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Feedback of EQRAIN Uranium and Plutonium Analysis Proficiency Tests for the Evaluation of Method Performance

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Analytical approaches are validated by demonstrating that they are suitable for their intended objectives and meet particular requirements of each unit.

In this context of analytical validation, included in its main mission of promotion of good analytical practices, the CEA's Committee for the Establishment of Analysis Method (CETAMA) has implemented the program known as "quality Assessment of Analysis Results in the Nuclear Industry" (EQRAIN) since 1987. This program has organized regularly interlaboratory comparisons concerning the elemental analysis of uranyl and plutonium nitrate solutions.

The EQRAIN U and Pu interlaboratory comparisons are basically proficiency tests although they are not performed directly for the purpose of qualifying the laboratories. They are closely related to nuclear material accountancy in the fuel cycle and are relatively complementary of the IMEP program organized by IRMM and the NML IAEA's program.

The specifications of a new comparison are defined at meetings of uranium or plutonium working group. The preparation step, including fabrication, packaging and reference values determination are conducted by the nuclear material laboratory (LAMMAN) located in the Atalante facility of CEA Marcoule (DRCP/SERA/LAMM). For each ampoules analyzed, the interpretation of the results is based on the ISO 13528 and ISO 5725 standards.

This paper will present the compiled results of the last five EQRAIN U and Pu comparisons. It provides an interesting opportunity to discern the trends in this type of analysis and to compare the accuracy and reproducibility of the main methods employed either material balance inspection methods or process control methods. This statistic data processing highlights the progress of laboratories in evaluating their measurement uncertainties.

This intrinsic performance of measurement methods evaluation is compared to the measurement uncertainties values established by IAEA for nuclear material balance (ITV2010).

Country or International Organization

France

Primary author: ROUDIL, Danièle (CEA/DEN/DRCP/CETAMA)

Co-authors: RUAS, Alexandre (CEA/DEN/DRCP/SERA/LAMM); TUFFERY, Bruno (CEA/DEN/DRCP/SERA/LAMM); RIGAUX, Corinne (CEA/DEN/DRCP/CETAMA); RIVIER, Cédric (CEA/DEN/DRCP/CETAMA); SOLINHAC, Isabelle (DEN/DRCP/SERA/LAMM)

Presenter: ROUDIL, Danièle (CEA/DEN/DRCP/CETAMA)

