

Application of Simplifying Assumptions and a Graded Approach in Prospective Screening of Radiological Doses for Planned Exposure Situations: Status on the Revision of IAEA SRS 19

T.L. Yankovich¹, G. Proehl¹, V. Berkovskyy² *et al.*

¹IAEA, Vienna; ²Ukrainian Radiation Protection Institute, Ukraine

Abstract

An Environmental Impact Assessment (EIA) is a procedure that identifies, describes, evaluates, and develops means of mitigating potential impacts of a proposed activity on the environment (UNEP, 2008). For example, when evaluating the potential for significant impacts related to the siting and operation of a radiological facility, or the planning and implementation of a related activity, it is often necessary to conduct prospective modelling to predict potential impacts, so that work can be planned and executed to ensure there is no significant net detriment to people or the environment. In doing so, there is a need to assess the potential magnitude of impacts, and based on this assessment, to plan the work such that the level of effort and mitigation is commensurate with risk.

This can be accomplished through the establishment of a multi-tiered or graded assessment approach, with increasingly more realistic (and less conservative) assumptions, and a correspondingly higher level of model complexity and/or site-specific characterization at higher assessment tiers. Implicit in this is the need to determine what level of conservative should be applied in simplifying assumptions, how much site-specific data may be required (for example, to characterize site-specific conditions and/or to validate model predictions), and which parameters should be measured at what frequency to ensure protection. Such questions require careful consideration during the development of safety standards that provide recommendations on defensible approaches for prospective risk assessment. For example, the International Atomic Energy Agency (IAEA)'s Safety Report Series 19 (SRS 19) provides generic models for use in assessing the impact of discharges of radioactive substances (IAEA, 2001), and is currently under revision.

The revised SRS 19 is intended to provide a self-contained manual containing a set of simple, yet robust assessment methodologies that may be applied at the planning and design stages of a facility or activity. The scope of the revised SRS 19 covers prospective screening assessment of doses to the representative person and Reference Animals and Plants (RAPs), applying a graded approach. Tabulated screening coefficients and environmental dilution factors are being included for 825 radionuclides, assuming equilibrium conditions, for use in the assessment radiological impacts arising from routine discharges of radionuclides to terrestrial and aquatic receptors for planned exposure situations. In addition, updated parameter values have been compiled from databases that were developed as part of the IAEA's EMRAS (Environmental Modelling for Radiation Safety) and EMRAS II international model validation programmes.

The presentation will provide: (i) an overview of the status of the documents; (ii) the underlying bases for assumptions; and (iii) levels of model complexity for different categories of nuclear facilities with varying expected impacts; and will highlight areas where further data could be beneficial.

Acknowledgement

This presentation is being made on behalf of numerous contributors and reviewers of the *Revised SRS 19* - K.M. Thiessen, Y. Bonchuk, A.I. Apostoaei, N. Beresford, J. Brown, M. Chartier, S. Fesenko, F.O. Hoffman, B.J. Howard, J.C. Mora Cañadas, H. Müller, H. Phillips, C. Robinson, J.G. Smith, M. Steiner, B.A. Thomas, and J. Van Der Wolf and the participants in IAEA programmes, such as EMRAS, EMRAS II, and MODARIA, who have contributed to the body of knowledge upon which the *Revised SRS 19* is based.