

Close-out of FY 00 AOP Milestone 6.7.1(6.6a)

T.H. Gould

July 28, 2000

U.S. Department of Energy

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Plutonium Immobilization Project

July 28, 2000

Mr. William Danker, NN-60
Immobilization Project Manager
Office of Fissile Materials Disposition
U. S. Department of Energy
1000 Independence Ave., S. W.
Washington, DC 20585

Dear Mr. ^{Bill}Danker:

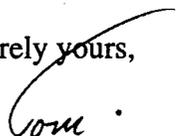
Subject: Close-out of FY 00 AOP Milestone 6.7.1(6.6a)

Reference: Letter Thomas Gould to William Danker, "Implementation of NN-60 Guidance from April Project Review", Part I, May 23, 2000.

This letter and attached report satisfy FY 00 Milestone 6.7.1 (6.6a, D&T Plan) Preliminary Can MC&A requirements and potential analytical techniques determination.

If you or your staff have any questions regarding this submission, please contact me or Paul Maddux.

Sincerely yours,


Thomas H. Gould, Manager
Plutonium Immobilization Project

cc: Andre Cygelman, NN-62
Trieu Truong, NN-62
Paul Maddux, WSRC
Al Disabatino, LLNL
Lee MacLean, LLNL
DCC

WESTINGHOUSE SAVANNAH RIVER COMPANY
INTEROFFICE MEMORANDUM



SRT-IES-2000-00052

To: Doug Melton, 703-45A

July 25, 2000

From: Lee ReFalo, 305-A

Subject: Preliminary Can MC&A Requirements and Potential Analytical Techniques Determination Summary (U)

Summary

Several types of measurements & equipment were reviewed for the Can MC&A design basis. The measurements & equipment selected were included in the draft System Design Description. Based on the SDD review, the original gamma measurement equipment was changed from a CZT based system to a HPGE system. The current design includes dry calorimeters, HPGE gamma detection system, and scales. This document will briefly discuss the selection of each instrument.

Calorimeter

Dry calorimetry is a proven technology at the SRS and was selected to provide the best measurement on the final product. Neutron techniques were considered; however, it is unlikely the facility MC&A balance would meet DOE O 474 (2% error) with the neutron measurement error.

Error associated with calorimeter measurements is normally requested to be 0.25% RSD. However, this will be a challenge in the PIP case due to the large container size relative to its heat output. Estimating the error with neutron measurements in the 3% to 10% range still gives calorimetry an approximate order of magnitude reduction in error.

Gamma Measurements

Gamma measurements are required in combination with calorimetry (and neutron measurements) to provide a complete mass accountancy. Initially, the proposed system was based on a CZT detector. CZT detectors have lower resolution than HPGE detectors. It was believed the best isotopics measurement would be obtained from the blended, batched material prior to puck can loading and this information would be used in the final material analysis. However, the detection system was changed to a HPGE system based on the SDD review.

An additional benefit of the gamma system will be its potential ability to 'count' the number of pucks in a can. This will be accomplished through a vertical scan of the puck can.

Scales

Scales are normally included in the NDA scheme. While they are not required for MC&A material accountability, they do provide valuable information on the mass of the loaded puck can.

Any questions may be directed to Lee ReFalo, 803-725-4473.

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