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The IAEA Methodology for Radiological Protection of the Environment, Including Human and Non-Human Biota

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In 2005 the IAEA started to work with international organizations and Member States towards enhancing international standards and guidance for the control of radiological impacts to people and the environment. Until then, protection of the environment was based on the assumption that compliance with standards for human protection would ensure that other species are not put at risk; this assumption was being challenged by the international community. IAEA standards considering a new perspective were started in 2006 with the Fundamental Safety Principles and continued with the IAEA Basic Safety Standards on Radiation Protection and the Safety of Radiation Sources. In these standards, the radiation protection objectives for non-human species were related to higher organization levels as populations, communities and ecosystems, rather than on the protection of individuals as it is the case for humans; the need to consider protection of humans and other species in an integrated manner was also recognized. The IAEA followed the 2007 recommendations of the ICRP on protection of the environment, and proposed an assessment methodology for flora and fauna similar to that applied for demonstrating compliance of doses to humans with predefined criteria. The method entails the use of a set of reference animals and plants (RAPs) that relates to various species and ecosystems. Radiation exposure levels can be estimated and compared to criteria identified, below which no or only very limited adverse effects to biota are expected. The integration of the protection of humans and other species was approached by assuming the linkage of the exposure scenarios between humans and flora and fauna. This resulted in a practical methodology which can be implemented with basically the same resources as those used to demonstrate protection of humans; the effectiveness of the approach to protect flora and fauna is verifiable by environmental monitoring programmes similar to those already in place for the humans exposures pathways, considering the relevant media. The IAEA established different ways to consider protection of biota for different exposure situations. For planned exposure situations, the results of the estimation of exposures to RAPs are compared to reference levels, and this could imply the need of control of the source. For existing and emergency situations, the control of those exposures is limited or impossible and the results of the assessments should be considered as an aspect in the optimization process, together with others, like social and economic factors. The paper presents the methodology developed by the IAEA and its implementation in international legal instruments, like in the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, and in recently prepared IAEA Safety Guides.

Country/Organization invited to participate

International Atomic Energy Agency

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