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Technical support from the IAEA for improvement of operator's analytical quality for Safeguards

The Plutonium Fuel Development Center of Japan Atomic Energy Agency (JAEA-PFDC) received Japan's first plutonium in 1966 and commenced research to develop plutonium fuel as a key objective of the Japanese nuclear fuel cycle. Since then fundamental research with plutonium-bearing materials, and the development and fabrication of mixed uranium-plutonium oxide fuels, has been carried out.
When the new MOX fuel fabrication facility has started its operation and handling of plutonium was increased, the IAEA recommended JAEA-PFDC to improve the accountancy system. JAEA-PFDC conducted a series of discussions with IAEA measurement experts to identify more appropriate measurement methods and analytical instrumentation for its accountancy system. Isotope dilution mass spectrometry (IDMS) was identified as a good solution and was implemented in 1996. This method significantly reduced the Operator-Inspector plutonium bias at JAEA-PFDC.
It is essential that the Operator's measurement quality be continually reviewed and improved for effective and efficient implementation of international Safeguards. In this context, and recognizing the excellent technical cooperation with IAEA measurement experts, JAEA-PFDC has continually worked to improve its measurement system.
This paper will present examples of continual measurement improvement by JAEA-PFDC, and the benefit and effectiveness of technical support from IAEA towards this goal. One such example is the project to introduce large-size dried spikes made from Japanese plutonium source material to secure a lasting accountancy analysis. Assistance from the IAEA and its network of analytical laboratories for the characterization of the Japanese plutonium standard material was an essential part of the success of this project. Another example is participation in the IAEA nuclear material round robin, which provides external verification of JAEA-PFDC measurement quality. Finally, JAEA-PFDC is an accredited laboratory (ISO 17025) for the IDMS method, and as such it is mandated to continually improve the quality and reliability of its measurement results for accountancy.

Which "Key Question" does your Abstract address?

SGI1.1

Which alternative "Key Question" does your Abstract address? (if any)

SGI1.3

Topics

SGI1

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