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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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December 13, 2004

Mr. Paul M. Golan
Acting Assistant Secretary for
Environmental Management
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0113

Dear Mr. Golan:

The Defense Nuclear Facilities Safety Board (Board) has been reviewing the performance of activity-level work planning and work control at defense nuclear sites for several years. The Savannah River Site (SRS) has traditionally implemented an Integrated Safety Management System at the activity-level that has resulted in an adequate work planning and work control system. However, recent changes in the hazard analysis process, as well as the increased risk associated with deactivation and decommissioning efforts, have resulted in a number of notable occurrences in which workers received unplanned exposures or contamination was released. Corrective action is necessary to preclude further degradations in performance.

The Board notes that the site-wide work planning and control program and its directives are being modified and improved as the deactivation and decommissioning processes mature. During a recent visit to SRS, however, the Board's staff observed that sets of controls are often developed to work scopes covering several weeks or months of work. As a result, the identification and analysis of specific or unique hazards associated with the actual daily or weekly work and the requisite development of appropriate controls may be inadequate. The use of standard and broad scope type work packages are generally employed in an attempt to increase productivity. However, experience has shown that this practice can lead to safety problems, as was the case last year with the glovebox fire at the Rocky Flats Environmental Technology Site. More frequent identification of specific emerging hazards is particularly important in evolving activities such as deactivation and decommissioning. This concern is heightened for the more complex deactivation and decommissioning activities that will be carried out at SRS in the future.

Subsequent to the staff's visit, the Department of Energy's Savannah River Operations Office issued a letter to Westinghouse Savannah River Company (WSRC) identifying the problem with WSRC's process for conducting hazard identification. Furthermore, during the

Board's visit to SRS on November 17, 2004, the site discussed specific actions being taken to address these concerns. To assist you in making improvements to the work planning process, a report documenting the results of the staff's review at SRS is enclosed for your information and use.

Sincerely,

John T. Conway
Chairman

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

Enclosure

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Issue Report

November 2, 2004

MEMORANDUM FOR: J. K. Fortenberry, Technical Director

COPIES: Board Members

FROM: D. Burnfield

SUBJECT: Activity-Level Work Planning and Control of Deactivation and Decommissioning Work at the Savannah River Site

This report documents a programmatic review of work planning and control for deactivation and decommissioning (D&D) activities at the Savannah River Site (SRS). This review was conducted by members of the staff of the Defense Nuclear Facilities Safety Board (Board) D. Burnfield, D. Owen, and J. Contardi, assisted by outside expert D. Volgenau. The focus of the review was on how the Integrated Safety Management (ISM) process is used to identify and implement appropriate controls to protect workers from activity-level hazards. The review concentrated on D&D work activities at F-Area Complex. To demonstrate the methods used for activity-level work planning, site personnel chose the 247-F facility, a large facility with many hazards, both chemical and radiological (e.g., gloveboxes, process piping).

Background. SRS is in the early stages of a new and difficult long-term D&D activity. The current contract covers fiscal years (FY) 2003 to 2006, but site D&D is expected to continue for many years beyond the current contract. In October 2003, the site contractor, Westinghouse Savannah River Company (WSRC) integrated another contractor, CH2 Savannah River Company (CH2SRC), into the site D&D effort and reorganized the effort under a single manager. CH2SRC brought in a group of 15 managers from the Rocky Flats Environmental Technology Site who also had commercial D&D work experience.

The D&D work at SRS is planned and performed essentially within the site's existing ISM System. Because of the unique challenges and requirements of D&D work, WSRC had developed a specific program and associated directives for planning and accomplishing such activities. Through a formal process, the 247-F facility had been isolated electrically and mechanically from external sources of energy, and temporary services (e.g., lighting, portable air conditioning, fire alarms) had been installed in the facility to facilitate work.

The D&D work planning and control program and associated site directives are being modified and improved as the processes mature. Although there are provisions for the use of subcontractors in the site D&D contract, a decision was made in January 2004, for various reasons, to commence converting all D&D work to in-house (WSRC) assets. This conversion had nearly been completed at the time of the staff's review, though it was expected to take until the end of FY 2006 to finish redirecting all subcontractor work out of the D&D arena.

Observations. To safely accomplish the large amount of unique D&D work expected in the near term, SRS must improve its work planning and control processes to account for the difficulty and uniqueness of D&D work. The following observations, organized according to the five core functions of ISM, support this conclusion.

Define the Scope of Work—At the time of the staff's review, D&D work was clearly defined, prioritized, organized, and planned only at the top level. A site D&D work control procedure had been issued that directed how D&D work was to be defined and planned. This procedure provided for the unique requirements of D&D work while referencing established site procedures where appropriate. D&D projects for a given facility were typically subdivided into smaller work areas called "zones." For the 247-F facility there were 100 zones, 82 of which involved a radiological or chemical hazard. Each zone was assigned to a planning team that consisted of an engineer, a planner, subject matter experts (SMEs), a first-line manager, and a team of D&D technicians. Their efforts were overseen by a D&D manager and a project manager. The top-level work to be accomplished in the overall zone was used as the main task for each zone work planning effort. Up to several unique subordinate tasks were included for any given zone.

As a first step in the work planning process, an engineer typically completed a characterization of the zone's environment—including identifying potential hazards—in which the main and subordinate work tasks were to be conducted. Using this information and other data (e.g., from extensive team walkdowns, radiological surveys, and discussions with the engineer and SMEs), a planner then executed an automated hazard analysis (AHA) and constructed a draft work package for review by the balance of the work planning team.

The result of this process was a large work package for all of the work to be accomplished during the next 3–4 months in that zone. Typically, the package contained the engineer's characterization report, two AHAs (one for the main task and another for the subordinate tasks), top-level work instructions, two standing radiological work permits (RWP) (one for low-risk work and another for higher-risk work), and various other attachments. The package was then approved by the project manager, the D&D manager, and the first-line manager before it was issued.

Although the work planning process included many sound practices, the resulting work package did not define and plan the work that was actually to be done on a daily or weekly basis. Decisions on what specific work to perform daily or weekly were to be made by the first-line manager, who was responsible for identifying and using those portions of the work package pertinent to the work to be conducted. No systematic tools were provided to the first-line manager for accomplishing this task. The result has been variability in the quality of the work performed and in the ability to control the work to maximize the safety of the workforce.

Analyze the Hazards—The AHA process is used to assist in identifying hazards and appropriate controls for planned work. This process replaced a manual system in October 2003. As noted above, the work planner used the AHA tool to identify the hazards (and the resulting

controls) for the main and subordinate tasks in the work package. The result was then discussed, along with the draft work package, during a work team AHA meeting. This meeting resulted in a final work package. Since the work had been defined only at the top level, the specific hazards to be encountered during daily or weekly work were not identified and analyzed. The AHA tool could not readily be tailored for the identification and analysis of specific or unique hazards associated with a particular zone. Radiological hazards were not analyzed in the AHA; instead, reference was made to the RWPs contained in the work package. The RWPs were not specific to task and zone work. Some D&D managers believed that the AHA process in its present form, complicated their work planning efforts, and that the system was not responsive to the incorporation of changes designed to enhance the identification and analysis of D&D work hazards. Many of the weaknesses of the AHA process also would be a problem in work planning efforts for areas other than D&D at SRS.

Develop and Implement Controls—Although the work procedures reviewed by the staff had adequate controls for the identified hazards, the lack of an adequate process to identify and plan for the actual work being done on a daily or weekly basis, coupled with the weaknesses identified in the AHA process, made it impossible to conclude that the appropriate work controls had actually been implemented. The AHA tool simply dictated specific work controls for a potential hazard and did not foster a hazard analysis that would have resulted in implementation of the hierarchy of controls identified in Department of Energy (DOE) Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*. Further, there was no process for identifying and resolving potential conflicts between the mandated work controls.

Perform Work—Despite the above-noted weaknesses in the D&D work planning process and several D&D-related occurrences documented in recent months, it appeared that the D&D work was being accomplished with a high level of concern for worker safety. First-line managers were observed giving thorough pre-job/task briefings, with worker participation. However, it did not appear that zone work packages were always being closed out in a timely manner. Managers appeared to be experienced and responsive, and demonstrated a highly positive attitude regarding the projects in which they were engaged. Managers and members of the work planning team were noted to be in the field observing work on a frequent basis. An aggressive training program for managers and workers, designed to support safety in D&D work, was in progress and maturing; plans were being made to institutionalize recent changes to correct deficiencies.

Provide Feedback and Continuous Improvement—The site contractor had prescribed a number of processes for self-assessment and the capture of lessons learned for continuous improvement. The effectiveness and maturity of these processes varied. Lessons learned from D&D activities at other sites, as well as SRS D&D work, could be captured more effectively. An impediment to this was the apparent lack of post-job reviews and timely closeouts of work packages. Some efforts did appear to be effective. For example, (1) reviews and critiques of occurrences appeared to be thorough, with lessons learned being captured and promulgated; (2) a Behavior–based Safety System of workers observing workers during work had recently been initiated and appeared to be maturing and providing some useful feedback; (3) the presence of

managers and supervisors in the field had resulted in immediate corrective action in several cases; and (4) a proactive report on work planning issues resulting from the 2003 Rocky Flats glovebox fire had been provided to the workforce.

DOE Contractor Oversight—DOE's Savannah River Operations Office (DOE-SR) appeared to be overseeing D&D work effectively. The Closure Project Office was using project teams consisting of D&D project leads and facility representatives who were supported in a matrix manner by SMEs. The facility representatives appeared to be well qualified, while the project leads were undergoing training and qualification. Many of the individuals had significant DOE or other related experience. The project leads and facility representatives were attending daily and periodic contractor meetings, were actively providing feedback to the contractor, and were validating the contractor's corrective actions and milestone completions. The facility representatives were spending considerable time in the field observing work. DOE-SR has also conducted some annual contractor assessments. However, additional training may be necessary to ensure that DOE-SR personnel understand the fundamental aspects of a good process for activity-level work planning and control so they can establish appropriate expectations for the contractor's processes.

Conclusion. The site has a large future D&D workload, which will involve much more complex and hazardous activities. It is critical that SRS develop solid processes and procedures for this new and different type of work. These processes and procedures must reflect the differences between D&D activities and current site work and be written to alleviate the burdens currently placed on the first-line manager.