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METROLOGICAL AREAS OF IMPORTANCE FOR IAEA SAFEGUARDS: PRESENT AND FUTURE ROLE OF CETAMA

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Safeguards inspectors from the International Atomic Energy Agency (IAEA) collect around 1 000 inspection samples annually as part of their verification activities. Two dedicated Safeguards Analytical Laboratories (SAL) in Seibersdorf, Austria perform the analyses of inspection samples: the Environmental Sample and Nuclear Material laboratories. A third "On-Site Laboratory" located in Japan is jointly shared between the IAEA and the Japanese State Authority for the analysis of samples taken from the Rokkasho Reprocessing Plant. SAL are further supported by a network of 24 external laboratories (NWAL) located in 11 Member States and the European Commission. The NWAL provide a broad range of services to the IAEA, but they primarily support inspection sample analysis, especially for environmental samples. The IAEA directs a number of measures to assure the quality of analytical services from its own laboratories as well as from the NWAL. Metrological areas of importance to the IAEA from the CETAMA include the provision of certified reference materials (CRM), interlaboratory comparisons (ILC) and assistance and expert advice through the various working groups in the nuclear field. Aided by the French Support Programme to IAEA Safeguards, the CETAMA has provided critical CRM and ILC services to IAEA Safeguards for decades, and has been a key partner in helping assure the quality of results from SAL and the NWAL. Over the past 20 years the number of reference material suppliers to the nuclear community has declined, therefore the role of the CETAMA to nuclear community at large, and IAEA Safeguards specifically, cannot be understated. Although the continuation of its current catelog of CRM and ILC is extremely important, new demands on the IAEA may require a greater range of CRM and services from the CETAMA. For example, the need for new 239-Pu enriched plutonium metal CRM will continue to grow as existing supplies diminish and expertise declines. Additionally, more in-depth characterization of uranium ore concentrate samples (e.g., for metallic and non-metallic impurities at the trace level) and UF_6 samples (e.g., for the minor isotopes of uranium at the part per million level) highlight the importance of the commutability of reference materials in understanding the measurement uncertainty in inspection samples with complex matrices. Performance testing through interlaboratory comparisons with nuclear materials is also an extremely important quality control measure for SAL and the NWAL, and the current EQRAIN programmes (EQRAIN U, EQRAIN Pu, EQRAIN U+PU, EQRAIN Traces in U, EQRAIN CHONS and EQRAIN IONS) should be continued, and perhaps expanded through the CETAMA – IAEA partnership.