



The Secretary of Energy
Washington, DC 20585

September 1, 2004

The Honorable John T. Conway
Chairman, Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, D.C. 20004-2941

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Dear Mr. Chairman:

We are pleased to submit to the Defense Nuclear Facilities Safety Board the enclosed report concerning decommissioning of our Savannah River Site F-Canyon facility. This report was mandated by Congress in the National Defense Authorization Acts for Fiscal Years 2001 and 2004. Subsection (b) of section 3137 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106-398), as amended by subsection (b) of section 3115 of the National Defense Authorization Act for Fiscal Year 2004 (Public Law 108-136), requires that, prior to expending any funds for the purpose of commencing decommissioning F-Canyon, the Secretary of Energy submit this report to the Committee on Armed Services of the Senate, the Committee on Armed Services of the House of Representatives, and the Board.

F-Canyon began operations in the early 1950s for the primary purpose of providing strategic isotopes for nuclear weapons in support of the Nation's defense programs. More recently, the facility was operated to stabilize legacy Cold War nuclear materials for safe long-term storage. All chemical separation activities in F-Canyon were completed in March 2002, and the last remaining material in the facility that required stabilization was removed from the facility in January 2003. Since November of last year F-Canyon has been undergoing deactivation, which includes such activities as removal of hazardous materials, draining and flushing tanks and piping, and de-energizing nonessential systems. Significant progress has been made in deactivation, and since there is no need for the capabilities of F-Canyon in the future, the Department will soon commence decommissioning activities in order to permanently retire F-Canyon from service.

If you have any further questions regarding this report, please contact me or Mr. Rick A. Dearborn, Assistant Secretary for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

A handwritten signature in black ink that reads "Spencer Abraham".

Spencer Abraham

Enclosure



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DEFENSE SAFETY BOARD

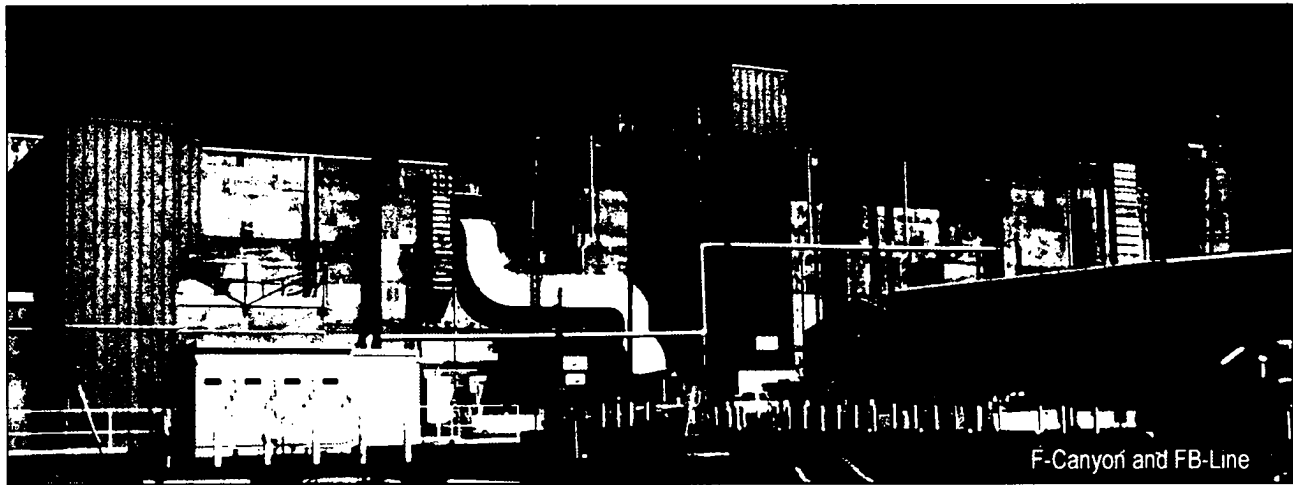
**Report to the Committee on Armed Services of
the Senate and the Committee on Armed Services
of the House of Representatives, and the
Defense Nuclear Facilities Safety Board,
Concerning Decommissioning of the
Savannah River Site F-Canyon**



Department of Energy

July 2004

**Report to the Committee on Armed Services of the Senate and the Committee on Armed Services of the House of Representatives, and the Defense Nuclear Facilities Safety Board,
Concerning Decommissioning of the Savannah River Site F-Canyon**



Purpose

Subsection (b) of section 3137 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106-398), as amended by subsection (b) of section 3115 of the National Defense Authorization Act for Fiscal Year 2004 (Public Law 108-136), requires that prior to decommissioning F-Canyon the Secretary of Energy submit a report to the Committee on Armed Services of the Senate, the Committee on Armed Services of the House of Representatives, and the Defense Nuclear Facilities Safety Board. That report is to provide: 1) an assessment whether or not all materials present in F-Canyon have been safely stabilized; 2) an assessment whether or not the fissile material disposition requirements applicable to F-Canyon can be met through use of H-Canyon; and 3) an identification of any such requirement that cannot be met using H-Canyon, the reasons why it cannot be met, and a description of the alternative capability needed to meet the requirement. This report was prepared to satisfy the requirements of the subject legislation.

The full text of the subject legislation is provided below.

No amounts authorized to be appropriated or otherwise made available for the Department of Energy by this or any other Act may be obligated or expended for purposes of commencing the decommissioning of the F-canyon facility at the Savannah River Site until the Secretary of Energy submits to the Committee on Armed Services of the Senate and the Committee on Armed Services of the House of Representatives, and the Defense Nuclear Facilities Safety Board, a report setting forth—

(1) an assessment whether or not all materials present in the F-canyon facility as of the date of the report that required stabilization have been safely stabilized as of that date;

(2) an assessment whether or not the requirements applicable to the F-canyon facility to meet the future needs of the United States for fissile materials disposition can be met through full use of the H-canyon facility at the Savannah River Site; and

(3) if it appears that one or more of the requirements described in paragraph (2) cannot be met through full use of the H-canyon facility—

(A) an identification by the Secretary of each such requirement that cannot be met through full use of the H-canyon facility; and

(B) for each requirement so identified, the reasons why such requirement cannot be met through full use of the H-canyon facility and a description of the alternative capability for fissile materials disposition that is needed to meet such requirement.

Background

The Atomic Energy Commission established the Savannah River Site (SRS) in the early 1950s to produce special strategic isotopes such as plutonium-239 for nuclear weapons in support of the Nation's Defense Programs. The production cycle at the SRS involved the fabrication of metal fuel and target assemblies for irradiation in the Site's nuclear reactors, followed by chemical processing and recovery of the radioisotopes into solid forms.

Two chemical processing facilities, called "canyons," were constructed at the SRS, one located in F Area and the other in H Area. Both facilities began operations in the early 1950s for the primary purpose of providing strategic isotopes such as plutonium-239 using a chemical separation process known as PUREX (Plutonium-URanium EXtraction). In the late 1950s, the equipment in F-Canyon was upgraded to achieve greater capacities. Plutonium-239 and uranium-238 were recovered by dissolving aluminum-based irradiated fuel slugs or fuel rods from the SRS production reactors and other test and research reactors. In 1959, H-Canyon was modified to recover uranium-235 from aluminum-based enriched uranium fuel rods from site reactors and other domestic and foreign research reactors. In each facility, nuclear materials of interest were separated from waste and by-products then transferred as solutions to the associated finishing facilities, called FB-Line and HB-Line, for conversion to a final product form of metals in FB-Line and oxides in HB-Line. In addition to the finished product, annual operation of each canyon and its associated finishing facility typically generated several hundred thousand gallons of liquid waste, several tens of thousands of cubic feet of low level solid waste, and several thousand cubic feet of transuranic solid waste.

World events during the late 1980s and early 1990s resulted in the end of the Cold War and a reduction in the demand for nuclear weapons, and in 1992 then-Secretary of Energy Watkins issued a decision to phase out canyon processing. As a result, a number of nuclear materials at SRS and other sites were essentially left in the processing "pipeline" and posed potential health, safety, or environmental vulnerabilities because they were in forms, or stored under conditions, not suitable for safe long-term storage. These materials were identified by the Department in complex-wide vulnerability studies and also by the Defense Nuclear Facilities Safety Board (DNFSB) in its Recommendations 94-1 and 2000-1 to the Department.

Subsequent to completion of appropriate National Environmental Policy Act (NEPA) review, portions of the canyon facilities resumed operating in 1995 to begin processing nuclear materials to address the potential health, safety, and environmental vulnerabilities. Both F- and H-Canyon have been operated over the past several years to stabilize nuclear materials in accordance with the Department's Implementation Plans for DNFSB Recommendations 94-1 and 2000-1. Examples of material stabilized through F-Canyon since 1995 include over 80,000 gallons of plutonium solutions left in-situ within the F-Canyon facility; approximately 15,900 targets left in-situ in the reactor basins; approximately 200 Taiwan Research Reactor Fuels and Experimental Breeder Reactor II Fuels showing signs of degradation; and over 500 containers of plutonium residues from the Rocky Flats Environmental Technology Site.

All nuclear material stabilization activities that required the chemical separation capabilities of F-Canyon were completed in March 2002, and the facility is now deinventoried. The process tanks have been flushed to remove residual quantities of the isotopes that remained, the bulk chemicals used in the processing operations have been deinventoried from the facility, the depleted uranium solution has been consolidated into tanks outside the F-Canyon awaiting shipment offsite for disposition, and the solvents used in the processing operations have been decontaminated and consolidated in tanks outside the F-Canyon awaiting shipment offsite for disposition.

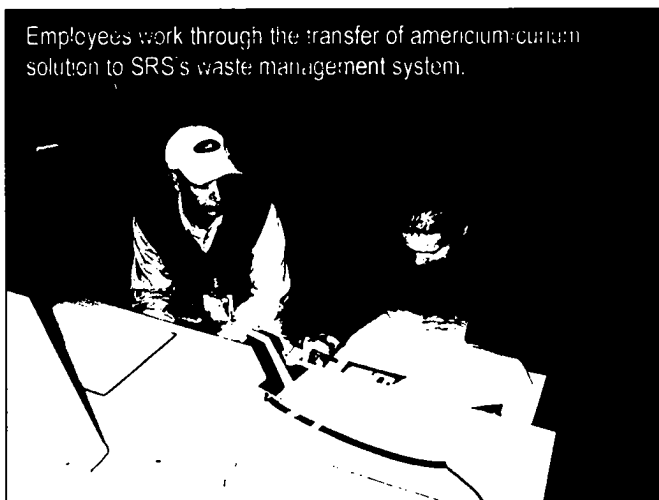


Information Required by the Subject Legislation

The items required by the legislation to be addressed are repeated individually below, followed by the Department's response.

(1) an assessment whether or not all materials present in the F-canyon facility as of the date of the report that required stabilization have been safely stabilized as of that date

All materials in F-Canyon that required stabilization have been safely stabilized. Stabilization of the first such material in the facility, 80,000 gallons of plutonium-239 solution, was completed in April 1996 by converting the solution to a stable metal form. PUREX processing operations were completed in F-Canyon in March 2002. The last material in F-Canyon that required stabilization was 3,800 gallons of americium/curium solution. That solution was removed from the facility in January 2003.



Employees work through the transfer of americium/curium solution to SRS's waste management system.

(2) an assessment whether or not the requirements applicable to the F-canyon facility to meet the future needs of the United States for fissile materials disposition can be met through full use of the H-canyon facility at the Savannah River Site

There are no fissile material disposition requirements applicable to the F-Canyon facility. As mandated by the National Defense Authorization Act for Fiscal Year 2002, the National Nuclear Security Administration (NNSA) completed an analysis, as documented in "Report to Congress: Disposition of Surplus Plutonium at the Savannah River Site," dated February 15, 2002, that included an evaluation of the feasibility of using F-Canyon in its future material disposition activities, and concluded that use of the facility was not an economical option. Also, the Department spent several years evaluating nuclear material inventories, their potential disposition paths, and their potential need for canyon processing. The results of those efforts are documented in "Savannah River Site Canyons Nuclear Material Identification Study," dated February 2001, which was prepared by the Department of Energy's Office of Environmental Management. That study concluded that none of the materials in the Department of Energy's complex that potentially required canyon processing for disposition required chemical separation in F-Canyon, and clearly indicated that H-Canyon provides all the capabilities that could be needed for any of the materials in the complex potentially requiring canyon processing for disposition. Based on all the reviews and evaluations regarding future needs for facility capabilities that have been performed by both NNSA and EM, it has been concluded that the operation of F-Canyon is not required for current or future stabilization, disposition,

or Defense Programs needs, and no new missions or requirements for the use of F-Canyon have since been identified. It is also important to note that F-Canyon itself does not disposition material, since processing in the canyon results in relatively pure plutonium and depleted uranium. These products from processing then require disposition.

(3) If it appears that one or more of the requirements described in paragraph (2) cannot be met through full use of the H-canyon facility—(A) an identification by the Secretary of each such requirement that cannot be met through full use of the H-canyon facility; and (B) for each requirement so identified, the reasons why such requirement cannot be met through full use of the H-canyon facility and a description of the alternative capability for fissile materials disposition that is needed to meet such requirement

As stated above, there are no fissile material disposition requirements applicable to F-Canyon. Therefore, there are no such requirements that would need to be met through use of H-Canyon. However, also as stated above, all future canyon processing needs can be met using only H-Canyon.

Summary

- All materials present in F-Canyon that required stabilization have been safely stabilized
- There are no fissile materials disposition requirements applicable to F-Canyon to meet future needs of the United States
- All future canyon processing needs can be met through use of H-Canyon
- The F-Canyon facility has concluded its mission

