

OPEN SUMMARY

2018 Meeting of Senior Representatives of Organisations in Formal Relations with ICRP

16 October 2018

08:30 - 16:30

Sheraton Hotel, Stockholm, Sweden

Present

International Commission on Radiological Protection (ICRP): **Claire Cousins** (Chair), **Jacques Lochard** (Vice-Chair), **Christopher Clement** (Scientific Secretary), **Kimberly Applegate** (C3 Chair), **Simon Bouffler**, **Kun-Woo Cho**, **Donald Cool** (C4 Chair), **John Harrison** (C2 Chair), **Michiaki Kai**, **Dominique Laurier**, **Sergey Romanov**, **Werner Rühm** (C1 Chair), **Christian Streffer** (Main Commission member emeritus), **Hiroki Fujita** (Assistant Scientific Secretary), **Chunsheng Li** (Assistant Scientific Secretary), **Lynn Lemaire** (Executive Administrator), **Kelsey Cloutier** (Development and Communications Manager), **Isao Kawaguchi** (Intern)

Conference of Radiation Control Program Directors (CRCPD): **David Allard**

European Alliance for Medical Radiation Protection Research (EURAMED) & International Society of Radiology (ISR): **Guy Frija**

European Nuclear Installations Safety Standards Initiative (ENISS): **Bernd Lorenz**

European Platform on Preparedness for Nuclear and Radiological Emergency Response and Recovery (NERIS): **Thierry Schneider**

European Radiation Dosimetry Group (EURADOS): **Werner Rühm**

European Radioecology Alliance (ALLIANCE): **Hildegarde Vandenhove**

Heads of the European Radiological Protection Competent Authorities (HERCA): **Karla Petrova**

Ibero American Forum of Radiological and Nuclear Regulatory Organisations (FORO): **Marcela Ermacora**

International Atomic Energy Agency (IAEA): **Miroslav Pinak**

International Radiation Protection Association (IRPA): **Roger Coates**

Multidisciplinary European Low Dose Initiative (MELODI): **Simon Bouffler**



National Council on Radiation Protection and Measurements (NCRP): **Kathy Held**

OECD Nuclear Energy Agency (NEA): **Ted Lazo**

United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR): **Ferid Shannoun**

World Health Organisation (WHO): **Maria del Rosario Perez**

World Nuclear Association (WNA): **Willie Harris**

Rapporteur: **Jean-Francois Lecomte**

Regrets

European ALARA Network (EAN)

European Commission (EC)

IEC Electrical Equipment in Medical Practice (IEC/TC62)

IEC Nuclear Instrumentation (IEC/TC45)

IndustriAll Global Union's International Network (INWUN)

Information System on Occupational Exposure (ISOE)

International Commission on Radiation Units and Measurements (ICRU)

International Labour Organisation (ILO)

International Organization for Medical Physics (IOMP)

Meeting Summary

ICRP Chair Claire Cousins welcomed all present and invited all participants to introduce themselves.

ICRP Vice-Chair Jacques Lochard described the structure of the meeting.

The ICRP Main Commission has begun exploring areas of the system of radiological protection that might need further consideration. This is a precursor to deciding on priorities in preparation for a full review of the system of radiological protection, and the possibility of beginning an effort to develop a new set of fundamental recommendations. Similar efforts leading up to ICRP *Publication 103* took about a decade.

A preliminary list of areas to consider had been circulated in advance, meant only as a starting point for discussion:

Effects

- Definition of health
- Classification of effects
- Low-dose and low-dose rate risk
- Individual response to radiation
- Detriment beyond cancer and hereditary

Concepts

- Individual dose limitation
- Economic and societal factors in optimisation
- What is protected in protection of the environment
- Tolerability and reasonableness

Organising Radiological Protection

- Categories of exposure especially environment
- Relationships between exposure situations
- Exposure situations and protection tools (limits, reference levels, etc.)

Other

- Science, ethics, and judgement
- Protection of children
- Protection quantities

Each organisation was invited to make a brief presentation on what they view as the key areas of the system of radiological protection that might need further consideration.

After the lunch break, a structured dialogue was undertaken. Each liaison organisation representative spoke briefly and directly to the issue at hand without interruption. In a second round, they each spoke again reflecting on what was heard in the first round.

Comments related to the question at hand, loosely organised by the broad areas above recognising that there is considerable overlap, included:

Effects

- The WHO definition of health is “a complete state of physical, mental and social well-being, and not merely the absence of disease or infirmity”.

- Radiotherapy patients represent a cohort who have received radiation exposure, even at low doses, in healthy tissues that may be useful for research purposes.
- How to address the differences between chronic and acute exposures?
- It is premature to include cardiovascular disease in detriment.
- There is need to monitor evidence on radiation-induced central nervous system effects.
- How to consider chronic lifetime low dose rate exposures, with respect to knowledge gaps, and the translation of that knowledge into a practical system of protection?
- Investigate biomarkers of radiosensitivity.
- How to present uncertainty of risk estimates at low doses?
- How to consider dose, dose distribution, and dose-rate dependence of cancer effects?
- Perfect answers are not always needed for practical radiological protection.
- Understand what causes intra- and inter-species differences in radiosensitivity.
- Identify mechanisms of multigenerational responses to long-term ecologically relevant exposures.
- Further work is needed to study biological and ecological effects on biota.
- Understand the impact of multiple stressors on radiological protection of the environment.
- How to address probability of causation?
- ICRP needs to have sound evidence before including new effects in detriment.
- Human health must remain a main driver in radiological protection of people.
- The implication of hereditary effects should be revisited, and results communicated clearly.
- How to address the possibility of risks of background radiation, rather than focusing only on doses above background?

Concepts

- How to address questions on LNT?
- How to consider benefit (beneficence), the obligation to do no harm (non-maleficence), and prudence to ensure more than just net benefit?
- How to address individual radiological protection vs. population RP?
- How to address reasonableness in ALARA?
- Use of natural background exposure as context.
- Consideration of differences in “emergency ethics” and “normal ethics” to develop recommendations for evacuation and other post-accident management.
- Should Sv continue to be used for effective and equivalent dose?
- What is ICRP’s role in developing radiological protection culture?

- Further reflection on tolerability and reasonableness would be welcome.
- Consider using the words 'safe levels'.
- Further advice on optimisation of collective radiation exposure would be welcome.
- Further advice on justification would be welcome.
- Further advice on 'when is enough enough?' would be welcome.
- Further advice on transition out of an emergency would be welcome.
- A careful review of quantities is needed with respect to clarity and benefit.
- The use of ALARA needs clarification as it is currently ambiguous.
- Doses should be specified below which further optimisation is deemed unnecessary.
- Develop appropriate dosimetric models for protection of the environment.
- Dosimetric quantities for protection in medicine must be sound and consistent for the next set of recommendations.
- Further emphasis on optimisation of protection as a central theme would be welcome.
- The set of numerical criteria in the system must be easily understood and properly used.
- The rationale behind the numerical values of limits needs to be clarified.

Organising Radiological Protection

- Simplification of the system of radiological protection is needed.
- The system of radiological protection should be more understandable.
- There is a conflict between simplification of the system and taking into account many new factors such as protection of children. Clarification through improved communication of the system may be the way forward.
- There are limits to simplification of the system, which must take into account complex circumstances. There may be room for some simplification, but perhaps the emphasis should be more on clarification, i.e. the way the system is presented.
- Translation of the system of protection into standards and legislation would be improved with an easier to understand system.
- The system combining categories of exposure, exposure situations, and principles is complex when considering health through the course of life.
- The current system of protection works very well, and there does not appear to be a need to make any changes at the moment.
- We should go back to ICRP 26.
- WHO faces challenges implementing radiological protection in several areas: existing exposures including radon, food & drinking water; past accidents/conflicts; radiological and nuclear emergencies; and planned exposures e.g. medical use and occupational exposures.

- Dialogue with other areas including non-ionising radiation, chemical safety, communications, and behavioural and other social sciences would be helpful.
- There is a need for further development on reference levels in different situations.
- How to manage natural sources vs artificial?
- How to address challenges in countermeasure strategies in emergency & recovery?
- Improve human and the environmental protection through radioecology.
- International agreement on accepted protection values is needed for protection of the environment.
- It is worth considering the applicability of the various protection tools within the framework of the exposure situations and categories.
- Further advice is needed on caregivers and volunteers in biomedical research.
- Refocus the system to empower 'consumers' of protection including the public, patients, and workers.

Other

- Do not rush to new recommendations, as implementation of ICRP *Publication 103* is even now still underway. There does not seem to be a gap significant enough to justify an imminent change to the system. Stability is important. Produce recommendations when the time is right.
- Prior to developing new recommendations, focus on difficulties in interpretation and implementation of radiological protection, rather than on changing the system itself.
- Frequent changes in the system does not build trust in the system.
- How to take decisions at 'a few mSv/a and lower' when 'if there is a risk, it is very small'?
- Most decisions in radiological protection do not materially impact the total dose received by individuals of 'a few mSv/a'.
- What is ICRP's role in relation to over-conservatism in the practice of radiological protection?
- How to address affordability and sustainability of radiological protection?
- Modern advice on protection of the patient in radiotherapy, particularly paediatric, would be welcome.
- Revisit DRLs in relation to clinical indications.
- Keys to reducing dose to the public are radon and medical imaging.
- How to address asymptomatic people undergoing medical screening?
- Transfer of concepts of radiological protection to medical practice is weak.
- How to address protection of children and the unborn, including reassurance that the system provides adequate protection?

- Collaboration on communications would be useful.
- To what extent should ICRP be involved in communication and public understanding of radiation risk?
- ICRP needs to be aware of the consequences of the recommendations.
- New recommendations must consider the ability to implement recommendations, and benefit vs cost of implementation to ensure net benefit.

Jean-Francois Lecomte presented a summary, focusing on the structured dialogue in the afternoon, as a springboard for the general discussion that followed.

Cousins closed the meeting with a suggestion to revisit a short list of the most important issues at the next meeting of senior representatives of organisations in formal relations with ICRP.

What ICRP Heard

Ideas raised at the meeting were very useful as all of us explore areas of the system of radiological protection that might need further consideration. Without trying to reflect the wide range of issues raised, ICRP heard the following key points:

- The current system of radiological protection works well. There is value in stability of the system, and no compelling reason for significant, immediate change to the fundamental recommendations.
- Some simplification in the system of radiological protection may be beneficial, but it must remain robust enough to cope with complex situations. Nonetheless, there is room for clarification, and significant advantages in having a system that is more understandable. The audience must go beyond other international organisations and regulators to focus on ‘consumers’ of protection, including patients, workers, and the public.
- Over-conservatism, especially related to low doses, is an issue. ICRP needs to examine its role in responding to this. The wider radiological protection community should also address the level of conservatism applied in practice in developing standards and legislation, and in practice.
- The science underpinning the system of radiological protection is robust. However, continuing advances in science, especially in the areas of effects other than cancer,

low dose and dose rate exposure, protection of the environment, and individual response, must be supported and considered in the future development of the system.



Participants, left to right: B. Lorenz, G. Frija, J. Harrison, S. Romanov, J-F. Lecomte, K. Petrova, T. Schnieder, H. Vandenhove, T. Lazo, K. Prior, W. Harris, D. Cool, K. Applegate, M. Perez, C. Clement, C. Cousins, D. Laurier, R. Coates, M. Ermacora, D. Allard, W. Rühm, S. Bouffler, J. Lochard, K. Cho, F. Shannoun, M. Kai.