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**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901



February 25 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) reviewed activity-level work planning and control processes and their implementation by Washington Closure Hanford, LLC during September 28–30, 2010. The staff found that WCH has made improvements in work planning and control processes since the Board issued a letter on this subject to the Department of Energy's (DOE) Office of Environmental Management (EM) on October 30, 2008. In the enclosed report, the staff provides observations from its review and identifies additional process enhancements necessary to improve the implementation of Integrated Safety Management in the activity-level work planning and control processes, including the need to strengthen feedback and improvement and training.

The Board continues to emphasize that all defense nuclear facilities would benefit greatly if DOE were to issue formal work planning and control guidance in the DOE directives system. Absent this formal direction, oversight and execution of work planning and control across the complex is suffering. The Board acknowledges the recently approved *Work Planning and Control Improvement, Initial Project Plan*. This collaborative effort by EM, DOE's Office of Health, Safety and Security, the National Nuclear Security Administration, and the Energy Facilities Contractors Group is a much needed move towards improving activity-level work planning and control throughout the complex.

The Board is encouraged by the recent URS Corporation initiative to develop a corporate standard for activity-level work planning and control. This corporate effort to improve work planning at DOE sites operated by URS is noteworthy.

Sincerely,

Peter Winokur, Ph.D.
Chairman

Enclosure

c: Mr. Glenn S. Podonsky
Mr. Matthew S. McCormick
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: R. Verhaagen

SUBJECT: Activity-Level Work Planning, Washington Closure Hanford, Hanford Site

This report documents a review by the staff of the Defense Nuclear Facilities Safety Board (Board) of the activity-level work planning and control activities at the River Corridor Closure (RCC) Project at the Hanford Site. Washington Closure Hanford, LLC (WCH) manages the RCC project for the Department of Energy's (DOE) Richland Operations Office (RL). The staff reviewed WCH's implementation of Integrated Safety Management (ISM) in the planning and control of activity-level work to evaluate whether written work instructions identified appropriate hazard controls to ensure worker safety. This review was conducted during September 28–30, 2010, by staff members B. Linzau, J. MacSleyne, R. Quirk, B. Sharpless, J. Troan, and R. Verhaagen, together with outside expert D. Volgenau.

Observations. The staff last reviewed WCH's activity-level work planning and control in June 2008. The result of that review was a letter from the Board to DOE's Office of Environmental Management (EM) dated October 30, 2008, which identified focus areas intended to facilitate the implementation of ISM at the activity level. The recent staff review documented in this report revealed that WCH has made improvements in the procedures and processes used to perform work. The staff, however, did identify some weaknesses in the implementation of ISM at the activity level. For example, WCH should improve the processes used to define the scope of work and ensure more consistent application of the approved hazard analysis process. Moreover, some of the weaknesses identified in the June 2008 review still exist, including a lack of integration of hazards and their controls into work instructions and the need for improved training and training tools for work planners and supervisors.

The following sections of this report summarize the staff's findings and detail opportunities for improvement in work planning and control as measured against the core functions of ISM. Of particular concern, the discussion includes multiple examples illustrating where training falls short of its intended function.

Define the Scope of Work. With the exception of planned maintenance and technical procedures, WCH uses an Integrated Work Control Program (IWCP) for planning work. The IWCP defines three different methods for planning and conducting work including routine work,

craft work, and Type 1 work. The IWCP defines routine work as work that relies on the skill of the assigned craft and on general overarching health and safety documents to cover associated hazards. Accordingly, a job hazard analysis is not performed. The responsible manager authorizes routine work on a case-by-case basis. The governing directive for WCH's IWCP provides examples of what can be accomplished as routine work, but does not clearly limit the scope of work that can be performed as routine. The decision regarding what work can be planned and accomplished as routine is ultimately left to the responsible manager. Training for responsible managers does not elaborate on this topic beyond the limited discussion provided in the IWCP.

Craft work is defined as routine work that requires a job hazard analysis (JHA) because of the hazards present in the workplace. The JHA process cannot be used to evaluate task-specific hazards in a craft work package because there are no task instructions. One craft work package the staff reviewed allowed performance of a variety of mechanical maintenance items in a number of different buildings but had only a generic JHA. For example, chemical controls included "complete PPE [personal protective equipment] checklist." For hazardous energy sources, the control specified "LO/TO [lock out/tag out] required when there is potential release of hazardous energy." When hazards such as these exist, it is more appropriate to conduct a specific task-oriented hazard analysis that explicitly identifies the hazards and the necessary controls.

Type 1 work packages are used when the work is of such a nature that detailed work instructions are required and work must be performed in a specified sequence. This work type employs the highest level of planning.

Identify Hazards and Implement Controls. WCH uses a JHA for analyzing hazards and identifying controls for activity-level work controlled by craft and Type 1 work. The JHA process is used in the IWCP as well as for planned maintenance and technical procedures. The process incorporates many good practices for hazards analysis, including a team approach, required walkdowns, an evaluation of both workplace hazards and task-specific hazards, and a "what if" process. The staff believes this JHA process has the potential to be successful, but notes that WCH currently applies it inconsistently and in some cases inappropriately as identified below. Additionally, a strengthened training program for work planners, subject matter experts, and responsible managers could help improve the implementation of this process.

The staff observed a work planning team conducting a JHA. The team did a thorough job of hazards analysis, but the staff believes more formality in the documentation of discussions during the JHA would be beneficial. The primary weakness of the current process is that the resulting JHA remains fairly general and does not necessarily capture the more detailed discussions among the JHA participants.

JHAs the staff reviewed did not always discuss task-specific hazards expected during the work being performed. This was a direct result of not always examining hazards at the appropriate task level. The "what if" scenarios reviewed by the staff were limited in scope, making it appear that they were being used perfunctorily to fulfill a requirement instead of serving as a useful tool. JHAs often reference other documents, such as general radiological work permits (RWPs) for radiological controls instead of incorporating the specific controls into

the appropriate task instructions. This failure to integrate hazard controls into work instructions is contrary to work planning and control guidance issued by EM; was identified as a weakness in the report resulting from the staff's June 2008 review; and has been documented by WCH as a lesson learned following work that caused airborne radioactivity levels to exceed RWP limits.

For waste being delivered to the Environmental Restoration Disposal Facility, WCH uses Waste Shipping and Receiving Plans (WSRPs) to identify chemical, radiological, and other hazards, as well as to specify controls for these hazards. The JHA references the WSRP, and the controls are not specified in work instructions. Thus, the WSRP is used as a hazard analysis tool and provides supplemental work instructions, but is not approved in the contractor's ISM system description as a mechanism for these activities. There were at least three instances during the past year when lessons learned resulted from the failure of the WSRP process to adequately analyze and control chemicals. Despite these lessons learned, WCH had not identified the WSRP as a hazard control weakness. The staff believes this is a result of a feedback and improvement process that does not identify root causes, but rather fixes the immediate problem.

JHAs for Type 1 work packages require that a walkdown be performed unless hazards preclude entry by the planning team, or a walkdown is not feasible. In the latter cases, the responsible manager must sign to approve the use of a tabletop discussion and document the reason on the JHA. If a portion of the work area is not accessible during the JHA walkdown and the walkdown requirement has not been waived, a hold point must be placed in the work package. Once the area becomes accessible, an additional analysis is required to confirm that hazard controls are adequate before work can continue. This is an improvement over what the staff observed in its previous review, when tabletops were the norm rather than the exception. However, in one instance during the September 2010 review, the staff identified a Type 1 work package JHA that was performed as a tabletop, but the responsible manager had not waived the walkdown, and no hold point was in the procedure to ensure that hazard controls were adequate when access was restored.

Perform Work Within Controls. The staff observed multiple pre-job briefs that were both thorough and interactive, reflecting the good safety culture and management involvement observed during the staff's June 2008 review. The staff attempted to observe field remediation operations and waste operations, but standoff distances precluded meaningful observations. The staff was unable to observe work in the 300 area because work was not performed as scheduled. Therefore, it was difficult to assess how well work was being performed within controls.

During the week of this review, personnel used the wrong work package to drill holes in the Building 309 stack for explosive placement in preparation for the Building's demolition. The package used was a craft work package developed in preparation for the demolition of Buildings 337 and 337B. The scope of this craft work package included drilling holes in various columns and walls in Buildings 337 and 337B. The Type 1 work package that should have been used encompassed performing structural weakening of the Building 309 stack and Buildings 337 and 337B, which included drilling holes in the Building 309 stack. The staff believes that the broad scope of work locations allowed by these two work packages, the similarities in the work they controlled, and the lack of a clear distinction between the boundaries of the two were likely contributors to this event. Additionally, the work had been authorized verbally and not formally documented on the Plan of the Day as required.

Feedback and Improvement. WCH uses project coordinators as the focal point for its lessons learned programs. A WCH lessons learned coordinator provides training for project coordinators, who in turn disseminate lessons learned to assigned managers, supervisors, and workers. The project coordinators share lessons learned across projects. As mentioned previously, WCH could improve the lessons learned program if it performed a more thorough analysis of the underlying causes of the events instead of merely fixing the immediate problem. WCH has an issue identification program that allows workers to offer suggestions, ask questions, and contribute lessons learned regarding work packages and/or practices. This appears to be an effective means of collecting worker suggestions for improvement and for sharing lessons learned.

Following the conduct of this review, the staff was invited to participate in an effort by URS Corporation, an owner of WCH, to develop a corporate standard for activity-level work planning and control. The staff feels that this effort will enhance the work planning efforts at DOE sites operated by URS.

Of note, at the time of this review, neither the contractor nor RL had used the work planning and control guidance issued by EM on April 7, 2010, to improve WCH's work control processes.

Training. The staff identified many opportunities to improve the training and qualifications of those responsible for the planning and control of activity-level work. For instance:

- IWCP directives assign responsible managers significant responsibilities for work planning, work authorization, and the oversight of work being conducted. However, no formal qualification program exists for these responsible managers. The same is true for subcontractor responsible managers as well.
- Managers and supervisors have significant responsibilities related to work planning during the development and implementation of technical procedures, yet these individuals are not required to receive training in the IWCP processes. There is no position description or evidence of formal training for the author/originator of technical procedures.
- The formal training and qualification program for work control planners does not require training as a JHA facilitator, which is included in their position requirements. Further, training in the IWCP processes consists of a general overview provided during a 2-hour classroom session. This training does not include activities associated with preparation of technical procedures and preventive maintenance work packages.
- Work packages do not clearly identify the special training or unique qualification requirements that a specific activity may require. As a result, the field work supervisors are responsible for determining on their own if the work package requires workers to have any training beyond their normal qualifications/certifications.

Richland Operations Office. Discussions with RL personnel revealed that they have identified many of the deficiencies observed by the staff. The staff believes that RL's oversight and its ability to assist WCH in correcting these deficiencies would benefit from DOE's issuance of a technical standard for work planning and control within the directives system and a guide supporting DOE Order 226.1A, *Implementation of Department of Energy Oversight Policy*. RL personnel are participating in the execution of the Energy Facilities Contractors Group's Work Planning and Control Project Improvement Plan. This should help RL in this critical area.

Conclusion. WCH has improved work planning and control processes since the staff's last work planning review. Areas for improvement remain, including some which were identified in the staff's previous review. Invoking numerous permits in the JHA does not adequately integrate hazard controls into work instructions. The situation is particularly problematic when the permit is not an approved implementing mechanism in the contractor's ISM system. Defining more clearly the scope of work that is allowed to be performed as routine, along with training for responsible managers on the subject, would be beneficial. Training for those involved in planning work, particularly in the area of hazards analysis, requires more detail. The staff believes contractors need to develop formal qualification and training programs for those with significant work planning responsibilities. Finally, a DOE-approved standard for conducting work planning and control would help the sites and site offices better incorporate ISM into activity-level work planning.