Background

The purpose of this WG was to consider the implications of the UNSCEAR report on Attributing Health Effects to Ionizing Radiation Exposure and Inferring Risks for the development of IAEA safety standards and to prepare a progress report for the 42nd meeting of the Commission on Safety Standards (CSS). The WG discussed the views on the implications of the report that were submitted in advance of the meeting and also discussed the Secretariat’s independent assessment. There was broad agreement among all constituents that there was a need for the safety standards to adequately reflect the concepts of attributability, inference of risk and use of collective dose, to reflect the lessons learned from the latest international scientific evaluations, and to ensure that these concepts are adequately addressed. The WG noted that the Strategies and Processes for the Establishment of Safety Standards (SPESS A) addresses interactions with other international organizations and states that “The findings of United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and the recommendations of international expert bodies, notably the International Commission on Radiological Protection (ICRP) are taken into account in developing the IAEA safety standards.” The WG also noted that the IAEA Safety Fundamentals had been issued in 2006, before the most recent recommendations of the ICRP.

Discussion

The WG agreed that the concepts of attributing health effects to ionizing radiation exposure and inferring risks are complex. While necessary to communicate, they may be difficult to translate into clear and unambiguous language. The WG noted challenges in communication of benefits and risks, in particular with communications of risks associated with events and emergencies (e.g., Goiania, Chernobyl, Fukushima). The WG also discussed the issues of communicating radiation risks in, for example, medicine, disposal of waste including spent fuel and remediation. While the core concepts are the same, the audiences are different. A prerequisite for good communication is that the experts and scientific community have a firm and shared understanding of core concepts of attributability of effects and inferring risks.

It is important that the IAEA be the leader in translating these concepts into the safety standards for the benefit of Member States, decision makers, the public and the media. While noting that radiation risk is not the only deciding factor in decision-making, and that economic and societal factors also need to be taken into account, it is important that IAEA make an authoritative statement on the applicability and use of these scientific concepts.

The intent of the WG’s recommendations is to strengthen the safety standards and to ensure that they are coherent, useful and current. The WG noted that the concepts set out in the UNSCEAR report do not represent a paradigm shift, but have been clarified and put into context, including analysis of uncertainties associated with assumptions and data, and the information value and hence usefulness of inferences for proper communication and decision making. The concepts dealt with in the UNSCEAR 2012 Report have already been captured in some existing Safety Guides (e.g., GSG-2 (2011) for operational intervention levels), and are reflected in others currently being finalized (e.g.,
DS474 and DS475). In other areas, these concepts have yet to be addressed (e.g., long term safety of waste disposal).

The WG agreed that concepts such as attributability, inference of risk and use of collective dose need to be consistently captured in the IAEA Safety Standards and other safety related publications. These concepts could impact topical areas, including but not limited to:

- Justification
- Optimization
- Graded approach
- Low doses and associated uncertainties
- The LNT assumption and its use in the safety standards
- The dose limitation system, the associated terminology and its use in the safety standards.

The WG noted that incorporating this recently highlighted information could be considered part of continuous improvement as required by GSR Part 2.

The WG discussed and agreed that there is a need for vigilance to ensure that all the Safety Standards are coherent and consistent with respect to core scientific concepts for decision-making and communication, e.g., attributability and related concepts. This would further inform the following areas in the communication activities of the Agency and its Member States:

- Inferable radiation risks and putting risks into perspective, for different situations
- Risks vs. benefits
- Attributability of radiation health effects
- “What is safe?” and “Am I safe?” (as recommended in the reports of several IAEA International Experts’ Meetings).

**Recommendations**

1. The WG recommends that a Consultancy be called to initiate an analysis of the Safety Fundamentals and to identify whether there is a need to refine certain parts of the text with respect to:

   - Retrospective attribution of radiation health effects to past radiation exposures
   - Prospective inference of health risks from radiation exposures
   - Prediction of notional health effects for comparative purposes (e.g., use of collective dose)

   The results of this Consultancy’s analysis should be provided to the 43rd CSS in April 2018 for deliberation and decision on a path forward. The results should be captured in a manner that would provide the background information for any proposed modifications to the Safety Fundamentals and/or any other safety-related publications, to support the Secretariat in, for example, the development of a draft Document Preparation Profile (DPP).

2. The WG further recommends that the CSS request the Safety Standard Committees (SSC) to determine which safety standards currently under development and already published could be strengthened in this respect and for the SSC Chairs to report on progress to the CSS meetings in 2018. This is not intended to be an extensive exercise.