Savannah River Site Watch

SRS Watch – Draft Observations and Comments on
SRS *Nuclear Materials Management Plan, FY 2016-2030*

March 22, 2017

The FY 2016 and FY 2015 "Nuclear Materials Management Plan" were obtained via a Freedom of Information Act (FOIA) request on November 2, 2016 to DOE's Savannah River Site. The FOIA response cover letter and the two "Plans" are posted on the SRS Watch website:

http://www.srswatch.org/uploads/2/7/5/8/27584045/foia_nuclear_material_management_plan_2015_2016.pdf

The "Plans" prepared by Savannah River Nuclear Solutions and Savannah River National Lab for DOE, so will reflect their interests. No public input was solicited at any step in the process of preparing the document. As plutonium and waste import and processing is generally know, there does not appear to be anything of a highly unusual nature in the text that is not blacked out. A FOIA appeal of justification for blacking out certain text in the plans could be filed, but we will likely not given the effort involved.

The Plan only briefly mentions the NNSA MOX project and thus does not discuss future plans for the MOX plant or processing of plutonium in it.

Initial comments and observations on the FY2016 Plan:

Section 1.1 Spent Nuclear Fuel, Target Material, and Plutonium Receipts

The Plan affirms that spent fuel will continue to be received in the 2016-2030 time period, from domestic and foreign research reactors.

The liquid high-level waste (TRM) from Canada was not received in FY 2016, so the plan is out of date.

Section 1.2 SNF, Plutonium, ????

The Plan states that about 40 metric tons of uranium will be processed through H-Canyon from FY 2018-2024. This is to be downblended to 4.95% uranium to LEU for use in TVA reactors.

The Plan mentions the beginning of downblending of plutonium (6 MT) stored in K-Area, for disposal in WIPP, but there is no mention of expanding downblending capacity. That could be mentioned in a blacked-out paragraph.

Figure 1.4-1 Nuclear Materials Planning Roadmap (page 9)

Much information has been excluded, without proper justification for doing so. Of particular interest is the timeline at the top of the page, in which years beyond FY2024 have been blacked out.

Much of the information is unreadable and some use of initialism unexplained – for example "AOA" and "HCO."

Section 2.0 SUMMARY INVENTORY

The "Nuclear Weapons Complex directives" are mentioned as they pertain to tritium processing at SRS, but no mention is made if tritium goes to deployed weapons and reserve weapons. It is the large reserve weapon stockpile – on the order of 4000 weapons – that places great and unjustified demand on tritium supply. Those weapons are evidently kept fully charged with tritium, for no reason.

Section 2.3 Inventory Quantities

The amounts and locations of separated stored materials in the Nuclear Materials Inventory assessment" is classified. The amounts of special nuclear materials in storage in the KAMS facility at SRS holds little security concern and, in the public interest, those figures should be declassified.

Section 3.0 MATERIAL DEMAND AND RETENTION

Pertaining to mark 18A targets at SRS, according to DOE document "PRELIMINARY MARK-18A (Mk-18A) TARGET MATERIAL RECOVERY PROGRAM PRODUCT ACCEPTANCE CRITERIA," – Oak Ridge National Lab, September 2016 - http://info.ornl.gov/sites/publications/files/Pub70188.pdf:

> The U.S. Department of Energy (DOE) manages an inventory of materials that contains a range of long-lived radioactive isotopes that were produced from the 1960s through the 1980s by irradiating targets in production nuclear reactors at the Savannah River Site (SRS). One reactor was operated in a high-flux mode to produce heavy isotopes for defense purposes, DOE programmatic use, scientific research, and industrial and medical applications. In this reactor, eighty-six Mk-18A (Mk-18A) targets were subjected to long-term high neutron fluxes 47 years ago. Twentyone targets of these were processed to recover 244Pu, heavy curium (i.e., curium rich in 246-248Cm), and 252Cf. The plutonium fraction, which was rich in 244Pu, was electromagnetically enriched in the Oak Ridge National Laboratory (ORNL) calutrons to produce gram quantities of 244Pu. This high-purity 244Pu was portioned out to scientists for basic research and for nuclear nonproliferation safeguards programs. The recovered tails (designated as FP-33) contain 244Pu isotopic purities below 20% and are stored at ORNL. The processing of these 21 Mk-18A targets provided the supply of 244Pu and heavy curium in use today. The remaining 65 unprocessed targets are currently

in a storage pool at SRS; they contain the world's remaining supply of unseparated 244Pu and heavy curium.
Plutonium-244 is not present in nature and is not produced in defense production or the commercial market place. Its characteristics make it irreplaceable for quantitative nuclear forensic analysis. It provides the capability to perform high-precision analysis in support of U.S. nonproliferation objectives. In addition to the 244Pu, the heavy curium in the Mk-18A targets is an attractive long-term feedstock for the production of 252Cf and other heavy elements. Although alternative feedstocks for heavy element production are available, they are less attractive than heavy curium contained in the Mk-18A targets.

Section 3.3 Nuclear Materials Shortfalls

If tritium is not loaded into "reserve" weapons there could be no need to start irradiation of tritium rods in a second reactor – Sequoyah – operated by the Tennessee Valley Authority (TVA). DOE must review the option not to load tritium into reservoirs in reserve weapons.

Section 4.1 Material Additions (Receipts)

Unclear what "tankers" containing uranium solutions supplied by TVA will be shipped to SRS, for downblending with HEU.

The Plan confirms receipt in FY2016 of "gap" plutonium from Switzerland, Germany and Japan. But no mention is made of why some of those materials did not go into plutonium stockpile in the United Kingdom and France. The bulk of the plutonium from Japan was of UK origin.

DOE stated in the December 2015 "ENVIRONMENTAL ASSESSMENT FOR GAP MATERIAL PLUTONIUM – TRANSPORT, RECEIPT, AND PROCESSING" (http://www.srs.gov/general/pubs/envbul/documents/EA-2024-FEA-2015.pdf) that gap plutonium received at SRS would be disposed of as waste – see footnote on page 6: "Gap plutonium would not meet MOX fuel fabrication acceptance criteria and, therefore, would not be considered for disposition via the MOX fuel disposition."

Section 4.2 Material Removals (Shipping)

E-Area currently stores downblended plutonium packaged before WIPP was closed in February 2014. That material is likely the first SRS material to be transported to WIPP now that the facility has reopened. The plutonium is packaged in Pipe Overpack Containers (POCs), holding about 150 grams of plutonium in each POC (then placed inside a drum). The downblending now taking place in the single glovebox in the K-Area is into "Criticality Control Overpacks" (CCOs), into which about 350 grams of downblended plutonium are placed.

Section 5.3 H-Area (H-Canyon and HB-Line)

H-Canyon, operated by SRNL, employs around 800 people. This employment level is a main reason for finding reprocessing and other programs for the H-Area.

Section 5.5 SRNL

Does the blacked-out paragraph mention the R&D related to the processing of graphite spent fuel from Germany? (That proposal teeters on being abandoned as the German Bundestag is discussing a draft high-level waste management law that would preclude export of the materials.)

Section 5.6 Tritium

This section mentions the various tritium-handling facilities at SRS, something not often mentioned by DOE.

How is the waste from the Tritium-Producing Burning Absorbable Rods (TPBARs) managed once the tritium is extracted at SRS in the Tritium Extraction Facility (TEF)? The TPBARs are irradiated I n TVA's watts Bar 1 reactor and shipped to SRS. As the rods have been irradiated in a reactor they are high-level material and the by-product waste would be HLW.

Section 6.0 STATUS OF PLANS FOR DISPOSITION OF MATERIALS

How will unirradiated FFTF fresh fuel be placed in WIPP?

Section 7.0 RESTRICTED USE MATERIALS

DOE has said that "several tons" of plutonium stored in KAMS are under IAEA surveillance. The material is evidently in a marked area, has cameras observing it and IAEA officials periodically visit SRS to check on the material.

Section 7.1 Foreign Obligations

Any HEU removed from foreign-obligated spent fuel could be downblended to LEU but not used as fuel to produce weapons tritium in TVA's Watts Bar 1 reactor.

Section 7.3 Materials Associated with Declarations

The mentioned presidential declarations need to be researched as it is unclear what these materials are at SRS.

Section 10.0 ISSUES

DOE admits that there is a "lack of an assigned disposition path" for some spent fuel and plutonium.

Section 11.0 ACCOMPLISHMENTS

A.h. Decladding likely refers to plutonium materials received from Japan, so called "Fast Critical Assemblies." Will Japan pay for 100% of this cost?

A.j. Shipment of plutonium from the ARIES project at Los Alamos – preparation of plutonium oxide from pits – likely is still suspended.

A.m. Termination of foreign obligation might allow separated HEU, downblended to HEU, to be used for tritium production.

Part D. - Outlines many of the NNSA's tritium-related activities that make SRS a nuclear weapons site.

Overall, the Plan fails to mention both the number of employees in all the activities discussed in the Plan and the associated budgets. Are some of the material management activities being pursued for job and budget reasons and not nuclear non-proliferation (as we have pointed out before)?

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