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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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March 18, 2009

Dr. Inés R. Triay  
Acting Assistant Secretary for Environmental Management  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0113

Dear Dr. Triay:

The staff of the Defense Nuclear Facilities Safety Board (Board) recently performed a review of the maintenance program at the high-level waste (HLW) Tank Farms at the Savannah River Site (SRS). The review focused on the maintenance of selected safety equipment, as well as contractor and Department of Energy (DOE) oversight of the maintenance program. Overall, the staff found that safety-class and safety-significant systems and equipment in the HLW Tank Farms are being adequately maintained to perform their intended safety functions.

The enclosed report on maintenance in the HLW Tank Farms is provided for your information and use as appropriate. The Board would like to highlight two observations from this report:

DOE Order 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*, requires that DOE review and approve a contractor's Maintenance Implementation Plan (MIP) every 2 years. The last DOE review letter approving the Tank Farms contractor's MIP was dated February 29, 2000. A new contractor assumed the Management and Operating contract at SRS in August 2008, and has responsibility for the site-wide MIP. This would be an ideal time for DOE to start implementing a 2-year review cycle of the MIP as required by DOE Order 433.1A.

The Tank Farms contractor has not compared the MIP with acceptable program elements contained in the *Nuclear Facility Maintenance Program Guide for Use with DOE O 433.1* (DOE Guide 433.1-1) to ensure that its approach provides an equivalent or better level of performance. Although compliance with the Guide is not a formal requirement, a comparison between the Guide and the contractor's MIP may identify areas of improvement for the maintenance program.

The Board notes that the Tank Farms MIP is derived from broader site-wide documents. The noted deficiencies likely extend to other site programs. Furthermore, in a letter to the

Assistant Secretary for Environmental Management dated September 17, 2008, the Board noted similar deficiencies at the Hanford Tank Farms. The Board urges you to assess the extent to which these deficiencies exist at other sites under your cognizance.

Sincerely,

A handwritten signature in black ink, appearing to read "A. J. Eggenberger". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

A. J. Eggenberger  
Chairman

Enclosure

c: Mr. Jeffery M. Allison  
Mr. Mark B. Whitaker, Jr.

# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

## Staff Issue Report

February 17, 2009

**MEMORANDUM FOR:** T. J. Dwyer, Technical Director

**COPIES:** Board Members

**FROM:** L. Zull, B. Heshmatpour, and H. Massie

**SUBJECT:** Maintenance Program at High-Level Waste Tank Farms,  
Savannah River Site

This report documents issues related to the maintenance program at the high-level waste (HLW) Tank Farms at the Savannah River Site (SRS). These issues were identified during a review conducted by L. Zull, B. Heshmatpour, and H. Massie of the staff of the Defense Nuclear Facilities Safety Board (Board), together with Site Representative M. Sautman. The review was conducted December 2–4, 2008.

**Maintenance Program.** The requirements for a maintenance program at Department of Energy (DOE) facilities are described in DOE Order 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*. The Order contains both contractor and DOE requirements to implement a maintenance management program at each defense nuclear facility. The Order requires that each DOE contractor develop a Maintenance Implementation Plan (MIP) that satisfies specific requirements set forth in the Order. DOE also issued a *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1* (DOE Guide 433.1-1), describing a maintenance management program that would be acceptable to DOE for meeting the requirements of DOE Order 433.1.

The Board's staff performed an in-depth review of both the maintenance program and selected vital safety system components of the HLW Tank Farms. Under the maintenance program, the staff reviewed the maintenance organization, training and qualification, work control for maintenance activities, procurement of parts and materials, maintenance procedures, and DOE and contractor oversight of the maintenance program. The Board's staff then reviewed maintenance performed on a variety of safety-class and safety-significant equipment. This review included specific maintenance performed on isolation and control valves in the waste transfer system, ventilation purge fans within the ventilation system for Type III and IIIA tanks, and safety-related components of evaporator systems. The staff reviewed several occurrence report trends regarding failures of the Tank 12 purge fan. The staff found that Washington Savannah River Company (WSRC) managers had adequately trended these failures and developed corrective actions to address them.

Overall, the Board's staff found that the safety-class and safety-significant systems and equipment in the HLW Tank Farms are being adequately maintained to ensure they can perform their intended safety functions. The staff did identify issues related to DOE and contractor oversight of the maintenance program and some weaknesses in the maintenance instructions and procedures, as described below.

**DOE Oversight of the Maintenance Program.** DOE Order 433.1A requires that DOE review and approve a contractor's MIP every two years. The last DOE review letter approving the Tank Farms contractor's MIP was dated February 29, 2000. DOE has not reviewed the contractor's MIP since that time.

**Contractor Oversight of the Maintenance Program.** WSRC was the site Management and Operating (M&O) contractor from April 1989 until July 2008. WSRC developed the 1Y Manual, *Conduct of Maintenance*, and stated that this manual was its MIP. A new contractor, Savannah River Nuclear Solutions, LLC (SRNS), assumed M&O responsibility for SRS infrastructure services (including maintenance) in August 2008. SRNS chose to accept the 1Y Manual in its entirety, and is currently using it to administer the site maintenance program. The staff understands that a review of the existing MIP, along with information in DOE Guide 433.1-1, is being performed jointly by WSRC and SRNS. Although compliance with DOE Guide 433.1-1 is not a contractual requirement, the staff believes the maintenance program would benefit by comparing the MIP with the Guide to ensure that the MIP's approach provides an equivalent or better level of performance.

**Maintenance Procedures and Work Instructions.** At SRS, maintenance procedures are used on a routine, periodic basis. A maintenance procedure provides standard step-by-step instructions for installation, repair, service, or testing of a specific system or component. For non-routine repairs, site personnel prepare one-time work packages. A typical work package contains several documents, including maintenance work instructions, one or more work order summaries, standard maintenance procedures, drawings and reference manuals, safe work permits, and other required documents. Maintenance work instructions are tailored for well-defined work on a specific system or component, and include detailed information on radiological control, quality assurance, and industrial hygiene. Because maintenance work instructions lacked uniformity of style and content, the contractor implemented a computer-based program to standardize them. All new maintenance work instructions are developed using this template, and the contractor is in the process of upgrading legacy instructions.

The staff reviewed several maintenance procedures and work packages and made the following observations:

- One Immediate Procedure Change (IPC) to a procedure stated that it incorporated two earlier IPCs; however, the description did not list the earlier changes, nor were those earlier IPC forms attached to the procedure. As a result, it was impossible to determine the nature of the changes, which sometimes modified independent verification steps or Quality Assurance Witness Points. The situation was especially confusing because some steps had been modified more than once.

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- The site-wide 2S Manual, *Conduct of Operations*, states that a procedure should be revised when permanent IPCs have been active for 6 months. WSRC personnel stated that there are approximately 1800 procedures within the Tank Farms that contain IPCs, and of those, 19 procedures contained IPCs that had been active for longer than 6 months. The Board's staff expressed concern regarding the delay in revising these procedures.
- Some procedure steps lacked specific information needed to perform the activity. For example, one procedure (*Pre-Installation Jumper Checklist*, HLWM 15234, Rev. 0), asks the worker to check the welds to determine whether they are visually acceptable, but does not provide criteria for an acceptable weld. The same procedure asks the worker to set the valve actuation to the "Close" mode, but adds "(unless otherwise noted per design)." Thus the worker must rely on information not given in the procedure. The same procedure provides four different torque requirements for four different types of seal gaskets. The maintenance worker must select the proper torque. However, the procedure instructions do not specify what type of gasket is used for the particular maintenance work being performed or valve being repaired.