1. IDENTIFICATION

Document Category or set of publications to be revised in a concomitant manner

Safety Reports Series

Working ID: N/A

Proposed Title: Application of the concepts of attribution of health effects and inference of risk

Proposed Action: new document

Review Committee(s) or Group: N/A

Technical Officer(s): Katherine Asfaw and Dominique Delattre

2. BACKGROUND

In 2015, the UNSCEAR 2012 Report to the General Assembly, with a Scientific Annex on attributing health effects to radiation exposure and inferring risks (A/67/46), was published. The UNSCEAR 2012 report raised questions about understanding among experts and communication with the public regarding issues such as radiation exposure, health effects and future risks, and set out in clear language the concepts of retrospective attribution of radiation health effects to past radiation exposures and prospective inference of health risks from radiation exposures.

In its response to the UNSCEAR 2012 report, the Commission on Safety Standards (CSS) first discussed the issues arising from the report at its 35th meeting in April 2014. Over subsequent meetings, the CSS initiated several actions, as follows:

(a) The CSS requested the Radiation Safety Standards Committee (RASSC) to prepare a policy paper. This paper was presented to the 39th CSS meeting in April 2016 and concluded that, while there was no direct and immediate implication for the safety standards, there was a need to better communicate with the public with respect to the UNSCEAR 2012 concepts.

(b) The CSS prepared a discussion paper of its own, which was presented at the 40th CSS meeting in November 2016, and established a working group to examine the implications of the UNSCEAR 2012 report for the safety standards. The CSS working group met in October 2017 and recommended that:

(i) An analysis of the Safety Fundamentals (IAEA Safety Standards Series No. SF-1) be initiated to identify whether there was a need to refine certain parts of the text with respect to the UNSCEAR 2012 concepts;
(ii) The Safety Standards Committees (SSCs) examine the safety standards (published and in draft) to determine which could be strengthened with respect to the UNSCEAR 2012 concepts.¹

(c) A Consultancy Meeting then took place from 14-16 February 2018 to analyse the Safety Fundamentals. That Consultancy Meeting recommended - and the CSS supported the recommendations at its 43rd meeting - that:

(i) A Safety Report be prepared to provide practical guidance, including case studies, on how to apply the UNSCEAR 2012 concepts;

(ii) The Safety Fundamentals be reviewed.²

(d) Another Consultancy Meeting took place from 5-8 March 2019 to prepare a detailed draft DPP to support development of the Safety Report. At the Consultancy Meeting an ‘annotated draft DPP’ was developed and agreed and several recommendations were set out, which the CSS endorsed at its 45th meeting in April 2019. In particular, the March 2019 Consultancy Meeting recommended that:

(i) The ‘annotated draft DPP’ be provided to drafters of the Safety Report;

(ii) A DPP (this DPP) be prepared, for approval in accordance with normal procedures;

(iii) Progress reports on the development of the Safety Report be provided to the SSCs and the CSS;

(iv) Consideration be given to preparing an internal document for the Secretariat to guide the future development of Safety Standards with respect to attribution of health effects and inference of risk.

The Chair’s report from the March 2019 Consultancy Meeting, which includes the recommendations and the ‘annotated draft DPP’, is provided on the CSS website.³

3. JUSTIFICATION FOR THE PRODUCTION OF THE DOCUMENT
The IAEA safety standards are intended to be used in a prospective manner, providing requirements and recommendations with the objective of protecting people and the environment from harmful effects of ionizing radiation. The standards are not intended to be used for the purposes of retrospective attribution of health effects. However, in distinguishing between these two approaches problems have arisen in understanding and communication, even among experts. This Safety Report is needed to provide clarification of the application of the standards in this respect.

In addition, the CSS has requested that this Safety Report be developed (see ‘background’).

4. OBJECTIVE
The objective of this Safety Report is to provide practical guidance on the application of the concepts

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¹ These reviews took place and reports are available on the Review Committees’ websites https://www-ns.iaea.org/committees/default.asp. In addition, a Consultancy Meeting took place in April 2018 to consider the implications of the UNSCEAR 2012 report for draft Safety Guide DS475, and this resulted in changes to DS475. DS468, also in development, was also modified with respect to recommendations relating to the UNSCEAR 2012 concepts.

² This review took place and reports from the SSCs and an executive summary are available on the CSS website https://www-ns.iaea.org/committees/csscomments/default.asp?fd=1916&dt=. It was concluded that there is no justification for an immediate revision of the Safety Fundamentals.

³ See https://www-ns.iaea.org/committees/csscomments/default.asp?fd=1706&dt=
of attributability of health effects and inference of risks, as set out in the UNSCEAR 2012 report, with regard to the facilities and activities covered by the IAEA safety standards.

A clear distinction will be made between circumstances for which health effects can be unequivocally attributed (individually or collectively) and those for which only notional health effects might be inferred. The Safety Report will be based on the scientific arguments in the UNSCEAR 2012 report and will focus on their practical application.

The Safety Report will discuss how the concepts of attribution and inference have a bearing on the communication of radiation risks. This will encourage the target audience (see below) to consider how they can achieve more clarity with regard to communicating radiation risks in different circumstances.

The Safety Report will help in putting risks into perspective against the benefits of the use of radiation.

The target audience of this Safety Report is experts on safety and radiation protection in regulatory bodies, other relevant authorities, operating organizations, TSOs and international organizations. The Safety Report is also expected to be of wider interest among the scientific community.

5. SCOPE
The scope of the Safety Report will be the same as that of the safety standards, i.e. it will cover all circumstances that give rise to radiation risks and will be applicable for the entire lifetime of all facilities and activities — existing and new — utilized for peaceful purposes, and protective actions to reduce radiation risks.

The Safety Report will not duplicate other publications; in particular it will not duplicate the content of the UNSCEAR 2012 report.

6. PLACE IN THE OVERALL STRUCTURE OF THE RELEVANT SERIES AND INTERFACES WITH EXISTING AND/OR PLANNED PUBLICATIONS
Because of its scope, the Safety Report will be linked to all safety standards. Consequently, all Sections in NS will be consulted during its development.

The Secretariats of ICRP and UNSCEAR will be invited to be involved in the drafting and review of the Safety Report. Possible co-sponsorship of the Safety Report by UNEP will be discussed with the UNSCEAR Secretariat.

In accordance with the recommendation of the March 2019 Consultancy Meeting, progress reports on the development of the Safety Report will be provided to the SSCs and the CSS.

7. OVERVIEW
A draft table of contents is set out below.

1. INTRODUCTION
   1.1. Background
   1.2. Objective
   1.3. Scope
   1.4. Structure

2. BASIS OF THE SAFETY STANDARDS
   2.1. Application of attribution and inference in relation to justification
   2.2. Application of attribution and inference in relation to optimization of protection
   2.3. Application of attribution and inference in relation to individual dose restrictions
   2.3. Provision of information about risk

3. RISK-RELATED CONCEPTS
   3.1. Health effects of radiation
3.2. Radiation risks
3.3. The dose-risk relationship
3.4. Attribution of effects
3.5. Inference of risk
3.6. Considerations on exposure: retrospective and prospective, background
3.7. Uncertainties and certainties, variabilities, sensitivities

4. PRACTICAL APPLICATION OF RISK-RELATED CONCEPTS FOR DIFFERENT CIRCUMSTANCES

5. THE IMPLICATIONS OF THE CONCEPTS OF ATTRIBUTION OF HEALTH EFFECTS AND INFERENCE OF RISK FOR COMMUNICATION

APPENDIX: A plain language explanation of the concepts of attribution and inference to support public communication and in particular media outreach

ANNEXES: Case studies on application of the concepts of attribution and inference in practice

8. PRODUCTION SCHEDULE: Provisional schedule for preparation of the document, outlining realistic expected dates for each step (fill the column corresponding to your proposed document and delete the other columns):

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<th>STEP 1: Preparing a DPP</th>
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  - Column A for Safety Fundamentals, Safety Requirements and Safety Guides.  
  - Column B for Nuclear Security Series publications  
  - Column C for TECDOCs, safety reports and other publications

9. RESOURCES

It is estimated that the development of the Safety Report will need several home-based assignments to develop the content and one Consultancy Meeting to review and refine the text.