the decision can be
reviewed.

IEC asked how many passengers were scanned and how many missed. Available statistics were
checked, however, a clear information on how many scanned vs numbers of international travellers
was not available.

Mr Pappinisseri asked about the value of dose constraint used and in reply it was mentioned that the
information is confidential. The regulator does receive data on the number of suspected persons
reaching the dose constraints. ILO clarified whether these numbers and details of persons were
recorded, and it was confirmed that detailed information is recorded by customs.

R6.4 Medical Age Assessment – Legal Background and Practice

Mr Ernst Rudolf presented the medico-legal imaging experience in Austria. He explained different age
assessment cases with examples. From 1997 onwards EU states addressed age determination
problems, and the need to identify the ages of asylum seekers and migrants. The issues related with the
identity within migration context, administrative age assessment based on available evidence,
medical age assessment for assigning age etc were outlined. Radiological age assessment is regulated
as an example of non-medical imaging exposure in European Council Directive 2013/59/EURATOM.
Many cases of identity problems in immigration are faced due to insufficient administrative systems
in the source country. A Study Group on Forensic Age Diagnostics (AGFAD) of German Society for Legal
Medicine recommends: Anamnesis/Physical examination; Left forearm/ hand X-ray, Dental OPT, Thin
slice collar bone CT-scan - only if ossification of forearm/hand skeleton is completed. From these
examinations the interpretations of ranges of possible ages can be carried out. It was also mentioned
that the procedural ‘guarantees’ for minors sometimes place additional challenges.

In summary, for legal cases involving identity issues, human imaging techniques is being used and
needs to be used. Medical age assessment does not claim to determine or approximate an actually
existing ‘chronological’ age in a specific case, instead the more or less wide range of the possible age
is outlined, running on from its lower age limit (‘minimum age’).

Ms Hägg remarked that the discussion was on a sensitive topic.

Brazil commented that we have more questions than answers and the topic is complicated when
considering the triviality of doses and other potential concerns.
Mr John Hynes described the use of radiation in different modern sports medicine area. The radiation imaging techniques are used as a critical diagnostic tool many a times in sports arenas or hospitals. X-rays are generally used as a first line test for sports accidents involving fractures as they are widely available and accessible. In many modern cases imaging facilities are incorporated within the stadium as professional athletes and sports persons need immediate fitness assessment. There are several ethical concerns in using radiation in sports medicine related to lower threshold for imaging, lower threshold to intervene, propensity for multiple studies (sometimes athletes are X-rayed before, during and after the game), and that related to justification and optimization principles. The justification issues are different for an athlete compared with the normal population.

Ms Bly clarified about non-medical imaging in sports medicine, for example imaging needed for fitness in football matches. In his reply, Mr Hynes confirmed that many such cases occur, and newer football stadiums have imaging facilities.

Brazil noted that professional athletes are ‘workers’ and the there is a medical benefit to the individual. Agreed that it is very difficult to delineate medical or non-medical reasons in professional sport.

ILO asked whether the professional bodies have any discussion with the players and representative bodies. It is noted that many times these issues are controversial, and players may lose their contracts.

Ms Valerie Luyckx discussed the ethical aspects related to non-medical human imaging. The presentation covered relevant ethical principles and values in terms of medical, public health and societal fields, ethical implications regarding where and how radiation exposure occurs such as inside or outside medical institutions and provided examples of ethical implications of non-medically indicated radiation exposure as well as ethical obligations of all parties. Key ethical concepts are justice, autonomy, beneficence/non-maleficence, privacy and confidentiality, prudence and precaution, weighing risks and benefits, transparency, respect and proportionality. Ms Luyckx noted that ethical policies enhance public trust.

Several aspects of traditional issues and foundational principles/values in clinical ethics and public health ethics were discussed. Ethical principles in public security (such as airports, museums, hotels, conference centres, events) include autonomy, benefits vs harm, justice, transparency, solidarity and proportionality. In law enforcement (such as screening for drug trafficking, security screening, human trafficking, screening for theft etc) the main ethical principles are justice, accountability and solidarity, in addition to the issues benefit versus harm. This equally holds good for business and industries for example employment purpose, daily imaging of miners, sports etc. There are always conflicting goals: individual rights vs. community needs; efficient use of public resources vs. individual needs; and employer obligations and business interests vs. employee rights.

Central ethical considerations in non-medical human imaging are:

Individual interest vs. the common (public) good
- Medical and non-medical
Balance of system “efficiency” (safety, financial) vs. individual medical and social risk?
What level of risk is acceptable?
- Radiation exposure – dose, duration, frequency?
- Data collection, storage
- Quality of radiation equipment?
How much coercion is justifiable?
- Occupational screening
How to ensure adequate transmission, comprehension of information?

- informed consent – Required? How operationalized? Can someone decline?

Potential medical consequences

- Follow-up if abnormality detected
- Exposure during pregnancy
- Radiation exposure may exacerbate an already increased occupational risk
- Therapeutic misconception and erosion of trust

In conclusion, ethics is integral and relevant and an ethically acceptable balance between risks and benefits for individuals and the public is necessary. Information is always possible and should be an ethical requirement. Use of public resources should be justified. Confidentiality of health and personal information is key in non-medical human imaging. Ethical implications in business/industry is fraught with conflicting priorities. One should not trivialize risk and ethical standards will facilitate trust and public safety.

R6.7 Discussion

Argentina underlined that radiation protection has solid ethical principles.

IRPA asked if non-medical human imaging for body checking or security screening is justified or not.

Ms German clarified that in accordance with Requirement 10 of GSR Part 3 it is not justified. Ms Bly added that in the requirement it is “not normally justified” and in exceptional circumstances a government can justify.

Brazil commented that it is not sure how to address the impact of graded approach in practices involving non-medical human imaging.

In summarizing the Topical Session, Chairperson Ms Anki Hägg noted that it is not an easy task and all presentations were very informative and valuable. She noted the complexity of the subject in dealing with justification and other issues. The ethical aspects are absolutely important when this particular practice is considered and with this remark, Ms Hägg closed the session.

Ms Bly thanked the chairperson of the session and all speakers.

R7 INTERNATIONAL CONFERENCE ON RADIATION SAFETY

R7.1 Report on the Pre-Conference Workshop for the Americas

R7.2 Report on the Pre-Conference Workshop for Africa

Mr Pappinisseri summarized the discussions at the regional workshop for the America region hosted by Argentina and Ms Olga German presented the output of the regional meeting for Africa hosted by United Republic of Tanzania. Both workshops covered exposure of workers, patients and the public in all three exposure situations. At the end of each workshop, participants identified the key issues for which further clarification would be desirable. These outputs formed one of the inputs into discussions of the Programme Committee for the International Conference on Radiation Safety to be held in November 2020.

The Latin American and the Caribbean region workshop was attended by representatives from 14 Member States, namely Argentina, Brazil, Canada, Chile, Costa Rica, Cuba, Dominican Republic, Ecuador, Guatemala, Honduras, Nicaragua, Paraguay, Uruguay and Venezuela. Experts from United Kingdom, Canada and PAHO were also attended.

The workshop noted that the regulatory infrastructure in Argentina, Brazil, Chile and Cuba is much better developed than in other Member States of the LA region, whereas, Guatemala and Nicaragua seem to be weak. Three main issues emerged as being of considerable concern across the region: 1)
Security screening – the role of the regulatory body in justifying and authorizing security screening practices is unclear. Radiation is being used in several countries of the region to screen children to identify their suitability for certain sports and noted that justification and authorization is a challenge. 2) Mining – Several Member States are engaged in non-uranium mining activities and radiation protection in this sector is rather new to many regulatory authorities and need capacity building. 3) Veterinary medicine – diagnosis and treatment of animals using radiation is expanding in the region and need for appropriate radiation protection measures was highlighted including working with the relevant professional societies to improve safety.

The workshop for Africa region was attended by representatives from 24 Member States, namely Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo, Egypt, Eritrea, Ethiopia, Kenya, Lesotho, Mali, Mauritania, Morocco, Niger, Nigeria, Senegal, Seychelles, Sudan, Togo, United Republic of Tanzania, Zambia and Zimbabwe. Experts from Bahrain and France were also attended.

Several Member States in Africa region still do not have a fully functional regulatory body or supporting legislation. Therefore, it was difficult to provide a comprehensive review on lessons learned from the implementation of GSR Part 3 in the region. In general, priorities are to establish an effective authorization and inspection system for sealed sources, human resource and technical development in the medical sector, improve radiation safety in the mining sector and better use of the graded approach. Although there is lack of radiation safety infrastructure for other topical areas, the workshop noted that they are country-specific and currently cannot be considered a priority for the region.

Argentina mentioned that the workshop held in Americas region also discussed two important topics 1) implications of UNSCEAR 2012 report and issues of attribution and inference of risk and how this can influence legal issues; and 2) related to the issue of secondary cancer in radiotherapy. Argentina pointed out there are many issues that are common to all regions and one example is the use of the different terminologies such as commodities, consumer products that add confusion in terms of regulation and public understanding from the current definitions. Such issues need to be addressed in the conference planned for next year. Mr Pinak confirmed that the output of the regional workshops will be taken into account in the programme of the Conference. Regarding terminology, the Agency is planning a future project to address the concerns that exist.

Israel commented that it was sad to see the Africa situation, and as an international community we have failed and may need further discussion on the strategy. Ms German replied that the radiation safety initiatives in Africa started several years later compared to other regions and there is good cooperation among various regulatory authorities in the region as well as Agency assistance through Technical Cooperation programme to improve the situation. Mr Pinak added that there are many challenges with shortage of human resources within Agency radiation safety programmes as well as in the Member States, especially with respect to qualified experts.

Japan asked about the use of the dose limit of 100 mSv. Ms German clarified that in some countries a dose limit of 50 mSv and an additional dose of 50 mSv as reference level is allowed. However, authorities claim that it is not allowed in practice, but it is allowed legally.

Ms Bly commented that it was interesting to gather issues from around the world through pre-conference workshops and noted similar issues for all regions as well as specific issues for a particular region. She asked the opinion of RASSC about this kind of methodology to identify issues when major conferences are organized. Brazil welcomed and supported the inclusion of regional perspectives in the main Conference. Australia mentioned that this is a very effective way to approach common issues. Argentina commented that this is a good initiative organising regional workshops and picking up unresolved issues of concern in the region and making efforts to solve those issues through bilateral
technical projects with the Agency. Mr Pinak confirmed the overall intention and assured to continue efforts to improve the radiation safety situation worldwide.

In closing the discussion, RASSC appreciated the organization of pre-conference workshops and the identification of common and region-specific issues.

**R7.3  Planning for the Conference – Update from the Secretariat**

Mr Pappinisseri reported on the progress made in preparation to the International Conference on Radiation Safety to be held 9-13 November 2020 in Vienna.

The official announcement was developed and published online on Agency web and can be accessed online at [https://www.iaea.org/events/international-conference-on-radiation-safety-2020](https://www.iaea.org/events/international-conference-on-radiation-safety-2020)

Cooperation agreements were reached with international organizations (EC, FAO, ILO, NEA/OECD, PAHO, UNEP and WHO) cosponsoring GSR Part 3. Official posters and flyers have been approved and are awaiting publication. It has also been agreed to organize a trade exhibition as part of the conference and work on this is proceeding.

The technical content of the Conference will address the key issues identified in the regional workshops held in Cyprus, Singapore, Tanzania and Argentina (see R7.1 and R7.2 above). A tentative list of topics was included in the announcement. March 15, 2020 will be the deadline for submission of abstracts. A more detailed structure will be developed at the next meeting of the Programme Committee, at which time the submitted abstracts will be available for review and selection.

Argentina raised some concern regarding the topics of the Conference and mentioned that topics list does not address any of the eighteen lessons in Fukushima and therefore much more consultation is needed.

The Secretariat replied that the topics mentioned in the announcement are not limited and the announcement calls for the submission of abstracts on any relevant topic in radiation protection. The final conference programme will be drafted in June 2020, based on the abstracts that are received.

The Chairperson noted this remark and encouraged all RASSC members to promote the conference.

**R8  REPORTS OF MEETINGS**

**R8.1  BSS Workshops in Botswana: Report from the Secretariat**

Ms Olga German reported on a national workshop in Implementation of GSR Part 3 organized based on a request by the Government of Botswana.

The workshop in Gaborone, Botswana was held on 13-16 August 2019 and was attended by 36 participants representing various ministries, authorities, industry, service providers and medical establishments. The workshop addressed general requirements for radiation protection (justification, optimisation, dose limitation, regulatory system, roles and responsibilities), occupational exposure (requirements for monitoring, health surveillance), medical exposure (development of Diagnostic Reference Levels and dose planning) and radiation protection of the public in existing exposure situations (radon indoors, radionuclides in commodities), and application of radiation protection principles in emergencies. Botswana representatives provided four national presentations. The discussions revealed the need for further work on understanding the requirements in GSR Part 3 and closing gaps in the regulatory system. Agreements were reached on implementation priorities and some further work was initiated. In general, everyone welcomed the workshop and found it useful for improving radiation safety across all practices and other situations in the country.

ILO asked about any challenges in occupational radiation protection identified during the national BSS workshops. Ms German replied that dose limit to the lens of the eye and use of calendar year for dose limits were noted as challenging in Botswana, similar to any other country. Mr Pappinisseri added that
in many workshops the requirements for female workers during and after pregnancy and the requirement dealing with the exposure of air crew were noted as challenging for implementation. Mr Okyar further mentioned that Member States still face some challenges in internal dose evaluation, authorisation of technical service organisations (for example calibration services), establishment of national dose registries and managing exposure of itinerant workers.

R8.2 BSS Workshops in Saudi Arabia: Report from the Secretariat

Mr Haridasan Pappinisseri reported on a recent national workshop on GSR Part 3 organised in Riyadh, Saudi Arabia. The workshop, hosted by the Nuclear and Radiological Regulatory Commission (NRRC), was held on 1-5 September 2019 and attended by 63 participants representing various ministries, universities, hospitals, customs, defence departments, and industries (Schlumberger, Saudi Aramco). The following topics were covered in the workshop:

Introduction to International Basic Safety Standards; Changes from 1996 edition to 2014 edition of International Basic Safety Standards (GSR Part 3); occupational radiation protection; public exposure; naturally occurring radioactive material; non-medical human imaging; existing exposure situations (radon, food, drinking water and building materials); exemption and clearance, consumer products; arrangements for managing emergency exposures, Fukushima experience and medical uses of radiation (diagnostic radiology, nuclear medicine, radiotherapy; implications of changes to the dose limit for the lens of the eye).

NRRC is currently preparing to adopt GSR Part 3 into national regulations and the workshop was used as an opportunity to sensitize all interested parties and for dialogue between the regulator, qualified experts and various parties concerned. The workshop provided many explanations on the requirements to better understand the IAEA Safety Standards and noted some challenges in interpreting the translated versions in Arabic. A set of key recommendations on each topical area was conveyed to the Government and NRRC for follow-up actions.

France commented that, aircrew in France receives a mean dose in the range of 1–2 mSv per year and this needs to be taken into account when considering any regulatory action. Mr Pappinisseri replied that in the workshop in Saudi Arabia there was a request to provide guidance on radiation safety in civil aviation; this was also noted in few other national workshops. Currently, Agency’s guidance is available in the Safety Guide GSG-7 Occupational Radiation Protection for protection of air crew workers.

Argentina expressed the view that many times the language translation is not creating problems whereas the original English words in the Standards has its own associated translational issues.

Mr Peter Shaw asked, considering the location of the workshop, if there were any issues related to NORM (Naturally Occurring Radioactive Material), or are such industries already under a robust regulatory regime. Mr Pappinisseri agreed that the topic was challenging from the national perspective especially with respect to oil and gas industry and there were participants from these industries in the workshop. Better clarity in the requirements for radionuclides of natural origin were provided and regulators and operators were advised to apply a graded approach.

R8.3 NORM IX Conference: Report from the Secretariat

Mr Burcin Okyar reported the summary of the Ninth International Symposium on Natural Occurring Radioactive Material (NORM IX) held in Denver, Colorado on 23 to 27 September 2019. The symposium was organised by the CRCRD, in cooperation with the IAEA and supported by various organizations EPA, US NRC, NCRP, ICRP, UNSCEAR, WHO, ILO and IRPA. The purposes of the symposium included addressing generic approaches for exposure controls to NORM; evaluating practical application of Standards; discussing industry specific case studies; addressing issues related to residue management and transport as well as identifying societal needs.
There were 361 delegates from 48 countries in the symposium. A detailed rapporteur’s summary for 18 topical sessions has been prepared. The symposium concluded with the following observations:

- Continued desire for harmonisation in radon reference levels, dose conversion factors, regulatory limits;
- ICRP system of radiological protection (planned vs existing) applicable to NORM may be problematic, especially considering that socio-economic issues vary considerably between countries;
- Models and measurements need cautious approach in interpreting results and further related decisions;
- Radon exposure continues to be an issue especially in the wake of the new ICRP dose coefficients and UNSCEAR dose conversion factors and their implications;
- Management of residues containing NORM is still an issue in many countries. However, these are increasingly recognized as a resource. Recycling and reuse need further public acceptance;
- Greater involvement of IAEA, regulators and industries is needed in managing transport of NORM and avoid denial of shipments; and
- Noted many industry specific case studies.

All presentations of the symposium are available on the IAEA-ORPNET website. 
[https://nucleus.iaea.org/sites/orpnet/resources/SitePages/NORM%20IX.aspx](https://nucleus.iaea.org/sites/orpnet/resources/SitePages/NORM%20IX.aspx)

Mr Leo van Velzen from the Dutch Society for Radiation Protection informed RASSC that the next symposium in the series (NORM X) will be organized in Utrecht, the Netherlands in May/June 2022. This will be an important event after 25 years of nine successful NORM symposia that were initiated in the Netherlands in 1997.

Argentina asked if there was any presentation on UNSCEAR dose conversion factors in the symposium. Mr Okyar replied there wasn’t any. Further Argentina commented if there was any discussion about the labour court and legal issues with respect to workplace and related conventions and recommended brain storming with the help of ILO and workers representatives. The UNSCEAR representative clarified that the vice-Chair of UNSCEAR attended the symposium and presented the overall work of the UNSCEAR including some slides on radon. UNSCEAR was not requested to provide a focussed presentation on radon in the symposium.

IEC informed in the context of measurements that state of the art instruments are now available, with the capability to measure NORM especially in border monitoring. It was informed that a number of IEC standards were referred to in the symposium.

Argentina expressed concern over the denial of shipments involving NORM and reminded a past GC resolution to explore the possibility of a code of conduct to avoid denial of shipments.

Brazil commented that NORM is a significant regulatory problem, in particular management of residues and wastes. In addition, transport matters also face legal problems. Brazil urged RASSC to provide an effective and simple answers to solve these practical issues in Member States. Mr Okyar mentioned that the situation is slowly changing and GSR Part 3 requirements and related guidance in GSG-7 would assist in solving many of the issues raised.

Following this discussion, the Chairperson remarked that this is an area that RASSC will come back to in future meetings. In addition, Mr Pinak assured that the Secretariat will consider the relevant GC resolutions and will continue cooperation with the transport section in addressing practical issues and suggested RASSC to consider the topic in their future programmes.

R8.4 IAEA’s Modelling and Data for Radiological Impact Assessment (MODARIA) programme: Overview and future developments: Report from the Secretariat
Ms Joanne Brown presented a brief overview of the IAEA-MODARIA programme. Environmental assessment models are used to evaluate the radiological impact of releases of radionuclides to the environment from past and potential future practices and accidental releases. The models are essential tools for regulatory control of discharges to the environment and for radiological impact assessments, both for humans and non-human biota. The IAEA began supporting environmental assessment activities in the 1980s and series of programmes initiated (BIOMOV I & II, VAMP, BIOMASS, EMRAS I & II, MODARIA I & II).

MODARIA run in 2 phases: 2012–2015 and 2016–2019; with nearly 135 participants (universities, laboratories, technical support organizations, regulators, operators, consultancy services, governmental organizations and private companies) from 43 Member States. There are 7–10 Working Groups namely:

1. Assessment and Decision Making of Existing Exposure Situations for NORM and Nuclear Legacy Sites
2. Assessment of Exposures and Countermeasures in Urban Environments
3. Assessments and Control of Exposures to the Public and Biota for Planned Releases to the Environment
4. Transfer Processes and Data for Radiological Impact Assessment
5. Exposure and Effects to Biota
7. Assessment of Fate and Transport of Radionuclides Released in the Marine Environment

Detailed activities within each of the working groups were outlined in the presentation. A final Technical Meeting was held in October 2019 to review the working group activities and develop final reports as well as to discuss ideas for future programme. It was mentioned that the overall work will be important to IAEA and will provide guidance for Member States. The report will serve as a key reference source of modelling approaches and model comparisons to build confidence in results of assessments. A special issue of the Journal of Radiological Protection is planned for 2021.

In terms of future programmes, it is important to align with wider safety objectives of the IAEA, to consider cross-cutting topics and continue to respond to changing concerns of Member States. It is also important to provide a platform for experts to discuss and exchange information on radiological impact assessment. Programmes such as this also provide the opportunity for training activities on modelling tools/applications and encourage participation of those developing expertise in this field, particularly younger scientists.

IRPA expressed concerns on conservatism in every parameter in modelling and its multiplicative effects in the decision making and to what extent it is acceptable. Ms Brown agreed that this is an important and valid question and commented that it depends on the type of assessment such as screening assessment, site assessment or probabilistic assessment etc. In probabilistic assessments, a range of values is usually taken into consideration.

Argentina supported the concern raised by IRPA mentioning that in Chernobyl, the measured and modelled values were more than one order of magnitude difference, in Fukushima the factor is nearly 3 or 4. Models are always conservative, but the value arrived at is taken as real by decision makers. While agreeing to this view, Ms Brown added that models are always useful in particular in the post-emergency situation when there are few measurements and predictions into the future needed; also variability in human behaviour often is a large factor in determining doses.

France asked if any major changes are expected in the models used in the Safety Report Series 44 and in reply it was confirmed that no major changes are to be introduced in those models.

Japan enquired if MODARIA can be used as a benchmark for modelling different exposure situations. Ms Brown replied that it is a very useful platform for validation of models, comparison of models, testing various parameters used in models, and a library of case studies in predicting radionuclide concentrations in a particular situation is being compiled, etc.
IEC shared that three models (Hot spot, EPA model, NARAC model) have been in use for predicting the spread of a radioactive plume or contamination in the atmosphere. These models are widely used in the United States for release assessment.

South Africa commented that models code verification and validation is extremely important from a regulatory point of view. While preparing the final report or future programmes, practicality from a regulatory perspective may be considered and would be very useful for Member States. Ms Brown replied that RASSC secretariat will be consulted in deriving future programmes and suggest how RASSC members could contribute in the programme and its practical use.

Ms Bly thanked Ms Brown for her interesting presentation and closed the discussion.

8.5 Convention on Nuclear Safety: Report from the Secretariat

Mr Miroslav Svab reported on the preparations for the Eighth Review Meeting (RM) of the Convention on Nuclear Safety (CNS). The CNS is a legally binding instrument and was entered into force on 24 October 1996. There are 86 Contracting Parties to the Convention as of November 2019 and seven Signatory States that have not yet ratified the CNS. The Eighth Review Meeting of the CNS will be held during the period 23 March to 3 April 2020 with the Czech Republic (Ms Dana Drabova) as President, and Australia (Mr Carl-Magnus Larsson) and the Republic of Korea (Mr Kim Manwoong) as Vice Presidents. Mr Svab explained the new features of the 8th RM, e.g. invitation to WANO (World Association of Nuclear Operators) as an observer to the RM for the first time. He informed about the CNS officers training, CNS workshops and the CNS Brochures, the composition of the 8th RM country groups and time schedules of the CNS peer review process.

9 Experience in using NSS-OUI

9.1 Report from Singapore

The NSS-OUI platform is the standard system for providing feedback on safety standards. Member States were requested to use this platform for providing feedback and experiences. Singapore volunteered on the Secretariat’s request and Ms Elizabeth Wong presented the following review experiences:

- Noted easy to access to NSS-OUI from the Safety Series and Security Series web pages, but only if one already knows about it.
- It might be useful to include a line in the main text of the page to “advertise” NSS-OUI.
- Works well with desktops and tablet but not with smartphones.
- The self-learning tool on the welcome page is very useful.
- Easy to search and browse for publications using various means.
- Inconsistency in the display of the search results.
- Viewing e-version of publication pops up in a new tab / window, allowing user to continue search in original window and easy to navigate document is useful.
- Suggest including the section number as found in the publication in the table of contents (navigation panel on left).
- Definitions pop-ups and footnotes navigation are useful, however, there are still scope for improvement.
- The hyperlink circled in red brings the user to the publication page, instead of the e-version on NSS-OUI.
- Relevant publication references are useful.
- NSS-OUI meets its objective of providing users “an easy access to the content of the Series”.

Ms Bly thanked Ms Brown for her interesting presentation and closed the discussion.
Mr Delattre appreciated the feedback and mentioned that the Secretariat will take all possible steps to improve the online user interface, just as actions were taken on the previous feedback provided by Australia. Currently the new Safety Glossary (2018 edition) has been incorporated to provide definitions and continued tagging of safety requirements. Mr Delattre also expanded on some of the comments from Singapore and assured further improvements based on the observations. Additional efforts are ongoing to include the step-by-step process in developing Safety Standards.

Ms Bly made a survey among participants at the RASSC meeting to check if there is more experience on using the NSS-OUI and noted that many RASSC members use it. The Chairperson made an open call among members and observer organizations for similar presentations in future. Those interested were requested to inform the Secretariat.

**R10  REPORTS FROM INTERNATIONAL ORGANIZATIONS**

Written submissions were received from International Organizations in advance of the meeting and these were made available on the RASSC website. The Chairperson encouraged everyone to read the reports and inform themselves about the current activities and priorities in other International Organizations.

FAO summarized its work relevant to the roles and responsibilities of RASSC. FAO, IAEA and WHO are working in collaboration with a Steering Group of technical experts on a project to harmonize international guidance and criteria for radionuclides in food and drinking-water in non-emergency situations (existing exposure situations). It involves developing an approach to providing guidance on radionuclides in food and includes the consideration of both natural and human-made radionuclides. Detailed information on the work undertaken in harmonizing standards for radionuclides in food and drinking water was provided.

The ICRP updated the meeting on the summary of the radon dose coefficients. For inhaled radon-222 and progeny, a dose coefficient of 3 mSv per mJ h m\(^{-3}\) (approximately 10 mSv per WLM) is recommended for most circumstances of exposure in workplaces, equivalent to 6.7 nSv per Bq h m\(^{-3}\) using an equilibrium factor of 0.4. ICRP has further indicated that the same value will apply to exposures in homes. If circumstances of occupational exposure warrant more detailed consideration and reliable alternative data are available, site-specific doses can be assessed using methodology provided by ICRP. The International BSS reference levels of 300 Bq m\(^{-3}\) for homes and 1000 Bq m\(^{-3}\) for workplaces correspond to 14 mSv and 13 mSv per year, respectively, using this dose coefficient.

Reviews of available epidemiological and dosimetric data support the use of ICRP data as central rather than conservative values.

UNSCEAR summarized the Committee’s report presented to the UN General Assembly in October 2019 reflecting the discussions of UNSCEAR 66th Session. UNSCEAR approved two documents in this Session a) *Evaluations of selected health effects and the inference of risk due to radiation exposure*; and b) *Lung cancer from exposure to radon*. The UNSCEAR Secretariat has set up expert groups for two new projects endorsed by the Committee, that commenced work in the third quarter of 2019:

1) Second Primary Cancer after radiotherapy; and

2) Epidemiological studies of radiation and cancer.

The future programmes indicated two new expert working groups dealing with study on diseases of the circulatory system and exposure to ionizing radiation; and expert group on public exposure.

**R11  CLOSING OF THE MEETING**

**R11.1  Any Other Business**
NEA

The Secretariat informed the Committee that the NEA was contacted based on the comments from RASSC while approving the Safety Guide DS468 regarding the possibility of cosponsoring the draft safety guide DS468. NEA confirmed its policy of cosponsoring only safety requirements.

IRPA

Mr Roger Coat, IRPA representative informed the Committee that this will be his final RASSC meeting as IRPA President and a new President will be selected in the upcoming IRPA15 Congress. He drew attention on five key points that are summarized in the IRPA report on Committee web.

1) Looking to the future of the system of radiological protection and practicality IRPA points out reasonableness, conservatism and effective use of graded approach and urged to focus on high exposure levels rather than trivial doses.

2) Effective radiation safety culture.

3) Future of radiation safety profession – how to inspire youngsters.

4) Work about the task groups on dose limit to the lens of the eye and NORM in industry.

5) Public understanding and importance of public engagements.

IRPA mentioned on the upcoming International Congress (IRPA15) to be held in Seoul, May 2020. On a personal note Mr Coat expressed his appreciation and thanks to the RASSC and IAEA in engaging with IRPA and allowing it to freely express its views. The Chairperson thanked Mr Coat for his active involvement in RASSC and RASSC thanked Mr Coat with applause.

ARGENTINA

Mr Abel Gonzalez, representative of Argentina made a formal request to the Secretariat and RASSC on two projects to prepare international guidance on 1) Monitoring and recording of adventitious exposure in radiotherapy and 2) Regulatory control of radioactivity in consumer goods generally available public. Mr Gonzales cited that Argentina made a presentation on the two topics in November 2018 RASSC meeting, however, the request was not formally registered. These two topics are crucial in the current international and national scenarios and there exists several confusions among regulators and public at large, and therefore, Argentina calls for early action in developing appropriate guidance.

The Chairperson remarked that a previous discussion with RASSC Scientific Secretary Mr Colgan, tentatively agreed for a topical session in the next RASSC meeting on high exposure in medicine such as radiotherapy and related unintended exposure and second cancer issues and RASSC might be able to discuss the topic further. United Kingdom considered that as the next meeting is expected to be a joint session with WASSC it would be ideal if a topic of interest to both committees is selected for topical session.

Responding to the request, Mr Pinak stated that the documents developed under the practical arrangements with Argentina are already available on RASSC web. The Secretariat fully respects the request, and before entering into the programme and budget of the Agency’s work programme, Agency would like to seek the consensus opinion of RASSC and mentioned that precedence exists in developing newer guidance material as and when needed based on RASSC advice and proper justification.

Mr Gonzalez remarked that there is already a General Conference resolution on the issue of consumer goods. Mr Pappinisseri explained that ongoing work on the guidance for exemption and clearance and associated work in developing a safety report on trade of commodities will cover some of the issues related to consumer goods. Moreover, work is ongoing in harmonizing standards for radioactivity in food and drinking water, consistent with the GC resolution. However, the Secretariat is fully
committed for action to initiate further guidance on the suggested topic if there is a recommendation from RASSC.

Ms Bly concluded that RASSC will discuss further on this topic in the next meeting. To be more precise, Mr Pinak informed that Secretariat will prepare a proposal based on the request and supporting documents already available as prepared with the bilateral arrangements with Argentina and upload for RASSC comments before the next meeting and see the consensus judgement on the need for the two documents.

**Action:** The Secretariat to prepare a note on the need for international guidance related to adventitious exposure in radiotherapy and regulatory control of radioactivity in consumer goods based on the proposal from Argentina and invite RASSC members for comments.

Mr Stefan Mundigl, EC representative reported on a joint EC-IAEA seminar on lessons learnt in implementing both GSR Part 3 and EC- BSS Directive that was proposed at the recent Article 31 Committee meeting. Such a meeting would probably be held in Luxembourg in 2021. Mr Mundigl committed to providing more detail at a future RASSC meeting. Mr Pinak welcomed the proposal, indicating that it would be useful in improving future safety standards.

**R11.2 Dates of Future Meetings**

Mr Pappinisseri informed RASSC that the next meeting will be held on 22-24 June 2020 and will include a joint session with WASSC. The subsequent meeting has been planned during the week prior to the International Conference on radiation safety and scheduled on 4 to 6 November 2020.

**R11.3 Conclusions of the Meeting**

The Chairperson thanked all RASSC members and observers for their contribution to the discussion. She particularly thanked Ms Anki Hägg for chairing the Topical Session. Ms Bly also referred to the intensive discussion on radon dose conversion factors and ongoing work on exemption and clearance. Ms Bly hoped that the agreed topics will come for discussion in the next RASSC meeting. She thanked the Secretariat for its preparations and support of the meeting.

**R11.4 Closing**

The meeting was formally closed by Mr Pinak, who thanked Chairperson, RASSC members and observers and mentioned that RASSC is the driving force for the work of the Secretariat. Mr Pinak also appreciated the preparation of the Topical Session on Non-Medical Human Imaging and thanked all contributed speakers. He thanked Mr Haridasan Pappinisseri for acting as Scientific Secretary on short notice. He also appreciated the work of Ms Allison Gruber and thanked other staff involved from the Secretariat.

ENDS
Annex 1

List of Actions

Action: The Secretariat to forward the DPP for the draft safety guide Radiation Protection Programmes for the Transport of Radioactive Material (DS521) to the CSS for endorsement.

Action: The Secretariat to submit the draft safety guide: Remediation Strategy and Process for Areas Affected by Past Activities or Events (DS468) to the CSS for endorsement.

Action: The Secretariat to submit a note to the CSS clarifying how the Fundamental Safety Principle 7 is addressed in this Safety Guide (DS468).

Action: The Secretariat to submit the draft safety guide: Revision by amendment of 8 Specific Safety Guides for Research Reactors as a set of publications (NS-G-4.1 to NS-G-4.6, SSG-10 and SSG-37) (DS509) to the Member States for comment.

Action: The Secretariat to submit the draft safety guide: Criticality Safety in the Handling of Fissile Material (revision of SSG-27) (DS516) to the Member States for Comments.

Action: The Secretariat to bring the lack of appropriate exposure measurement quantities for criticality accidents to the attention of ICRU.

Action: Based on the discussion at RASSC, the Secretariat to publish a web article on dose conversion factors for radon.

Action: The Secretariat to discuss radon dose conversion factors in the Inter-Agency Committee for Radiation Safety (IACRS) and, subject to agreement, to issue a joint position statement.

Action: The Secretariat to prepare a note on the need for international guidance related to adventitious exposure in radiotherapy and regulatory control of radioactivity in consumer goods based on the proposal from Argentina and invite RASSC members for comments.
# Annex II

## AGENDA

47th Meeting of the Radiation Safety Standards Committee (RASSC)

20-22 November 2019

Boardroom M-3, M-Building

**Wednesday 20 November 2019 at 14:00**

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### R6. Topical Session: Non-Medical Human Imaging

**Chair: Anki Hägg, Sweden**

_Thursday 21 November 2019 14:00 – 17:30_

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<td>For information</td>
<td>B. Okyar/ L. van Velsen</td>
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<td>R8.4</td>
<td>IAEA’s Modelling and Data for Radiological Impact Assessment (MODARIA) programme: overview and future developments</td>
<td>For information</td>
<td>J. Brown</td>
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<td>R8.5</td>
<td>Status of preparation for the 8th review meeting of the CNS</td>
<td>For information</td>
<td>M. Svab</td>
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### R9. Experience in using NSS-OUI

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<thead>
<tr>
<th>R9.1</th>
<th>Report from Singapore</th>
<th>For information</th>
<th>E. Wong</th>
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<tr>
<td>R9.2</td>
<td>IAEA update on NSS-OUI</td>
<td>For information</td>
<td>D. Delattre</td>
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### R10. 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.

<table>
<thead>
<tr>
<th>R10.1</th>
<th>Food and Agriculture Organization of the United Nations (FAO)</th>
<th>C. Blackburn</th>
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<tr>
<td>R10.2</td>
<td>International Labour Organization (ILO)</td>
<td>S. Niu</td>
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<td>R10.3</td>
<td>Pan American Health Organization (PAHO)</td>
<td>P. Jimenez</td>
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<tr>
<td>R10.4</td>
<td>United Nations Environment Program (UNEP)</td>
<td>F. Shannoun</td>
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<td>R10.5</td>
<td>United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)</td>
<td>F. Shannoun</td>
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<tr>
<td>R10.6</td>
<td>World Health Organization (WHO)</td>
<td>M. Perez</td>
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<tr>
<td>R10.7</td>
<td>European Commission (EC)</td>
<td>S. Mundigl</td>
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</tbody>
</table>
R10.8 Nuclear Energy Agency / Organization for Economic Co-operation and Development (NEA/OECD)  
Y. Hah
R10.9 European Nuclear Installation Safety Standards Initiative (ENISS)  
B. Lorenz
R10.10 Heads of the European Radiological Protection Competent Authorities (HERCA)  
K. Petrova
R10.11 International Commission on Radiological Protection (ICRP)  
C. Clement
R10.12 International Radiation Protection Association (IRPA)  
R. Coates
R10.13 International Source Suppliers and Producers Association (ISSPA)  
R. Wassenaar
R10.14 International Standards Organization (ISO)  
J-F. Bottollier
R10.15 World Nuclear Association (WNA)  
C. Sanders
R10.16 International Electrotechnical Commission (IEC)  
R. Radev

R11. Closing of the Meeting

R11.1 Any other business  
R. Bly
R11.2 Dates of Future Meetings  
H. Pappinisseri
R11.3 Conclusions of the Meeting  
R. Bly
R11.4 Closing  
M. Pinak

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<td><strong>RASSC 49</strong></td>
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# Annex III
## List of Participants

### Radiation Safety Standards Committee (RASSC)

| Country                  | Participant Name                      | Alternate
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Argentina</td>
<td>Mr Abel Julio Gonzalez</td>
<td>(Alternate)</td>
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<tr>
<td>Australia</td>
<td>Mr Alex Kalaiziovski</td>
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<tr>
<td>Austria</td>
<td>Mr Helmut Fischer</td>
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<tr>
<td></td>
<td>Mr Ernst Rudolf</td>
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<tr>
<td>Brazil</td>
<td>Mr Ricardo Gutterres</td>
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<tr>
<td>China</td>
<td>Mr Liye Liu</td>
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<td></td>
<td>Mr Faguo Chen</td>
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<tr>
<td>Czech Republic</td>
<td>Ms Marcela Bercikova</td>
<td>(Alternate)</td>
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<tr>
<td>Denmark</td>
<td>Mr Haraldur Hannesson</td>
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<tr>
<td>Egypt</td>
<td>Mr Abdellah Waleed</td>
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<tr>
<td>Finland</td>
<td>Ms Ritva Bly</td>
<td>CHAIR</td>
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<tr>
<td>France</td>
<td>Mr Jean-Luc Godet</td>
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<td></td>
<td>Mr Yann Billarand</td>
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<tr>
<td></td>
<td>Ms Siham Van Ryckeghem</td>
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<tr>
<td>Germany</td>
<td>Ms Annemarie Schmitt-Hannig</td>
<td>(Alternate)</td>
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<td></td>
<td>Ms Annegret Guenther</td>
<td>(Alternate)</td>
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<tr>
<td>Hungary</td>
<td>Mr Sandor Kapitany</td>
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<tr>
<td>Iceland</td>
<td>Mr sigurdur Magnusson</td>
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<tr>
<td>Iran</td>
<td>Mr Abbas Rahimi Khoshmakani</td>
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<tr>
<td>Ireland</td>
<td>Mr David Fenton</td>
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<td></td>
<td>Mr John Hynes</td>
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<tr>
<td>Israel</td>
<td>Mr Jean Koch</td>
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<tr>
<td>Italy</td>
<td>Mr Luciano Bologna</td>
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<tr>
<td>Japan</td>
<td>Mr Kazuki Iwaoka</td>
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<tr>
<td></td>
<td>Mr Haruyuki Ogino</td>
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<tr>
<td></td>
<td>Mr Hirokazu Tachikawa</td>
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<tr>
<td>Korea, Republic of</td>
<td>Mr Je-Keun Chon</td>
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<td></td>
<td>Mr Min-Chul Song</td>
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<td></td>
<td>Mr Myung Sub Song</td>
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<td>Netherlands</td>
<td>Ms Miriam Tijsmans-Graber</td>
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<td>Mr Leonardus van Velzen</td>
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<td>Norway</td>
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<td>Ms Louisa Mpete</td>
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<td>Ms Carmen Álvarez García</td>
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<td>Switzerland</td>
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