

**PROJECT PROGRESS REPORT (2020)**  
**IAEA/RCA RAS7028 Project “Enhancing Regional Capabilities for Marine Radioactivity Monitoring and Assessment of the Potential Impact of Radioactive Releases from Nuclear Facilities in Asia-Pacific Marine Ecosystems (RCA)”**

**a) Objective of the project**

The Asia-Pacific region is highly reliant on ocean resources related to seawater, sediments and marine biota. This area is vulnerable to a range of issues including anthropogenic discharges, climate change, coastal erosion, population pressures and degradation of marine resources. In recent times, the Fukushima Daiichi Nuclear Power Plant accident in 2011 emphasized the importance of radionuclide monitoring of the marine environment in Asia-Pacific region. Numerous new nuclear power plants are expected to be built in the Asia/Pacific region in the future. The transboundary nature of regional ocean currents will also disperse any future nuclear discharges throughout the region. This Regional Cooperative Agreement (RCA) project was established to improve the regional capabilities for marine radioactivity monitoring and assessment of the potential impacts of radioactive releases from nuclear facilities. The aim was to have a harmonized regional approach to the generation of monitoring data that is both qualities assured and comparable between participating Government Parties (GPs).

**b) Regional event**

The Mid-Term Review Meeting for the RCA Project RAS/7/028 that was held in Thailand in 2018 resulted in some agreed activities during the rest period of the Project. Since the last review meeting in 2018, two regional training courses and four regional workshops have been successfully implemented in 2019. And in 2020 was planned 1 RTC on Radioecology Laboratory Studies; 3 RWS on Radiological Dose Assessment, on Uncertainties and Detection Limits, on Final Data Analysis Report; and 1 Project Final Review Meeting. RWS on radiological Dose assessment was successfully implemented in February 2020 and a progress review meeting virtually implemented using Microsoft (MS) Teams in November 2020. The RCA Project RAS/7/028 commenced in 2017 and was due to finish at the end of 2020, however, the impact of the pandemic in 2020 resulted in travel restrictions causing a delay in the delivery of key training programs and activities. The remaining regional activities include RWS on Data Analysis, RWS on the determination of Uncertainties and Characteristic Limits, and Final Project Meeting as part of Project work plans was planned to be held in 2021, with an understanding that some restrictions may still be in place.

**Table1. Status event during 2019-2020: Completed and planned Remaining Events in 2021**

No	Title of Event	Country	Date
1.	The RTC on Gamma-ray Spectrometry: 2 weeks. <b>(completed)</b>	AUL	26 Aug-6 Sept 2019
2.	The RTC on Dose Assessment and Risk Analysis Modelling: 1 week. <b>(completed)</b>	CHN	28 Oct – 1 Nov 2019
3.	RWS on Monitoring Guidelines: 1 week. <b>(completed)</b>	INS	4-8 March, 2019

4.	RWS on Implementation of Quality management System: 1 week <b>(completed)</b>	MAL	29 April – 3 May, 2019
5.	Proficiency Test for Radionuclides in Marine Environmental Samples <b>(completed)</b>	-	2019
6.	RWS on Radiological dose assessment and communication including seafood consumption : 1 week <b>(completed)</b>	PHI	24-28 Feb, 2020
7.	Proficiency Test for Radionuclides in Marine Environmental Samples <b>(sample dispatched)</b>	-	2020
8.	RWS on Marine Radioactivity Data Analysis and Reporting: 1 week <b>(planned)</b>	Virtual	(Q3) Sept 2021
9.	RWS on Uncertainties and Characteristic Limits: 1 week <b>(planned)</b>	Virtual	(Q3) August 2021
10.	Project Final Review Meeting: 1 week. <b>(planned)</b>	SIN	(Q4) Nov 2020

### c) Project progress and achievement

Quality assured marine environmental samples data will be well generated by conducted the RWS on Uncertainties and Detection Limits and RWS on Final Data Analysis Report. Both activities were postponed in 2020 and planned to be held in 2021. Regional skills in the marine environmental sampling were also interpreted by the number of data submitted to the ASPAMARD (Asia-Pacific Marine Radioactivity Database). The database covers the three main sample types: seawater, sediment, and biota and includes many radionuclides (Cs-137, Cs-134, Po-210, C-14, Sr-90, Th-232, Ra-226, Pb-210, K-40, U-238, and Pu-239/240). In 2019 approximately 3.200 data were submitted to the group and in 2020 more than 37.000 data points were included. Currently, the total number of data stands at 40.689. One of the aims of this project was to have an opportunity to share data across the region, by ASPAMARD submitted data will be shared with MARIS and will be available to scientists and researchers, and will enable future scientists, to look for changes and dynamics in the marine system.

Improvement regional skills in marine radiochemistry are greatly helped by the existence of Document Guidelines for the Sampling, Preparation, and Radio-analysis of Marine Matrices. The guideline was prepared in collaboration of all members of the project and use for their laboratory needs. Radio analytical methods in the guideline cover the main radionuclides: Cs-17, Sr-90, Pu isotopes, Po-210, and H-3. Most of the methods listed have been used in various regional training courses during the lifetime of the project. The document also lists the common sampling categories (sample matrices) in addition to providing a list of suggested biota, based on what could be reasonably sourced within the region. The aim of this project is to produce quality-assured data by the adoption of basic quality requirements and internal and external quality control. Therefore, not only for radiochemistry analysis purposes, this document also provides some guidance on the determination of uncertainties. In addition, quality management is an important aspect of sample monitoring and analysis. The document provides some guidance to quality the establishment of a

quality system. By the existence of the document guideline hope that quality-assured marine radioactive contamination monitoring data are very well to perform. The latest draft for the Guidelines document has been reviewed and there were some suggested editorial changes. It is anticipated that the Guidelines document could be finalized and published by the end of the project. IAEA proficiency testing activities also have been supporting the regional skill in marine radiochemistry of the RAS7028 laboratories. The number of participants from Asia-Pacific has increased over the last few years: 9 in 2017, 12 in 2018, and 14 in 2019 with the positive progress of accepted result among participated laboratories, which means the skills in radiochemistry analysis were improved.

RWS on Radiological Dose Assessment in Philippines on February 2020 was held to enhance regional capabilities in dose assessment associated with the radioactive contamination in the marine environment. The main outcomes of the workshop were coordination of approaches, training, and development of a trial run of a cooperative seafood dose assessment that spans the range of RCA Project RAS/7/028 countries. Each country has improved their marine environmental monitoring data in recent years. Each country also has varying seafood diet habits/consumption rates as well as some differences in their measured radionuclide activity concentrations. The workshop was successful in coordinating data and approaches for biota and human consumer dose assessments. The workshop increased confidence by the countries in implementing valid dose assessments and increased ongoing connection and communication among countries on this topic. With regards to enhancing regional capabilities in risk modeling, RTC in China was performed in 2019 on Dose Assessment and Risk Analysis Modelling in China.

#### **d) Project constraints**

Most GP's RCA members reported some constraints, delays in the improvement and upgrading of the laboratory because of the prolonged quarantine period and the manpower problem due to the reduced workforce in their national institute have slowed down the implementation of the national project. The pandemic resulted in the postponement or delay of some national work plans, including some monitoring programs and analysis of samples. Even though most countries have been affected by the restrictions due to the pandemic and in many cases programs have been postponed or canceled but the efforts had been made to continue the country work plans including monitoring and analysis of samples.

#### **e) Substantive issues**

To generate comprehensive strategic and sustainable analysis of the extent and impact of radioactive releases to the marine environment needs full commitment from GP's RCA member and absolutely from the Agency. Postponed, reduced, or even canceled both national and regional programs as the effect of the pandemic condition strongly recommend to keep conducted in next 2021 to reach the Project outcome.

## Proposed Workplan 2021, RCA RAS/7/028

No.	Title of Event	Date	Objective/purpose	Remarks
1	RWS on Uncertainties and Characteristic Limits	1 week in August Exact dates to be confirmed	<p>Objective:</p> <ul style="list-style-type: none"> <li>- Assess the determination of characteristic limit (decision thresholds, detection limit and limit of the confidence interval) using examples of country method of analysis to strengthen understanding of the concept for data reporting</li> <li>- Produce qualified data for other IAEA projects/groups such as ALMERA</li> </ul> <p>Target participants: Nominees should be National Project Coordinator or National Project Team officially designated for RAS7028</p> <p>Estimated number: up to 25 participants</p>	Virtual Mode 3 lecturers
2	RWS Final data analysis Report	1 week Sept 2021 To be confirmed	<p>Objective:</p> <ul style="list-style-type: none"> <li>- Advanced training in marine environmental radioactivity</li> </ul>	Virtual Mode 1 expert

			<p>data analysis and reporting (plan is to get support from MARIS team)</p> <ul style="list-style-type: none"> <li>- Application to evaluation of project data and drafting of technical project report</li> </ul> <p>Target participants: Nominees should be National Project Coordinator officially designated for RAS7028</p> <p>Estimated number: up to 25 participants</p>	
3	Project Final Review Meeting	Nov 2021 To be confirmed	<p>Objective:</p> <ul style="list-style-type: none"> <li>- Review achievements of each participating country</li> <li>- Assess project success against outputs and outcomes</li> <li>- Draft project report</li> <li>- Carry out gap analysis and prepare list of priorities for future capacity building in the region</li> </ul> <p>Target participants: All countries in RCA RAS7028, nominees should be National Project Coordinator officially designated for RAS7028</p>	Face to face – SIN 1 expert

			Estimated number: up to 25 participants	
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