DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Washington, DC 20004-2901

March 30, 2011

The Honorable Inés R. Triay
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) has visited several Department of Energy Environmental Management sites during the last few years to review the implementation of integrated safety management at the activity level. These reviews have focused on work planning and control, and have evaluated the quality of procedures to establish adequate hazard controls by observing work in the field. In a separate set of reviews at the Hanford Tank Farms, the Board's staff focused on observing the conduct of operations in the field during a November 2010 site visit, and similar visits in 2009. The staff reports clear improvement in some areas of conduct of operations, but persistent issues in other areas. The Board has been encouraged by the substantial effort contractor senior management has and is making to improve conduct of operations at the Tank Farms, including the establishment of a conduct of operations council and the use of conduct of operations coaches. This intense focus to improve conduct of operations at the Tank Farms is an important and necessary part of preparing the Tank Farms for the far more intense operational tempo, which will be required to safely and efficiently provide feed to the Waste Treatment Plant (WTP) starting in 2016.

During the most recent visit by the Board's staff to the Tank Farms in November 2010, it was evident that corrective actions for weaknesses observed by the Board's staff and representatives of the Department of Energy's Office of River Protection in 2009 have not been fully effective. Primary issues are associated with the quality and level of detail of work instructions/technical procedures, adherence by workers to written steps, and review and control of the work by the supervisors at the worksite. As documented in the enclosed report, the Board's staff observed variations in the formality demonstrated by operators and supervisors while conducting nuclear operations. It is crucial that all nuclear workers have a clear understanding of facility-wide expectations for formality of operations. Key mechanisms for reinforcing these expectations are oversight and mentoring by the contractor's supervisors in the field and conduct of operations coaches.

The Board believes it is critical to sustain a consistent, high degree of formality while conducting nuclear operations at the Hanford Tank Farms. The Board believes that there will be continued improvements in the conduct of nuclear operations at the site as enhancements are implemented and the process matures. Given the importance of improving conduct of operations at Tank Farms to safely and efficiently deliver first feed to WTP in 2016, the Board will continue to track implementation of the program and requests an update within 180 days on progress made to continually enhance the conduct of operations.

Sincerely,

Peter S. Winokur, Ph.D.
Chairman

Enclosure

Ms. Stacy L. Charboneau
Mrs. Mari-Jo Campagnone

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Issue Report

November 29, 2010

MEMORANDUM FOR: T. J. Dwyer, Technical Director

COPIES: Board Members

FROM: T. Hunt

SUBJECT: Conduct of Operations, Hanford Tank Farms

This report documents a review of the conduct of operations at the Hanford Tank Farms by members of the staff of the Defense Nuclear Facilities Safety Board (Board). Staff member S. Lewis and outside expert D. Boyd observed work activities during the week of November 8, 2010, and staff member T. Hunt observed work during the week of November 15, 2010. The Board's site representative, R. Quirk, also participated in the review.

Background. Washington River Protection Solutions, LLC (WRPS) is the Tank Farms Operations Contractor, overseen by the Department of Energy's Office of River Protection (DOE-ORP). WRPS operates and manages the Tank Farms with three basic organizations, each chartered to perform separate missions: Base Operations is responsible for overall compliance and surveillance of the Tank Farms and miscellaneous ancillary facilities, including the 222-S Laboratory; Projects is responsible for design, scheduling, execution, and turnover of Tank Farm projects; and Retrieval Operations is responsible for design, scheduling, and execution of waste transfers from single-shell tanks into safer double-shell tanks.

Observations and Comments. Since late 2009, the Board's staff has performed three reviews at the Tank Farms during which deficiencies in conduct of operations were evident.

- Activity-level work planning review in November 2009 (observations documented in March 12, 2010, letter and report; DOE response with corrective action plan received on June 25, 2010)

- Conduct of operations review in December 2009 (some observations documented in March 12, 2010, letter and report; others shared with site during review and closeout teleconference)

- Conduct of operations review in November 2010 (observations documented in this report)

Several of the deficiencies observed are of a recurring nature. The primary deficiencies relate to the quality and use of work instructions/technical procedures used for operations, maintenance, and construction activities. The quality and implementability of work documents, adherence by workers to written steps, and review and control of work by Field Work Supervisors (FWS) all exhibited weaknesses during the staff's review. It is essential that the Tank Farms Operations Contractor institutionalize formal conduct of operations and a strong safety culture, especially before high-hazard operations begin at the Waste Treatment and Immobilization Plant later in this decade.

Following are details of specific areas in which improvements could be made to increase the formality and rigor with which operations are conducted at the Tank Farms.

Work Instructions/Technical Procedures—WRPS continues to struggle with improving the quality of its work instructions and technical procedures (generically, work documents), especially regarding the implementability. The staff found that some of the construction and maintenance work instructions are written in a way that makes them difficult for the workers in the field to interpret and execute in a step-by-step manner. This lack of specificity and clarity decreases the usefulness of the work instructions, particularly for less experienced operators. During its most recent review, the Board's staff observed weaknesses similar to those noted during its conduct of operations and work planning reviews in 2009.

Examples of instances in which work instructions failed to meet the standards or best practices for work document content and format and thus placed an additional burden on the workers include: action steps inappropriately designated in precaution and prerequisite sections; misplaced notes, warnings and cautions; inadequate level of detail; typographical errors; and illogical action step sequencing. The Board's staff provided numerous comments related to deficiencies in the work instructions to WRPS management subsequent to its most recent review.

Control of Work by the FWS—The FWS (or designee) is not consistently communicating or reinforcing expectations for formal conduct of operations at the worksite—especially with respect to work document adherence—creating variations in the formality with which work is performed. Observing the role of the FWS during work document activities involving construction and maintenance, the staff noted that the FWS has numerous responsibilities at the worksite and is not always intimately involved in managing and directing work. The staff witnessed instances in which workers performed steps out of order while the FWS was not closely observing and controlling the work. The staff noted that utilization of a method of tracking progress in a work document to reduce the likelihood of duplicating or omitting action steps by the FWS (e.g., place keeping) is not a widely implemented practice, and this may contribute to workers performing steps out of order or to the FWS not being fully aware of which step in a work document is being executed.

Pre-job Briefings—The Board's staff observed seven pre-job briefings. Three were deficient in some respects. Among the deficiencies noted: workers left a briefing for extended periods of time; an FWS did not request or ensure that all attendees sign the attendance roster; an FWS did not use a checklist, and thus failed to cover some of the required items; a briefing did

not address some sections of the work instruction; and a briefing was conducted without all key people in attendance. The staff noted similar deficiencies related to pre-job briefings during its 2009 conduct of operations review at the Tank Farms and communicated them to cognizant site personnel.

The WRPS Conduct of Operations Council (Con Ops Council) recently suggested enhancements that could be made to the pre-job procedure (TFC-OPS-MAINT-C-02, *Pre-job Briefings and Post-job Reviews*) and checklist. Although the current procedure and checklist are adequate, this continuous improvement effort should enhance the quality and usefulness of the pre-job briefings.

Conduct of Operations Coaches—Four full-time WRPS conduct of operations coaches have been hired since April 2010. The present number of coaches is a significant upgrade in terms of dedicated resources since 2009 when only one coach was assigned. Although the staff did not observe these individuals while they were coaching, the staff met with all of the coaches and found them to be well qualified and motivated to perform their duties.

A noted deficiency is that WRPS's conduct of operations documentation does not define the coaches' roles and responsibilities and chain of command (the staff also noted this weakness during its review in 2009 and communicated it to site personnel). A discussion with one of the conduct of operations coaches indicated that there are plans to incorporate the roles and responsibilities of the coaches into an operating plan or standard. This formalization should increase the coaches' effectiveness and give them added credibility and visibility within the organization.

WRPS also contracted for the services of four temporary conduct of operations coaches to support the permanent coaches while they familiarized themselves with their new responsibilities. The WRPS president brought in these four highly-qualified individuals for a 2-month assignment that ended in mid-November. All had extensive experience in operations at Hanford and/or other DOE sites, as well as a Navy background. The Board's staff met with them during their final days at the site, and they shared their principal observations and concerns. Many were similar to the staff's observations: work packages are not well engineered and do not contain adequate detail; place keeping is underutilized; expectations are not clearly communicated during pre-job briefs; and FWSs are overloaded and may be juggling several jobs, leaving workers to perform some operations without sufficient supervision and direction.

WRPS managers stated that they had been apprised of the concerns expressed by the temporary conduct of operations coaches. Assuming concurrence by cognizant DOE personnel, the above issues need to be captured in the WRPS Problem Evaluation Request (PER) system or otherwise tracked to resolution and closure.

Con Ops Council—The Board's staff reviewed the charter of the Con Ops Council and recent meeting minutes and noted the sparse number of bargaining unit members on the council and the poor turnout at the meetings. According to the charter, the council comprises about two dozen voting members from the various Tank Farms organizations. Included in this membership

are only three bargaining unit employees and a bargaining unit safety representative. According to the corrective action plan provided to the Board by DOE on June 25, 2010, an effort was made by WRPS management to attract wider bargaining unit participation on the council. This initiative apparently failed. The staff believes the small number of bargaining unit members reduces the council's effectiveness in motivating workers to identify conduct of operations deficiencies and recommend improvements, and increases the difficulty of obtaining worker buy-in for conduct of operations enhancements proposed and initiated by the council.

Minutes of the October 25, 2010, meeting showed that only 9 of 24 members on the roster, and none of the 3 bargaining unit members, attended. Presently, the only bargaining unit members on the council are nuclear chemical operators, but the council chair plans to broaden the representation to include maintenance and other personnel. The chair expressed plans to reschedule the meetings so they do not conflict with the lunch breaks of bargaining unit employees, to scrub the roster to ensure that only the necessary individuals are listed, and to communicate that key employees who have not been attending meetings regularly need to make them a higher priority.

The staff made a similar observation during its conduct of operations review in 2009 and shared it with DOE and contractor management. Attendance was relatively low then, and only three of the members were from the bargaining unit. Other affected crafts, as well as industrial hygiene and work planners, were not represented.

Housekeeping—The staff walked down the SY and C Farms and identified numerous housekeeping and posting deficiencies. Many items no longer in use were scattered around, some in areas that are regularly traversed. These tripping and fire hazards included equipment, trash, and construction debris (lead wool blankets, pallets, plastic piping, cardboard, plastic sheeting, etc.). Construction postings, barrier ropes, and identification signs were lying on the ground.

A Tank Farm procedure addresses waste management and housekeeping. It states that personnel performing work activities are expected to maintain work areas in a neat and orderly condition and restore them to prework conditions upon completion or suspension of the activities. Workers are not fully meeting this expectation.

In response to the Board's letter of March 12, 2010, WRPS committed to "improve the physical condition and housekeeping" in the Tank Farms areas. Although WRPS made progress in fiscal year 2010 removing reusable contaminated equipment from the Tank Farms, and 120 PERs related to housekeeping were closed, WRPS remains challenged to address existing housekeeping issues while managing newly generated debris/waste.

Maintenance and Inspection—A precaution in certain work instructions requires that all vehicles within the Tank Farm boundary be authorized for access and have a current ignition source control sticker. During operations at C Farm, the Board's staff noticed that a vehicle within the farm boundary did not have the appropriate sticker affixed in a visible location. WRPS personnel reviewed maintenance records but found no evidence that the subject vehicle

had ever been inspected or issued a sticker. Records indicated that only about 25 Tank Farm vehicles have been entered in the maintenance database, yet many more vehicles likely access the farms. The staff believes the process for ensuring and documenting authorization of vehicle access and application of ignition source control stickers is weak. WRPS personnel informed the staff that they are reviewing the current process and plan to perform an extent-of-condition review.

Radiological Controls—The process to ensure that new revisions of the radiological work permit (RWP) are printed out and entered into the notebook for use is ill-defined and needs to be more formal. For example, during a pre-job brief, a health physics technician reviewed the RWP and pointed out that a revision had been made the night before. After the briefing, personnel scheduled to enter the Tank Farm went to the Access Control Entry System (ACES) station to read the RWP located in a notebook and then signed a roster sheet to signify that they had read and understood the RWP. When a DOE-ORP facility representative read the RWP, he noticed that the correct revision was not in the notebook. Approximately a dozen personnel before him had signed without noticing the incorrect revision.

In a similar instance the following week, a DOE-ORP facility representative found an RWP in a different notebook to be out of date by almost a week. The revision of the RWP in the notebook did not match the revision called up on the computer at the ACES station. Numerous personnel had signed in under the incorrect revision of the RWP.

Shift Turnover—The Board's staff observed turnover of shift responsibility at Base Operations and reviewed the associated documentation. The staff identified an opportunity for improving the documentation and the turnover process. During turnover at the end of the day shift, the staff noticed that the turnover sheet containing important topics to cover during the turnover of shift responsibility was not used. Complete and consistent coverage of important topics would be facilitated by use of such the turnover sheet.