DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Washington, DC 20004-2901

March 28, 2011

The Honorable Thomas P. D'Agostino
Administrator
National Nuclear Security Administration
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0701

Dear Mr. D'Agostino:

The staff of the Defense Nuclear Facilities Safety Board (Board) reviewed activity-level work planning and control processes and their implementation by National Security Technologies, LLC (NSTec) at the Nevada National Security Site (NNSS) during November 15–19, 2010. The staff identified weaknesses in processes and procedures for work planning and control that result in poor integration of the core functions of Integrated Safety Management into activity-level work. Specifically:

- Activity-level work planning processes and procedures used by NSTec fail to provide adequate guidance for the performance of hazard identification and analysis. As a result, some plausible activity-level hazards are overlooked, and work procedures omit applicable hazard controls.

- The scope and applicability of some work procedures are too broad and general. As a result, workers and supervisors must identify specific work steps and hazard controls in the field to complete their work safely and effectively.

- Lessons learned from activity-level work processes are not effectively captured and fed back into the work planning process. Metrics to improve work planning processes are not effectively employed by either the Nevada Site Office or NSTec.

- Plans of the Week, Plans of the Day, and Real Estate Operating Permits do not ensure facility managers are fully aware of the specific work activities being performed within their facilities, which reduces their ability to properly manage their work.

The Board continues to emphasize that all defense nuclear facilities would benefit greatly if the Department of Energy (DOE) were to issue formal work planning and control guidance in its directives system. Absent this formal guidance, oversight and execution of work planning and control across the complex are suffering. The Board acknowledges the recently approved

Work Planning and Control Improvement, Initial Project Plan. This collaborative effort of the National Nuclear Security Administration (NNSA), DOE's Office of Environmental Management (EM), and Office of Health, Safety and Security, and the Energy Facilities Contractors Group effort could lead to improvements in activity-level work planning and control throughout the complex. The Board believes this project plan could be a good vehicle for the development of the technical standard for work planning and control discussed in numerous Board letters to NNSA and EM on the subject.

Based on the above observations and pursuant to 42 U.S.C. § 2286b(d), the Board requests a report within 90 days of receipt of this letter outlining actions taken or planned by the Nevada Site Office and NSTec to address the weaknesses in work planning and control detailed in the enclosed report.

Sincerely,

Peter Winokur, Ph.D.
Chairman

Enclosure

c: The Honorable Inés R. Triay
Mr. Glenn S. Podonsky
Mr. Stephen A. Mellington
Mrs. Mari-Jo Campagnone

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Issue Report

February 7, 2011

MEMORANDUM FOR: T. J. Dwyer, Technical Director

COPIES: Board Members

FROM: R. Verhaagen

SUBJECT: Activity-Level Work Planning, Nevada National Security Site

This report documents a review by the staff of the Defense Nuclear Facilities Safety Board (Board) of activity-level work planning and control at the Nevada National Security Site (NNSS). NNSS is managed and operated for the National Nuclear Security Administration and the Department of Energy's (DOE) Nevada Site Office (NSO) under contract to National Security Technologies, LLC (NSTec). The purpose of the staff's review was to assess the implementation of Integrated Safety Management (ISM) in the activity-level work planning and control processes used by NSTec to ensure the protection of workers. This review was conducted during November 15–19, 2010, by staff members J. Deplitch, M. Horr, J. Pasko, and R. Verhaagen, together with outside expert D. Volgenau.

Observations. The Board's staff identified weaknesses in the processes and procedures used by NSTec to plan and control activity-level work that contribute to poor integration of ISM at the activity level. In particular, instructions for planning work are incomplete and fail to provide work planners with adequate direction for implementing the core functions of ISM in the work planning process. The staff's review identified many instances of weakness in defining the scope of work and performing hazard analyses. The result is work instructions that must be modified in the field, fail to identify plausible hazards, and contain incomplete controls to ensure worker safety. Additionally, NSTec uses multiple forms to aid in the work planning process. The staff identified numerous cases in which these forms were not being used as specified and/or were filled out improperly. These deficiencies may indicate that the defined processes are too complicated or attract insufficient management attention. The following sections summarize the staff's findings and detail weaknesses in work planning and control as measured against the core functions of ISM.

Define the Scope of Work. The staff identified many cases in which work packages did not adequately bound the scope of work or appropriately identify the task-level instructions required to complete the work. In instances observed by the staff, the scope and applicability of work instructions was so broad that workers and supervisors were making decisions on appropriate hazard controls and acceptance criteria in the field. More appropriately, the specific

hazards and their controls should have been identified, analyzed, and documented in work instructions prior to commencing work; criteria for inspections could have been more clearly articulated in work packages. For example:

- A facility work package required the cleaning and replacement of air filters used in an application important to personnel safety and security "as necessary." It did not specify cleanliness or replacement criteria or identify the replacement filters.

- A quarterly preventive maintenance work package for special doors in a facility required an inspection of doors and frames for missing and/or deteriorating paint. However, the work package did not include criteria for what constitutes an unsatisfactory condition, instructions for documenting these results, or required reporting action. The Board's staff noted several doors and frames with extensive chipped paint indicating the current procedure is not being effectively employed.

- The work package for special doors required a lockout/tagout. The work package for special doors was applicable to several types of special doors. The job foreman indicated that no lockout/tagout was required for the specific doors being worked on, and none was executed. Apparently, this requirement did not apply to all doors.

- Workers could not complete a work package used to install grounding wires on electrical panels because the required installation holes had not been prepared in advance. This situation could have been prevented by an adequate walkdown of the jobsite during preparation of the work package.

- A work package indicated that hearing protection must be worn "when required." The briefer did not identify conditions that would require the use of hearing protection.

In most of these cases, even though the work could not be performed as written in the work package, workers did not consider stopping work so the issues could be resolved. The staff's observations suggest that NSTec relies heavily on its craftsmen to execute work packages in accordance with their skills instead of controlling their actions through procedures.

Identify Hazards and Implement Controls. Activity-level work planning directives used by NSTec fail to provide adequate direction for the performance of hazard identification and analysis. The staff noted a number of weaknesses in the processes used to identify and analyze hazards. For instance, hazards are not analyzed collectively. For the work packages reviewed by the staff, work planning teams had performed administrative tabletop exercises instead of the more effective method of conducting team walkdowns. In fact, these tabletops often were not performed as a team activity; instead, individuals conducted the reviews and submitted comments electronically. By procedure, work planners identify generic hazards using an automated checklist that provides generic controls not tied or tailored to the specific steps of the work being planned. Work planner training to ensure that they can successfully lead work planning teams in identifying hazards and implementing controls at the activity level does not go

beyond what is contained in work planning directives. As a result, plausible activity-level hazards are overlooked, and work procedures omit some applicable hazard controls. For example:

- A preventive maintenance work package for a mine hoist failed to identify all pertinent hazards (e.g., injury from moving hoist components such as guide wheels while people were positioned on top of the hoist).

- One work package did not include the hazards and controls specified in the referenced Material Safety Data Sheet.

- One work package identified heat stress and fatigue as potential hazards, but did not specify controls for these hazards.

Perform Work within Controls. NSO authorizes activities at NNSS through the use of Real Estate/Operating Permits (REOPs). There are two types of REOPs: primary REOPs, used for work performed by NSTec in a given facility or geographic area; and secondary REOPs, used for work in a given facility or geographic area performed by others, including NSTec's numerous subcontractors and Lawrence Livermore and Los Alamos National Laboratories. Work is authorized and controlled through the use of these REOPs; associated work packages; and, depending on the facility, the Plan of the Week (POW) or Plan of the Day (POD). Secondary REOPs reviewed by the staff were approved for a 1-year time period and provided a general description of the work that was authorized. The staff's review of POWs and PODs revealed numerous authorized work items that were listed only by the title of the work to be performed. This method of authorizing work makes it difficult for facility managers to know precisely what work is being performed in their facility so the work can be safely deconflicted and controlled.

The staff observed pre-job briefings to identify how hazards and their controls are communicated to workers prior to the start of work. These pre-job briefings would have benefited from more interaction between the supervisor and the workers. In one case, the briefing consisted of the foreman reading the entire work package verbatim, including much material that was unrelated to the work to be performed. The workers did not participate, but merely listened. In another case, for low-complexity work, the foreman read all of the precautions and limitations in the package; much of this material did not apply to the work to be performed. Moreover, several workers arrived late to the briefing and had been assigned to a different task than the one being briefed. One worker added a work task to the package that had not been mentioned previously and for which no specific hazards and controls had been identified. The foreman did not review any of the material for the late arrivers, yet all workers were required to sign an acknowledgment sheet at the end of the briefing.

Additionally, during the performance of work under a preventive maintenance work package, barriers had been set up around the work area. Security personnel ignored the barriers, walking through them at will. When challenged by the foreman, the security personnel simply ignored him.

Feedback and Improvement. NSTec recognizes the need to improve how lessons learned from activity-level work processes are captured and fed back into the work planning process. The staff has observed this weakness at nearly all DOE defense nuclear facilities. NSTec can be expected to benefit in this area, and many others, from its participation on the combined Energy Facilities Contractor Group and DOE *Work Planning and Control Improvement, Initial Project Plan* team.

NSTec has recently attempted to improve the process by which lessons learned are communicated to workers before the start of work. Noteworthy practices include requiring that a lesson learned be part of every work package and evaluating the relevance of the lesson to the work being performed. The evaluation process is still in its initial stages; the staff observed one pre-job brief in which the lesson learned included in the work package was not germane to the work being performed.

NSTec recently assigned a process improvement engineer responsibility for randomly visiting worksites conducting maintenance where work packages incorporate quality holdpoints. This is a noteworthy practice that appears to have resolved an issue concerning the failure to observe holdpoints. This practice would be enhanced by being formally incorporated into site procedures.

Nevada Site Office. To aid in the control of activity-level work and in oversight of the many different users within its facilities, NSO has issued an order, *Activity Level Work Control.* This order is intended to establish requirements for documentation of contractor/user activity-level work and to facilitate the execution of safety coordination responsibilities by REOP holders. The staff notes that this document could be improved by being aligned with the ISM core functions.

In exercising its oversight, NSO has not identified the work planning and control weaknesses observed during the staff's review. Oversight of activity-level work normally is performed by Facility Representatives in their routine observation of contractor activities. Six of seven operational assessments conducted since April 2010 were "shadow" evaluations in which the Facility Representatives observed a review performed by NSTec, instead of conducting their own review. NSO admittedly lacks a mature system for conducting trend analysis in support of its assessment activities. However, it recently began using ePegasus software to track issues identified by NSO. Currently, insufficient data exist with which to conduct meaningful trend analysis, but NSO expects the program to mature over the next few years.

The staff believes that NSO's oversight and its ability to assist NSTec in correcting the deficiencies described in this report 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.* NSO would also benefit from participation in the execution of the previously mentioned *Work Planning and Control Improvement, Initial Project Plan.*