

IAEA Input to 2019 SG report on oceans and the law of the sea (RES 74/19)

Second part

Overview

The International Atomic Energy Agency (IAEA) continues to provide support to its Member States on developing and improving nuclear and isotope-based tools and techniques to monitor the coastal and marine environment. The Agency provides safety guidance on the regulatory control of releases of radioactive effluents into the marine environment, on the environmental monitoring and surveillance of nuclear facilities and on the assessment of radiological impacts on the public and on marine flora and fauna. Through this guidance, the IAEA helps to ensure the existence of an appropriate international framework for the conservation and sustainable use of the marine environment.

The IAEA is the only organisation in the UN system with marine laboratories. It implements a broad range of activities to improve knowledge and develop methods to help Member States to accurately monitor the behaviour of radionuclides, organic contaminants (including persistent organic pollutants-POPs), hazardous trace elements such as mercury, and marine biotoxins (harmful algal blooms-HABs), and to assess their impacts on marine biota and ecosystems.

The Monaco-based IAEA Environment Laboratories provide Member States with science-based information to address anthropogenic, climate change, and ocean change impacts. Monitoring concentrations of these contaminants in environmental matrices and biota helps Member States to strengthen their seafood safety programmes, address coastal and marine pollution and study aspects of the oceanic carbon cycle in order to better anticipate the possible future impact of climate change.

In this way, the IAEA helps Member States to engage in the UN SDG process, fulfil their obligations in the framework of global Conventions such as the Stockholm Convention on Persistent Organic Pollutants and the Minamata Convention on Mercury, and implement the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities.

In 2018, the IAEA published Safety Guides on *Regulatory Control of Radioactive Discharges to the Environment* (IAEA Safety Guide GSG-9) and *Prospective Radiological Environmental Impact Assessment for Activities and Facilities* (IAEA Safety Guide GSG-10).

Related to §§ 10, 11, 12, 13, 14, 15 of resolution 74/19

The IAEA continued supporting the Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA) network, a collaboration of 187 analytical laboratories from 89 countries that work together to address standardization and validation of analytical methods. It supports the network through proficiency tests, interlaboratory comparisons, training and coordination.

Between 2014 and 2019, under a project entitled *Marine Monitoring: Confidence Building and Data Quality Assurance*, which was initiated as a follow-up activity to recommendations related to the decommissioning of the Fukushima Daiichi nuclear power plant in Japan, the IAEA has organized nine sampling missions to collect seawater, sediment and fish samples for interlaboratory comparisons.

It provided analytical quality control services through the production of certified reference materials, the organization of interlaboratory comparison studies and proficiency tests. This assisted Member

States in building quality-assured databases on radionuclides and hazardous contaminants in diverse marine samples, essential information for accurately assessing pollution status and trends in the coastal and marine environment, as well as facilitating the comparability of similar data worldwide.

The Helsinki Commission and the Oslo-Paris Convention Contracting Parties are being provided with analytical data quality support through annual proficiency tests for radionuclides in seawater samples. Marine radioactivity monitoring data from these two regional conventions are made available through the Agency's online open-access database, the *Marine Radioactivity Information System* (MARIS). In addition, the Barcelona Convention – Mediterranean Action Plan (MAP) is being supported in the quality assurance of monitoring data for non-radioactive contaminants, such as persistent organic pollutants and hazardous trace elements.

MARIS has since 2005 hosted and shared the results of measurements of the levels of radioactivity in the marine environment undertaken in laboratories around the world. As of May 2020, MARIS contained 590,539 data items for over 100 different radionuclide concentrations or radionuclide ratios in seawater and in sediments, in over 800 species of biota, including commercially valuable species such as seafood, and in suspended matter from both the open ocean and coastal locations. These data can be traced back to more than 200 scientific publications, reports and databases developed by institutes in Member States, regional and international collaborations and projects. In support of SDG 14 (Life Under Water), MARIS now provides environmental scientists, policy makers and the general public with improved access to recent and historical marine radioactivity data from laboratories around the world.

Related to §§22, 23, 209, 210, 211, 212, 213, 214, 274 of resolution 74/19

Since 2012, the IAEA has hosted the Ocean Acidification-International Coordination Centre (OA-ICC), which facilitates, promotes and communicates about global efforts on this subject, including through targeted research activities that advance knowledge of ocean acidification impacts. The OA-ICC co-organizes or participates in a number of high-level symposia or events every year.

In 2019, the OA-ICC was involved in several international events to advance ocean acidification science and awareness. In October, an IAEA Interregional Technical Cooperation project coordination meeting was held in Guayaquil, Ecuador, while the second regional meeting of the Ocean Acidification International Reference User Group was held in Zanzibar, Tanzania.

The OA-ICC participated in five side events during the UN climate change conference COP25 in Madrid, Spain in December 2019. In January 2020, it supported an international capacity building workshop on ocean acidification held in Kolkata, India. The OA-ICC continues to work closely with IOC-UNESCO and the Global Ocean Acidification Observing Network on developing new methodologies and guidelines for countries to report on SDG14.3 (ocean acidification). It is also co-focal lead of the UN Community of Ocean Action on Ocean Acidification, a process to facilitate progress on more than 250 Voluntary Commitments submitted by various stakeholders across the globe on SDG14.3.

Related to §§215 of resolution 74/19

The IAEA, through a Peaceful Uses Initiative (PUI) project on marine plastics, provides information and solutions to laboratories in Member States on the potential impacts of ingested microplastic particles on marine organisms such as corals, fish, and shellfish. Plastics-related organismal stress has been

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evaluated using a suite of complimentary nuclear techniques such as *in vivo* NMR (nuclear magnetic resonance) and omics. The potential role of microplastics as a vector for diverse co-contaminants, including organics and trace elements, is also being evaluated.

Through strong international coordination and capacity-building efforts, the IAEA provides support and knowledge exchange for its Member States to address their most pressing marine plastic pollution challenges. Agency-led activities and enhanced partnerships with UN organisations such as FAO, IOC-UNESCO, UNEP and UNDP support global UN initiatives such as the Decade of Ocean Science for Sustainable Development.

Research to elucidate the effect that halogenated flame retardants have on the marine ecosystem has been pursued in the framework of two PUI initiatives on seafood safety and marine microplastics. New certified reference material is being developed, with low levels of halogenated flame retardants as one class of persistent organic pollutants being certified in marine biota.

The efforts of the IAEA's marine laboratories on the analysis of mercury and its highly toxic species methyl mercury were recognised when the Agency officially joined the UNEP Global Mercury Partnership. The IAEA is assisting countries in implementing the UNEP Minamata Convention on Mercury by providing certified reference material. All these efforts are strengthening the reliability of analytical monitoring data for contaminants in the marine environment.

Related to §§192,199 and 218 of resolution 74/19

The IAEA continues to cooperate with the International Maritime Organization and the contracting parties of various international and regional conventions related to the prevention of pollution and the sustainable use of the marine environment and its resources, such as: the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 and its corresponding Protocol (the 'London Convention' and the 'Protocol'), the Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention'), and the Hong Kong Convention for the Safe and Environmentally Sound Recycling of Ships (the 'Hong Kong Convention').

The IAEA is assisting the Radioactive Substances Committee of the OSPAR Convention in the definition and application of the concept of 'close to zero' concentrations of artificial radionuclides in the marine environment. This is in support of the OSPAR declaration that discharges, emissions and losses of radioactive substances should be reduced by r 2020 to the extent that additional concentrations in the marine environment above historic levels resulting from such discharges, emissions and losses, are close to zero.

Participants in the MODARIA II programme - Modelling and Data for Radiological Impact Assessments - held their fourth and final meeting at IAEA headquarters in Vienna in October 2019. During this four-year programme, a working group on *Assessment of Fate and Transport of Radionuclides Released in the Marine Environment* looked at different scenarios of marine environmental contamination and worked to improve ocean circulation and dispersion models used for environmental and radiological assessment. In 2019, the IAEA published a report of the previous MODARIA programme (2012-2015) on *Modelling of Marine Dispersion and Transfer of Radionuclides Accidentally Released from Land Based Facilities* IAEA TECDOC No. 1876.

Related to §§238 of resolution 74/19

June 2020

I In collaboration with OSINet, the oil spill identification network of experts, the IAEA developed new analytical methods to assess the potential provenance of contaminants during an oil spill. It is assisting countries with capacity-building in this area.

Related to §§333 of resolution 74/19

The IAEA provides science-based information and solutions to Small Island Developing States (SIDS) to address pressing marine topics, such as coastal pollution, habitat degradation and nuisance algal blooms such as sargassum. In November 2019, a technical meeting with representatives of 13 SIDS nations from the Caribbean and South Pacific regions was held in Kingston, Jamaica, to discuss environmental characteristics and drivers of these new sargassum bloom events. Participants also explored ways in which science, and nuclear and isotopic techniques in particular, may help in enhancing understanding and improving the situation.

Related to §§353, 357 of resolution 74/19

The IAEA is collaborating with the UN Environment Programme Mediterranean Action Plan to assist with quality assurance of the monitoring of contaminants in the marine environment as part of the Programme for the Assessment and Control of Marine Pollution in the Mediterranean. In 2019, two training courses and two proficiency tests were organized on the analysis of organic and inorganic pollutants in marine samples. Since the beginning of this collaboration with UNEP, the IAEA has jointly organised 62 training courses and 52 proficiency tests involving more than 375 representatives from most Mediterranean countries to strengthen regional pollution monitoring.