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JOINT SAMPLE ANALYSIS ON SELECTED URANIUM ORE CONCENTRATES AND NUCLEAR FORENSICS LIBRARY EXERCISE

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The IAEA's recent publication on Development of a National Nuclear Forensics Library: A System for the Identification of Nuclear or Other Radioactive Material out of Regulatory Control, reemphasizes the rationale for the development of a national nuclear forensics library (NNFL) and addresses how a country may use such a national system in investigations of nuclear and other radioactive material out of regulatory control. According to this publication, it is important for a country to determine whether a nuclear forensics sample is consistent with its domestic nuclear material holdings. As a system for the identification of nuclear or other radioactive material, a national nuclear forensics library, can facilitate interpretation of findings and assist in this determination.

Lawrence Livermore National Laboratory (LLNL), through the U.S. Department of Energy's Office of Nuclear Smuggling Detection and Deterrence (NSDD), has partnered with the Republic of Kazakhstan's Institute of Nuclear Physics (INP), the Japan Atomic Energy Agency and the Hungarian Academy of Sciences Centre for Energy Research (MTA-EK) on a joint sample analysis involving a set of uranium ore concentrate (UOC) samples. The sample set contained five UOC powder samples of known origin and a sixth sample of unknown origin (blind sample). The objective of the joint sample analysis exercise was to characterize the uranium ore concentrate samples according to a well-developed analytical plan, and use the measured material characteristics to populate a nuclear forensics library. This library is then used to establish potential links between the blind sample and the samples of known origin. The four participating laboratories compared data and analysis methods, and shared best practices on the implementation of a national nuclear forensics library.

As the largest single producer of uranium in the world, Kazakhstan has a targeted interest in understanding the measurable characteristics associated with the uranium ore concentrate (UOC) it produces. The planned Kazakhstan NNFL will include data resources and expertise on the wide range of nuclear and radioactive materials present in Kazakhstan. UOC is signature-rich and is therefore a good material to target for inclusion in an NNFL. The first data resource for the Kazakhstan NNFL will therefore be UOC.

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