**ENHANCING SUSTAINABLE NUCLEAR SECURITY OPERATIONS THROUGH PARTICIPATION IN THE COORDINATED RESEARCH PROJECT ON IMPROVED ASSESSMENT OF INITIAL ALARMS**

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**Abstract**

Implementation of an effective National Nuclear Security culture is a responsibility of a member state. International Atomic Energy Agency provides necessary guidelines to establish the national nuclear security strategies to strengthen the detection capabilities at the border monitoring operations. Colombo sea port is globally important as much as to the country. Required security measures at the Colombo port has been established by the Sri Lankan Government and the Radiation detection is performed by well-established systems consisted of Radiation Portal Monitors. The team of Sri Lanka Customs attached to the megaport surveillance unit and Sri Lanka Atomic Energy Board corporately working to overcome the challenges of Radiation detection at the port. IAEA coordinated research project on improved assessment of initial alarms is providing an ample opportunity to address the current challenges of the port. The paper presents the achievements obtained by participating the coordinated research project J02005.

1. INTRODUCTION

Establishment of nuclear security is a responsibility of a Member State. Meeting international obligations and effectively implementing national nuclear security strategies can be a challenging activity, oftentimes made complicated by the need to implement and sustain national detection strategies that use both instruments and information.

Sri Lanka is an island country with its seaports serving as a vital national economic and security connector to the global community. Not only does the major port of Colombo serve as a gateway for commerce into and out of Sri Lanka, the seaport also serves as an important gateway for east-west transshipment of goods. The security of commerce through the seaport is globally important, and Sri Lanka is proud of its efforts to ensure the nuclear security of cargoes moving through the port to reduce the likelihood of illicit trafficking in nuclear and other radioactive materials, and also to ensure the safety of cargo moving through the port.

Sri Lanka has installed and operates a sophisticated system of radiation detectors at the seaport to monitor cargo – providing nuclear security detection capacity and safety to ensure that radioactively contaminated goods and/or radiological sources out of regulatory control are detected and safely removed from commerce. The Sri Lanka Atomic Energy Board (AEB) and Sri Lanka Customs are two of the agencies involved in the detection operations and were faced with numerous sustainability challenges ranging from equipment sustainability, training, expert knowledge of equipment, and nuclear security culture.

To address a number of these challenges, the AEB and Customs decided in year 2015 to join the IAEA Coordinated Research Project on Improved Assessment of Initial Alarms from Radiation Detection Equipment(J02005). The participation in this CRP has yielded benefits far beyond the initial expectations. The improvement in alarm resolution processes through the use of a Tool for Radiation Alarm and Commodity Evaluation (TRACE) has resulted in more effective, efficient, and consistent alarm resolution and improved training.

1. CHALLENGES OF PRESENT SYSTEM

Colombo seaport is the largest & busiest port of the country. It annually handles about 5.0 million TEU of containerized cargo. Mostly, movements of transshipment cargo containers are performed. All the cargo containers are monitored by the well-established radiation measuring system with the Radiation Portal Monitors (RPM). The system is handled by the Sri Lanka Customs with the assistance of Sri Lanka Ports Authority [1]. Generally, hundred alarms per hour is detected through the system due to the presence of Naturally Occurring Radioactive Materials (NORM). To verify all the alarms and perform the secondary inspections with other hand held devices are time consuming process and it affects the port operations. Custom officers do not usually have a detailed training in physics and the time to make a decision is limited for the alarm assessment. Also, according to Sri Lankan official policy of the customs, custom officers should change their working place in every six months. Therefore, proper training mechanism and easy training materials are needed to understand the alarm assessment mechanism within a short period of time. Establish and continue the proper relationship between other local & foreign agencies related to Radiation Detection in borderline, Instrument calibration & Maintenance, Updating the threats & trends in Nuclear Security in the world and region are the main challenges to face by the system.

1. OUTCOMES & BENEFITS

During the project, the experts and Front-Line Officers (FLOs) such as custom officers in the same field were identified within each member state. Technical knowledge and onsite experiences (FLO/ Experts) are shared with the team and possible solutions & best practices were also discussed. Several Technical Visits, and Technical meetings were organized by the project, so that the project members could obtain information about real-time operations, mechanisms and research activities etc. Such as Technical visit to Colombo port in year 2016, Technical visit to Laem Chabang Seaport, Thailand in year 2018. Some of the team members of Sri Lanka were identified as experts in the field and their experiences were shared among the other members to enhance the quality and efficiency of research activities.

Tool for Radiation Alarm and Commodity Evaluation (TRACE) has been introduced for quick assessment of alarms. It is more effective, efficient, and has a consistent alarm resolution for improved training facility. TRACE App provides a lot of information on NORM commodities and their applications. According to the feedback received for questionnaires distributed among the FLO’s who use the TRACE in their alarm assessment activities, they highly recommend it as a good & trusted learning material for FLOs. Also, IAEA’s short video clip of TRACE has gained attention among the FLOs.

TRACE Mobile app is adopted to the current training system and to the operation procedures for alarm assessment in the Colombo megaport surveillance unit (MSU) [2].

Encouragement to publish the outcomes of research activities in international publications were continuously done by the IAEA. By now, two international publications has been published with the findings of researches in year 2018 & Ninth International Symposium on Naturally Occurring Radioactive Material of 2019.

During the project, detection capabilities of hand held instruments were also discussed. Practical issues and technical advices were exchanged among the experts and member states. It was instrumental to identify the requirement of another Coordinated Research Project with several Technical meetings and research activities.

Cooperation between local agencies and foreign agencies is playing key role to ensure the accuracy & durability of the detection system of Colombo port. Proper channels of operations were identified and assistance was obtained when necessary to verify the alarm information or to identify the need of further analysis. IAEA Technical support for Sri Lanka Customs was obtained with the assistance of Sri Lanka Atomic Energy Board to handle the real cases in radiation detections.

1. IMPROVEMENTS OF SUSTAINABILITY OF NUCLEAR SECURITY CULTURE IN SRI LANKA

Another important, and often overlooked benefit of participation in IAEA CRPs, is the enhanced opportunities for international collaboration. The CRP has provided an excellent pathway for Sharing knowledge, experience and best practices through:

o Technical & Scientific Visits among other CRP members,

o Technical workshops to share knowledge on enhanced alarm and data analysis capabilities, and

o Interactions with technical experts and equipment manufacturers.

- Joining professional and nuclear security networks (IAEA- FLO, IAEA-NSSC, World Custom Organization)

The participation in the CRP on Improved Assessment of Initial Alarms had given a great positive impact on the nuclear security capacity building of Sri Lanka. The tangible benefits have been discussed and the enhanced knowledge and skills will help to sustain an effective nuclear security detection mechanism. Sri Lanka expresses its gratitude to the IAEA for the support and opportunity to participate in the CRP program. Sri Lanka encourages other Member States to join CRPs. Also, it is requested from the IAEA to continue this very successful program that addresses Member States’ needs through mutual participation and capacity building.

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