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Technical Review of Operator's Destructive Analyses at the Rokkasho Reprocessing Plant: Strengthening the Transparency of the Operator's Measurement System

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The Rokkasho Reprocessing Plant is a large-scale nuclear facility in Japan. For the purposes of process control, product management and nuclear material accountancy for safeguards purposes, the laboratory analyses thousands of samples from various process streams and with a multitude of matrices. Transparency of operational procedures, quality control measures and sample analytical results among the facility operator and State and international safeguards authorities are required to assess the facility operator's measurement system, and thus to assure an effective safeguards approach. The facility operator, Japan Nuclear Fuel, Limited (JNFL), is engaged in continuous improvement of its nuclear material analyses. For the declarations to the inspectorates, it is important that JNFL and the safeguards authorities are able to confirm that the analytical methods used by JNFL are reliable and meet the latest International Target Values. Since 2012, JNFL, the IAEA and the State's System of Accounting and Control (SSAC) have carried out several technical reviews of the destructive analysis (DA) processes as a means of strengthening the transparency of the DA measurement systems. The goal of the DA technical reviews is to (1) assess past commitments of the JNFL plan for analytical improvement, (2) review the JNFL Quality System by means of documentation reviews and in-field demonstrations, and (3) review the analytical performance of the JNFL laboratory through its own results or from inter-laboratory comparison exercises. Throughout this process, subject-matter experts from all organizations met JNFL laboratory staff and discussed analytical concerns and solutions. The outcome of these technical reviews was a series of recommendations to JNFL for strengthening its plan for continuous improvement. This paper presents the methodology of the DA technical reviews, the communication scheme and some examples of the outcome for JNFL to improve its DA methods and analytical performance.

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