

Input to 2016 SG report on oceans and the law of the sea (RES 70/235)

Second part

Executive Summary

The International Atomic Energy Agency (IAEA) provides, inter alia, support to its Member States to develop and improve relevant nuclear and isotope-based tools and techniques to monitor and support efforts to protect the coastal and marine environment. The IAEA also provides guidance on the safe management of radioactive materials released into the marine environment, on the sustainable use of coastal and marine resources, and on the protection of the general public, including the maritime workforce.

Quality-assured data and high-quality data management are prerequisites for making informed decisions on action plans and measures to protect the oceans, to assure the sustainable delivery of ecosystem services and to enhance human health and prosperity. The IAEA **provides analytical quality control services** to Member States through the production of Certified Reference Materials, the organisation of inter-laboratory comparison studies and Proficiency Tests, and **assists** its Member States **in building quality-assured global databases on radionuclides and hazardous contaminants in diverse marine samples.**

In **2015**, the IAEA published a report on the radiological assessment procedure to determine the suitability of materials for disposal at sea under the terms of the London Convention and Protocol, as well as an updated report on the database of historical dumped radioactive waste, nuclear submarines, cargo ships and planes transporting nuclear materials and weapons, that suffered accidents resulting in actual or potential releases of radioactivity to the marine environment and losses of radioactive sealed sources during transport or applications regarding off-shore oil and gas industry.

Also in **2015**, the IMO's Marine Environment Protection Committee (MEPC) issued its updated guidelines for the development of the inventory of hazardous materials in ships, incorporating the list of radioactive materials determined by the IAEA as relevant for such inventory.

Technical advice on the development of radiological environmental marine waters quality assessment criteria for protection of humans and marine flora and fauna provided by the IAEA to the OSPAR Convention was approved by the OSPAR Radioactive Substances Committee in February **2016**.

In May **2016**, the IAEA-hosted Ocean Acidification-International Coordination Centre (OA-ICC) co-organised the 4th International Symposium on the Ocean in a High-CO₂ World, bringing together ocean acidification experts from around the globe.

The reports of the working groups of the IAEA's four year "Modelling and Data for Radiological Impact Assessments" programme (MODARIA), concluded in 2015, will be published in the IAEA Series in late **2016**. A successor programme MODARIA II will also be launched in **2016**.

As the only UN System Organization operating marine laboratories, the IAEA provides, inter alia, support to its Member States to develop and improve relevant nuclear and isotope-based tools and techniques, to monitor and support efforts to protect the coastal and marine environment. This support is provided primarily by the IAEA Environment Laboratories in Monaco and the IAEA Technical Cooperation Programme.

The IAEA Environment Laboratories implement activities, improve knowledge, and develop methods to assist Member States laboratories and Regional Seas Conventions to accurately monitor the behaviour of radionuclides, organic contaminants (including Persistent Organic Pollutants), hazardous

trace elements, such as mercury, and marine biotoxins (Harmful Algal Blooms-HABs), and contribute to mitigate their impacts on society. Monitoring concentrations of these contaminants in environmental matrices and biota helps Member States enhance knowledge on biomagnification in marine organisms, seafood safety, coastal and marine pollution, and the oceanic carbon cycle, particularly in the context of future climate change scenarios. Such work helps Member States fulfil their obligations in the framework of Global Conventions, such as the Stockholm Convention on Persistent Organic Pollutants and the Minamata Convention on Mercury, as well as for the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities.

Furthermore, the IAEA Environment Laboratories provide analytical quality control services to its Member States through the production of Certified Reference Materials, the organisation of inter-laboratory comparison studies and Proficiency Tests. The IAEA assists its Member States in building quality-assured global databases on radionuclides and hazardous contaminants in diverse marine samples, which is essential information for accurately assessing pollution status and trends in the coastal and marine environment, as well as facilitating the comparability of similar data world-wide. In 2015 and 2016, the IAEA has continued to work closely with the government of Japan to verify the quality of marine monitoring data following the Fukushima Daiichi nuclear accident.

Since 2012 the IAEA Environment Laboratories in Monaco have been hosting the Ocean Acidification-International Coordination Centre (OA-ICC), supported through the IAEA Peaceful Uses Initiative (PUI). The second phase of the OA-ICC serves all ocean acidification actors and stakeholders (scientific community, policymakers, media, and the general public) by facilitating, promoting and communicating global efforts on ocean acidification, including select research activities. The OA-ICC co-organised the 4th International Symposium on the Ocean in a High-CO₂ World in May 2016, bringing together ocean acidification experts from around the globe.

Preamble, §§ 53, 98, 169, 196, 199, and 214 of resolution 70/235:

The IAEA continued to contribute towards the safe management of radioactive materials released into the environment, providing guidance for the radiological protection, conservation and sustainable use of the marine environment and its resources, including the prevention of damage to marine flora and fauna, the protection of the public and the safety of marine workers. The IAEA cooperates with the International Maritime Organization (IMO), the contracting parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and relating Protocol, (the London Convention and Protocol), the Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention), and the Convention for the Safe and Environmentally Sound Recycling of Ships (the Hong Kong Convention).

The IAEA recently assisted the London Convention and Protocol in further developing methodologies and procedures for performing radiological assessments to determine whether material that is considered for dumping into the oceans represent negligible radiological impact to the marine environment and, consequently, can be dumped under the terms of the convention. This work is summarized in the report¹ published by IAEA in 2015, which presents the detailed radiological assessment procedure to estimate doses to marine workers and members of the public, and doses to representative species of marine flora and fauna, arising from disposal of materials at sea. The radiological assessment procedure included in the report was approved by the governing bodies of the London Convention and Protocol² in October 2015 and the IMO's Guidelines for the Convention are currently being updated accordingly.

¹ IAEA, *Determining the Suitability of Materials for Disposal at Sea under the London Convention 1972 and London Protocol 1996: A Radiological Assessment Procedure*, IAEA-TECDOC-1759, Vienna, 2015.

² Resolution of the contracting parties of London Convention and Protocol LC 37/16, Annex 9.

Preamble, §§ 53, 169, 183 and 199 of resolution 70/235:

Technical advice on the development of radiological environmental marine waters quality assessment criteria for protection of humans and marine flora and fauna was provided by the IAEA to the OSPAR Convention and approved by the OSPAR Radioactive Substances Committee in February 2016³. The derivation of these criteria is based on considerations of radiation doses estimated for members of public due to the presence of natural and man-made radionuclides in the marine environment resulting from discharges from land-based nuclear, industrial and medical activities; with the calculated radiation doses taking account of the consumption of seafood and human activities near the coast. Furthermore, radiation doses to representative species of marine flora and fauna are also estimated and considered to define the assessment criteria. The assessment procedure proposed by the IAEA will be considered by the OSPAR Commission, with the intention of them being adopted into the procedures of the Convention in order to assess the radiological impact due to radionuclide discharges to the North-East Atlantic from land-based installations.

Preamble and § 53 of resolution 70/235:

The IAEA published the results of the process of updating the database on the inventory of historical disposals, accidents and losses in the oceans involving radioactive materials. This database, developed in close cooperation with the IMO and IAEA Member States, includes records on dumped radioactive waste, nuclear submarines, cargo ships and planes transporting nuclear materials and weapons that suffered accidents and losses of industrial radioactive sources during transport or applications regarding oil and gas prospecting and extraction. The aim of this database is to provide an official record of artificial radioactive materials, which have entered the seas. It is also intended to be used as an information base to assess the potential radiological impact from man-made radionuclides in the marine environment. The report on this database⁴ was published by the IAEA in October 2015. The main text of the publication contains summary information from the database, including tables and global maps on sea dumping and confirmed accidents at sea, resulting in actual or potential releases of radioactivity to the marine environment. Additional relevant detailed information, including maps and tables with geographical coordinates by country, the description of the radionuclides involved and, when available, the characteristics of the supporting matrixes and the packages used for dumping, and the historical circumstances related to the accidents occurred at sea, is provided on the CD, which accompanies the report. The CD also includes the full database in Geographic Information System (GIS) format.

Preamble, §§ 53, 98, and 214 of resolution 70/235:

The IAEA assists the IMO's Marine Environment Protection Committee (MEPC) and the Hong Kong Convention in developing guidance and recommendations relating to radioactive materials, such as threshold levels of radioactive materials to be applied for the safe and environmentally sound recycling of ships. These values are required by the shipbuilding and recycling industries for the identification of radioactive sources that are widely used in ships, such as lightning rods, high intensity discharge lamps, smoke detectors, self-luminescence signs and all kinds of industrial gauges. Types and characteristics of these radioactive industrial sources should be incorporated in the inventory list of hazardous materials during the whole lifetime of a ship and prior to recycling. The identification and separation of such sources before the recycling process begins is essential in order to ensure the radiation safety of workers, the public and the environment, and to avoid contamination of recycled steel and the radiation risks associated therewith. The type of radioactive sources determined by the IAEA which could have a potential radiological impact on humans and

³ Resolution by the OSPAR Radioactive Substances Committee, paper RSC 16/04/01.

⁴ IAEA, *Inventory of Radioactive Material Resulting from Historical Dumping, Accidents and Losses at Sea (for the Purposes of the London Convention 1972 and London Protocol 1996)*, IAEA-TECDOC-1776, Vienna (2015).

environment if improperly handled during the recycling of ships, was incorporated in the updated guidelines⁵ issued by the MEPC in 2015.

§§ 10, 12, 13, 15, 27, 178, 183, and 186 of resolution 70/235:

To improve Member States' scientific knowledge and the capabilities for the assessment of the level of protection to the public and the environment, including flora and fauna, against the exposure to ionizing radiation associated with authorized radionuclide releases, disposal of radioactive waste and from contamination resulting from past unregulated practices or accidents, the IAEA continued the programme titled "Modelling and Data for Radiological Impact Assessments" (MODARIA), which focuses on areas with existing uncertainties in the predictive capability of environmental models. The MODARIA programme consisted of ten working groups covering different radiation protection topics, including radiological protection of marine biota, dispersion of radionuclides in the marine environment and the transfer of radionuclides accidentally released from land-based facilities. More than 150 experts from 42 IAEA Member States, including several from developing countries in Africa, Latin America and the Caribbean, Asia and the Pacific, receiving financial support, participated in this programme. It also provided an international forum for the exchange of experience, ideas and research information. The reports with the results of the working groups in the MODARIA programme are being prepared and its publication in the IAEA Series, supporting the IAEA Safety Standards is expected in late 2016. MODARIA II, to be launched in 2016, is in preparation and will include topical areas related to the protection of humans and the marine environment, including resources and the flora and fauna, such as on modelling radioactive releases to the marine environment and the potential effects of climate change in the safety performance of high-level radioactive waste disposal facilities, for example, due to sea-level rise.

⁵ MEPC, *2015 Guidelines for the Development of the Inventory of Hazardous Materials*, MEPC resolution 68/21/Add.1 Annex 17