

Evaluation of low-level environmental sampling capabilities at Brazilian and Argentine laboratories by ABACC

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The Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC) with assistance from the US Department of Energy began a program in June 1998 to evaluate environmental sampling capabilities at laboratories in Argentina and Brazil. The program has included training in both South America and the US, as well as an evaluation exercise using low-level samples prepared with precisely known amounts of uranium isotopic standards. Results from this exercise were reported at the INMM 41st Annual Meeting. Evaluation of data from this exercise showed that the ABACC laboratories had made progress in developing the capability to determine both the quantity and isotopic composition of uranium at levels expected in typical environmental samples. However, in some cases it was evident that uranium contamination was seriously affecting the results. These results highlighted the importance of contamination control in environmental analyses where the uranium concentration in the sample is often many times less than that found in the ambient environment (i.e., the sample preparation and analysis laboratories). The next stage in evaluating ABACC environmental sampling capabilities involved implementation of stringent contamination control practices followed by a quantitative assessment of the uranium blank at each stage of the analysis process. Isotope dilution mass spectrometry (IDMS), using a ²³³U spike from New Brunswick Laboratory, was used to measure uranium content. Each of the ABACC laboratories performed uranium blank measurements for key stages in the sample preparation and analysis procedure, including a full process blank and a reagent blank. In addition to quantitative blank determinations, ABACC has also initiated a new round of measurements on a standard reference material (NIST SRM 1547, Peach Leaves) with an uncertified uranium concentration of 0.015 µg/g. This SRM effectively simulates an actual environmental sample and provides a challenging test of low-level analysis capabilities. The results of these exercises will be given in this presentation.

Biography of the speaker

Dr. Guidicini is a member of the Secretariat of the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC). The ABACC is responsible for implementing international safeguards on all nuclear materials in all nuclear activities in Argentina and Brazil. Specifically, she is an operations officer responsible for evaluating and strengthening all inspection procedures and activities and coordinating training activities for ABACC inspectors. Dr. Guidicini holds a Ph.D. in nuclear engineering.