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# Thailand's Challenges of Becoming an ISO/IEC 17025 Accredited Nuclear Forensics Laboratory: A Scope of Qualitative Analysis of Uranium and Thorium in a Geological Sample Using Gamma-Ray Spectroscopy

The Nuclear Forensics Laboratory in Thailand was established in July 2014 at the Office of Atoms for Peace (OAP) through the support and collaborations of domestic and international partners. Thailand has implemented nuclear forensics to prevent and respond to nuclear security events and illicit trafficking of nuclear and radioactive materials in the country and the ASEAN region. OAP has developed the country's nuclear forensic framework by parallel implementing the main four parts: radiological crime scene management, laboratory analysis, nuclear forensics library development, and domestic nuclear security network. According to the precise framework, OAP has accomplished laying a foundation of nuclear forensics in Thailand.
Nevertheless, one of the most challenges in nuclear forensics is the capability of laboratory analyses. Due to an unpredictable of a wide range of samples and forms. Therefore, OAP deliberated to use an International Organization for Standardization ISO/IEC 17025 standard (General requirement for the competence of testing and calibration laboratories) as a tool to support and provide more confidence in the laboratory analyses. In addition, the ISO standard should assist the laboratory management to get into a system process. It is known that gamma-ray spectroscopy is a useful technique for non-destructive analysis in a nuclear forensics laboratory. It is capable of an isotopic determination for both nuclear and radioactive materials and it can achieve an early investigation. Then, OAP decided to start ISO/IEC 17025 accreditation with a qualitative analysis by using gamma-ray spectroscopy. After undergoing many steps, since June 2021 Thailand's Nuclear Forensics Laboratory is an ISO/IEC 17025 accredited nuclear forensics laboratory for qualitative analysis of uranium and thorium in a geological sample using gamma-ray spectroscopy. This successful achievement will lead to a scope expansion in the ISO system with other instruments in the laboratory. Benefits and challenges during steps of preparation and after ISO/IEC 17025 accreditation will be provided in this paper.

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