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AN IAEA NUCLEAR FORENSICS COLLBORATING CENTRE IN HUNGARY: A PARTNER LABORATORY

The IAEA's Collaborating Centre in Nuclear Forensics with the Hungarian Academy of Sciences Centre for Energy Research (MTA EK) in Budapest, Hungary provides the Agency's Member States with a leading partner laboratory enabling coordinated research, provision of applied training, access to advisory expertise, and mentoring opportunities that have allowed the IAEA programme of nuclear forensics assistance to flourish during the past decade. The alignment of subject matter expertise with laboratory infrastructure for the response to a nuclear security event distinguishes this nuclear forensics partnership and promotes its availability within central Europe and beyond. The Centre for Energy Research is further positioned to provide specialized and effective solutions in nuclear forensics in its role as part of the IAEA Nuclear Security Support and Training Centre network. Because the IAEA, as only an assistance provider, does not conduct nuclear forensics examinations, the Centre for Energy Research provides access to a nuclear forensics laboratory that can implement IAEA guidance on the conduct of nuclear forensics examination with Member State partners as well as a hub for technical applications and innovation to advance nuclear forensics science as a preventive and response to a nuclear security event.

The Centre for Energy Research offers unique expertise and facilities as a Collaborating Centre in Nuclear Forensics. The Centre has a long-standing expertise in non-destructive analysis that is built around core competencies in high resolution gamma ray spectroscopy to include medium resolution (NaI) and high resolution (high purity germanium) detectors applied to measurements of uranium (e.g. 232U, 234U, 235U, 238U) and their decay daughters (e.g. 230Th, 226Ra, 214Bi), together with age dating of materials by gamma-spectrometry. Expertise for nuclear forensics destructive characterization using sector field inductively coupled plasma mass spectrometry allows for age dating and interrogation of trace elements (actinides, major elements, high field strength elements, rare earth elements) incorporated in nuclear and other radioactive materials that provide insight to manufacturing processes, and in turn, material origin and history. The Centre' s scanning electron microscope with its energy dispersive analyzer provides information on micro-chemistry and homogeneity at the scale of less than one micron in addition to information on textures and surfaces also bearing on provenance. Further instrumentation is also helping nuclear forensics examination like infrared spectroscopy, X-Ray diffraction or neutron tomography. The Centre's Nuclear Forensics Laboratory is further outfitted with facilities to receive and document nuclear forensics samples. Other capabilities include a hardened and secure facility for storage of seized nuclear and other radioactive material confiscated by the Hungarian authorities. Important to the capability base is a mobile capability to support law enforcement authorities in the response to a nuclear security event to include radiological surveys, evidence collection, establishment of a chain-of-custody and transport of this evidence back to the fixed laboratory.

Since the Collaborating Centre in Nuclear Forensics was established with the Centre for Energy Research in August 2016, the IAEA has embarked on a close partnership in nuclear forensics focused on implementation. Hungary has now participated in 3 IAEA Coordinated Research Projects in nuclear forensics to include studies of gamma spectroscopy as well as the development of digital systems to host a national nuclear forensics library, convened IAEA research coordination meetings, successfully piloted the IAEA Practical Introduction to Nuclear Forensics training to optimize skills of analysts in non-destructive and destructive analysis, and also served to inaugural the IAEA Residential Assignment in nuclear forensics where experts drawn from candidates from around the world are placed in the Centre's Nuclear Forensics Laboratory for a period of approximately 3 months and instructed in all facets of planning, laboratory analysis, interpretation and reporting as required by law enforcement. The Centre most recently was the set for a short IAEA video portrayal to increase awareness and understanding of a nuclear forensics examination: https://www.iaea.org/newscenter/multimedia/videos/tracing-radioactive-material-with-nuclear-forensics

Over the past ten years, the Centre for Energy Research has become a model for nuclear security development and sustainability both through its designation as an IAEA Nuclear Security Support and Training Centre as well as the first Collaborating Centre designated by the IAEA Division of Nuclear Security. Through its ability to implement IAEA guidance on nuclear forensics in the field as well as its laboratory as well as to provide a high confidence skills, knowledge and expertise platform available to the IAEA and it Member States, the Centre is well positioned for further substantive contributions to assist States in meeting their nuclear security responsibilities.

State

Hungary

Gender

Female

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