

MEMORANDUM TO: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield

FROM: William D.Travers
Executive Director for Operations

SUBJECT: PROJECT SAPPHIRE MATERIAL DISCREPANCY

The purpose of this memorandum is to update the Commission on the status of the processing of Project Sapphire high enriched uranium (HEU) at BWX Technologies (BWXT) in Lynchburg, Virginia. In a memorandum to the Commission dated October 30, 1996, the staff identified an apparent discrepancy between the amount of material declared to have been received and the amount actually measured following initial processing at BWXT. The HEU, which was removed from Kazakhstan by DOE under a cooperative program, involved an estimated 580 kilograms of HEU in several material forms. However, the apparent discrepancy involved only one particular material type, uranium-beryllium alloy scrap, that could not be representatively sampled and analyzed for uranium and uranium-235 content due to its heterogenous nature. Accountability measurements for this type of material must be based on measurements made after the dissolution of the uranium. BWXT initiated processing of this material type in July 1996 but was forced to curtail processing after approximately 24 percent of the estimated 232 kilograms was processed due to a safety concern. Based on that recovery data, it appeared that there was an approximate 27 percent negative bias between the recovered and as-received measurements. As noted in the 1996 memorandum, this apparent discrepancy attracted some media interest.

BWXT has since resolved the safety issue and resumed processing the final 190+ kilograms of uranium-235 in the uranium-beryllium alloy scrap. As of mid-November 1999, BWXT had processed approximately 50 percent of the 140 material batches. Measurement results after the material dissolution stage continue to show an apparent negative bias on the order of 23 percent relative to the DOE declared values. This is consistent with similar verification results observed during the initial material processing as described in the 1996 memorandum and data analyzed in a Safeguards Inspection Report No. 97-203 dated July 1997 in which the NRC inspection staff predicted a total shortfall of about 65 kilograms uranium-235 from this material recovery campaign.

CONTACT: Charles W. Emeigh
(301) 415-7836

NRC and DOE staff continue to converse on the probable reasons for the discrepancy on this material type. Of note is the fact that the DOE measurements on this material, as it was extracted from Kazakhstan, were not of high quality due to an inability to obtain a representative sample of this heterogenous material and the lack of representative non-destructive assay standards. NRC and DOE will monitor the completion of the Sapphire material processing and perform additional independent verification measurements.

Inspectors for the IAEA are at BWXT this month to inspect the downblending of Project Sapphire material. The staff does not anticipate any adverse impact from this discrepancy because IAEA safeguards only apply to the downblending of the high enriched uranium, which is not impacted by the accounting discrepancy.

A copy of the October 30, 1996, memorandum is attached for reference.

Attachment: EDO Memorandum of 10/30/96,
"Media Article on Project Sapphire
Discrepancies."

cc: SECY
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