

Building Capacity in Member States through Coordinated Research Activities – Increased understanding and performance in nuclear security in Albania

The Institute of Applied Nuclear Physics (IANP) was established in 1970, and is the main user of the radioactive sources in Albania. IANP is a focal point and the main user and provider of nuclear and nuclear related techniques in the country and conducts research, applications, education and expert training in this field. According to Decision No. 563, 22.08.2007 of the Council of Ministers, IANP supports the Albanian Atomic Authority for the promotion of nuclear and related techniques and knowledge in the country.

IANP provides advice and services to the governmental and other institutions related with nuclear applications, radiological emergency response, radioactive waste management, security of nuclear and radiological facilities, combating illicit trafficking of radioactive materials and is the main transporter of radioactive materials and radioactive sources for whole country.

IANP has excellent cooperation with International Atomic Energy Agency through Technical Cooperation programme and Technical Cooperation Department (National, Regional, Interregional Projects) and Coordinated Research Projects (CRP) with Department of Nuclear Safety and Security.

In 2016 IANP joined the CRP J02005 titled “Improved Assessment of Initial Alarms from Radiation Detection Instruments” with Research Contract Title “Collection and Analysis of Radiation Detection Data for Alarming Containers”, and in 2018 joined the CRP J02012 titled “Advancing Radiation Detection Equipment for Detecting Nuclear and Other Radioactive Material out of Regulatory Control” with Research Contract Title “Analysis of Human Engineering Interface with Radiation Detection Equipment’s for determining optimal equipment specifications”.

Participation in the CRP J02005 and the knowledge gained in strengthening the understanding of the performance and assessment of alarms from radiation portal monitors (RPMs), that comprise the backbone of radiation detection system operations in Albania, has been a great support in improving systems (equipment and operations) sustainability. The activities under this CRP consist of obtaining information on radiation alarms (from declared radioactive material shipments, commodities causing an alarm from the presence of radionuclides of natural origin, and other shipments or occupancies of portal monitors) including the physical characteristic of the commodity, the conveyance with the commodity, and the radiation detector data for that commodity. The compilation of data has been instrumental in the development of tool that can assist in the effective, efficient, and consistent assessment of alarms – and with the advantage of sustainable training options. The software tool called TRACE (Tool for Radiation Alarm and Commodity Evaluation) also provides an easy to use reference library for assessing the information associated with a radiation alarm. To better understand the response of the RPMs to potential nuclear security threat and general commerce occupancies, a number of experiments have also been performed. The experiments provided further information on the response of RPMs to alarming commodities under varying circumstances. Arrangements were made to run the same vehicle through multiple RPMs (even at different sites and different speeds) to obtain and compare RPM profiles between different types of detectors and various natural background conditions. The result of these investigations and participation in the CRP activities (including networking and project meetings) has greatly increased Albanian understanding of RPM operations and improved the sustainable use of the systems for nuclear security and facilitation of safe and secure trade. The capacity building outcome of the CRP should be recognized.

IANP is also an active participant in CRP J02012 where the work has been focused on research experiments with different portable radiation detection instruments to perform important human factors studies related to specifications of handheld and backpack-borne radiation detectors. IEC and other standards for radiation detectors provide guidelines for weight and size of instruments but these are often not compatible with the actual operations the instrument will be used in. As a result, factors such as physical characteristics of the instrument user (age, height, sex, clothing (winter or summer)) have not been previously taken into account. In collaboration with Department of Physics in the Faculty of Natural Sciences, Albania conducted research experiments involving different form factors and weights of instruments against different age, weight, height, and sex of potential users (simulated initially by students and Institute of Applied Nuclear Physics personnel). The research experiments were performed in different weather conditions (winter/ summer) classroom and field conditions for determining optimal equipment specifications. These experiments have provided important on the ability of users to actually hold and operate detectors used for nuclear security operations given the weight, size, and form factor of the instrument. This information will support the revision of the IAEA’s Nuclear Security Series 1, Technical and Functional Specifications for Border Monitoring Equipment, and

improve the specification and procurement of instruments leading to more sustainable and effective nuclear security detection operations.

Albania has applied also to participate in the new CRP J02014 titled “Advancing Maintenance, Repair and Calibration of Radiation Detection Equipment” with Research Contract Title “Analysis of Radiation Detection Equipment Failures: Causes and Sustainable Maintenance Plans”. This CRP is expected to even further increase the human knowledge and capacity of Albania to better understand performance of Albania’s radiation detection systems and improve sustainability of them.

Participation in the CRPs has also provided Albania officials and experts an opportunity to expand professional and nuclear security networks by seeing, participating in, and developing new approaches to implementing effective nuclear security detection operations. Albania enthusiastically recommends continuation of the agency CRP activities and looks forward to further involvement in these important projects. Providing mechanism that enable Member States to jointly solve pressing problems builds capacity and ensures future sustainment of nuclear security systems. The small investment made in supporting research contracts can be easily shown to have huge positive returns.

Gender

Male

State

Albania

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