

## PNRA Technical Support Capabilities for Detection Technologies and Associated Challenges

The IAEA Code of Conduct on the Safety and Security of Radioactive Sources describes that in a State, the regulatory body should have the authority to monitor at all appropriate check points for detecting the orphan sources during their course of operation and to ensure proper storage of such radioactive sources. PNRA has developed various regulations for the effective control of radioactive sources based on the concept of “Cradle to Grave”. The national legislative and regulatory framework empowers PNRA for regulating and supervising all matters related to safety and security of radioactive materials.

The prevention of unauthorized use, storage and transport of radioactive materials requires the availability of a sustainable detection mechanism at national level. To ensure the sustainability and long term operation of detection mechanism, PNRA has established a Technical Support Unit (TSU) with complete spectrum of technical and scientific support capabilities. The capabilities include the preparation of equipment specifications as per end user requirements, acceptance and periodic testing to ensure the operation of equipment, protection and energy calibrations for optimization of equipment response. The TSU is also capable for identification of the fault in hardware and software of detection equipment and troubleshooting. At the national level, TSU is capable to provide technical assistance to the relevant stakeholders.

The radiation detection technologies available with TSU are Personal Radiation Detectors, Radionuclide Identification Devices, Contamination Monitors, Neutron Search Detectors, Radiation Survey Meter, High purity Germanium Detectors, analytical software’s for quantification and isotopic composition of radioactive materials. The procedures available with TSU describe the sequential process of use, analysis of radioactive materials, acceptance and periodic testing, calibration and maintenance of equipment. However, it is difficult for TSU to cover the full scope of repair, maintenance and calibration of software and hardware of equipment due to the challenges of compact design of the equipment.

The outcome of this paper will be to present the need of radiation detection equipment for the detection and interdiction of unauthorized movement of radioactive materials, technical and scientific capabilities of PNRA TSU for the testing, calibration, maintenance of radiation detection equipment and assistance to national stakeholders, challenges and recommendations for sustainable operations of radiation detection equipment. The challenges may include degradation of technologies with passage of time, requirements of refurbishment/upgradation, maintenance cost and repair/replacement of compact design equipment. The recommendations may include technical specifications to promote modular designs, repair capabilities of end users and availability of spares for replacement of faulty component.

### Gender

Male

### State

Pakistan

**Author:** ULLAH, ANAYAT (PAKISTAN NUCLEAR REGULATORY AUTHORITY)

**Co-authors:** Mr RIZWAN, Muhammad (PNRA); Mr AHMAD, Sajjad (PNRA); Mr SALEEMI, Majid Ali (PNRA)

**Presenter:** ULLAH, ANAYAT (PAKISTAN NUCLEAR REGULATORY AUTHORITY)

**Track Classification:** MORC: Building and maintaining nuclear security detection architecture