Office of Independent Oversight and Performance Assurance
Office of Security and Safety Performance Assurance
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Independent Oversight Security and Emergency Management Pilot Integrated Performance Tests at the

Nevada Test Site

September 21, 2004

SSA
Office of Security and Safety Performance Assurance

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SECURITY AND EMERGENCY MANAGEMENT
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Acronyms

BN	Bechtel Nevada
CAS	Central Alarm Station
CIC	Communications Information Center
DAF	Device Assembly Facility
DOE	U.S. Department of Energy
EOC	Emergency Operations Center
IC	Incident Commander
LED	Local Emergency Director
NTS	Nevada Test Site
OA	Office of Independent Oversight and Performance Assurance
TTPT	Tabletop Performance Test
WSI	Wackenhut Services, Inc.

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INTRODUCTION

The Secretary of Energy's Office of Independent Oversight and Performance Assurance (OA), within the Office of Security and Safety Performance Assurance, conducted an inspection of safeguards and security and emergency management programs at the U.S. Department of Energy's (DOE) Nevada Test Site (NTS) in July and August 2004. The inspection was performed as a joint effort by the OA Office of Safeguards and Security Evaluations and Office of Emergency Management Oversight. As one element of the overall inspection, and as part of OA's initiative to integrate security and emergency management evaluations, two combined safeguards/security and emergency management performance tests were conducted. The first test was a command post tabletop performance exercise that focused on the response of the NTS protective force and selected elements of the NTS emergency response organization to a simulated emergency event. The second test involved a force-on-force performance test that included emergency management objectives. This report discusses the observations related to the emergency management objectives for these two performance tests. The results of the review of the NTS safeguards and security and emergency management programs are discussed in a separate report.

The command post tabletop performance test (TTPT) scenario involved a simulated subcritical experiment assembly at the U1a facility that was deliberately set on fire by a disgruntled worker and that subsequently resulted in personnel injuries and a potential hazardous material release. The scenario, which was developed by facility management in conjunction with Bechtel Nevada (BN) and Wackenhut Services, Inc (WSI) Trusted Agents, was presented to the participants by several Trusted Agents to ensure scenario validity and delivery of accurate event cues. The Trusted Agents also played the roles of several functions not staffed, such as fire/rescue and security dispatchers. Primary participants in the performance test included a BN local emergency director (LED) for U1a, a Los Alamos National Laboratory test director, a WSI security incident commander (IC), and a BN fire/rescue IC. Normally available support staff and the BN duty manager were also available to assist these decision-makers.

The scenario for the force-on-force performance test involved armed adversaries whose primary objective was the theft of special nuclear material from the Device Assembly Facility (DAF). In addition to the standard protocols for planning and conducting a force-on-force exercise, BN created an exercise package that included specific objectives related to the roles of the security and fire/rescue ICs in a unified command structure and the performance of the emergency management functions that would be needed in an emergency involving personnel injuries and the potential for release of a hazardous material. The exercise package also included an event timeline and exercise cues for the primary emergency management participants, most of whom were assigned exercise controllers. Participants who were evaluated from an emergency management perspective included the DAF LED, DAF operations controller, DAF WSI security IC, BN duty manager, communications information center (CIC) operator, fire/rescue IC, WSI zone lieutenant, WSI shift captain, and central alarm station (CAS) and secondary alarm station operators.

The following sections of this report provide a discussion of the observations made during the two performance tests and OA's conclusions regarding the performance of the emergency management functions. Because the two combined security and emergency management performance tests at NTS

were conducted as part of an OA pilot program to integrate security and emergency management evaluations, the emergency management elements of the combined performance tests were not rated and findings were not assigned. However, the observations, which have been validated with key Trusted Agents and participants, provide insights into the effectiveness of such key emergency response elements as command and control, categorization and classification, notification and communications, and protective actions. In addition, evaluation of the observations and conclusions that are identified in this report may be helpful in developing root causes and corrective actions for weaknesses in the observed areas, as warranted. Additionally, opportunities for improvement have been identified for consideration by NTS line management.

SUMMARY

Most emergency response personnel demonstrated a clear understanding of their emergency management roles and responsibilities. The DAF security IC understood that during a security event, the DAF LED might need to assume unilateral emergency management decision-making. During the force-on-force exercise, the DAF LED clearly understood his responsibilities for event classification and protective action decision-making, and although not actually staged, the first responding fire/rescue IC understood the need to be available for medical response without placing fire/rescue responders in harm's way. Event classification and subsequent notification by the DAF LED was both timely and accurate, and the BN duty manager ensured that event status was communicated to other response personnel and that the necessary notification information was recorded and transmitted to the emergency operations center (EOC) watch office. Significant effort went into planning the two performance tests; the scenarios were credible and they were designed to appropriately challenge the responders. Use of the U1a sand table during the TTPT afforded the participants the opportunity to visualize the response. The force-on-force setup set the stage for starting the exercise through a realistic work package and an associated plan-of-the-day meeting.

There were several notable weaknesses in the performance of responders and test controllers. As a result of not implementing an effective, unified incident command structure during the force-on-force exercise, opportunities were lost to stage fire/rescue assets and request medical mutual aid early in the exercise. In part, this can be attributed to a telephone system malfunction that prevented the DAF LED's initial event information from being routed directly to the CIC. Furthermore, although CIC made several inquiries throughout the exercise to determine if fire/rescue support had been requested, the senior fire/rescue officer onsite did not attempt to obtain permission to stage resources when it became apparent that an effective, unified command structure had not been established. Similarly, during the U1a TTPT, the BN LED did not work within the unified incident command system to resolve conflicts between security requirements and life safety concerns to identify the appropriate protective actions for facility personnel. The BN LED for U1a also did not understand the emergency event notification requirements, and therefore, although the postulated event was appropriately classified, the required notifications were never performed. In addition, neither the LED for U1a nor the fire/rescue IC ensured that protective actions for all workers in the vicinity of the event were identified and implemented. During the force-on-force exercise, controllers did not effectively communicate the status of the exercise, which caused confusion at several venues; missed injecting two contingency messages, which limited the observable scope of the exercise; and did not require players, particularly those in venues having offsite interfaces, to precede and follow exercise messages with the phrase "this is an exercise" to ensure that players and non-players alike recognized that the communications referred to events associated with the exercise.

Overall, responders understood their emergency response roles and responsibilities, and demonstrated the ability during the two performance tests to classify events and identify the necessary protective actions at the scene. Some weaknesses in performing notifications were identified, and there were problems with

exercise control as well. The most notable weakness was that responders had difficulty in either establishing or utilizing unified incident command to effectively address the issues resulting from a security-initiated event having life safety considerations. To a large extent, these weaknesses can be attributed to the absence of practice with scenarios that integrate a complex security response with facility operations and fire/rescue personnel and assets. The performance test observations and conclusions are described in more detail in the following section.

RESULTS

On-Scene Unified Command and Control

Most members of the unified command system demonstrated a clear understanding of their roles and responsibilities. The security ICs and the LEDs at U1a and DAF recognized the security IC's lead command role for security events and understood the LED's supporting role. The security ICs clearly communicated expectations for supporting the LEDs during the command post TTPT and the force-on-force exercise. The security ICs assumed tactical control of the protective force personnel, while in their support role, the LEDs classified the event, initiated onsite and offsite notifications, and formulated protective actions. During the U1a command post TTPT, in which the LED was in close proximity to the security IC, the LED informed the security IC of respiratory protection requirements that applied to protective force personnel. During the force-on-force exercise, where the LED was physically separated from the security IC, the LED communicated frequently with facility personnel and the BN duty manager to keep them apprised of intended actions and to solicit input to ensure that all actions were completed and appropriate priorities had been established. Likewise, team members informed the LED of tasks that had been completed, such as personnel accountability.

The LED's team approach resulted in the implementation of most emergency management functions during the force-on-force exercise. However, the LED's effectiveness was substantially limited by the loss of communications between the LED and the security commander that occurred after the security commander's attentions necessarily became completely focused on the tactical response. For example, as the shelter-in-place protective actions that were identified by the LED were being implemented, doors within the facility that could have provided additional protection from intruders remained open for an extended period of time while the LED attempted to obtain permission from the security commander to close them. Additionally, although the LED is required to report facility personnel accountability to the security IC for potential impacts on the tactical response, the LED did not advise CAS of the accountability results when he was unable to communicate directly with the security IC. Instead, the LED inappropriately made public address system announcements for the security IC to contact the LED when the IC was engaged in much higher priority response actions. Of greatest significance was the impact of a telephone system malfunction that ultimately precluded establishing a unified security, facility, and fire/rescue command structure throughout the exercise. As discussed in the next section, fire/rescue assets were never dispatched to a staging area and the senior fire/rescue officer did not request permission from the LED or security headquarters to do so.

Command personnel in the U1a TTPT also had difficulty using a unified incident command system to protect facility personnel. As discussed below, although the LED attempted to issue the necessary orders to ensure the protection of essential support personnel and non-essential personnel, the LED was not effective in reconciling these requirements with the security perimeter ordered by the security IC. Consequently, no orders were made to ensure that personnel used a safe route to their assembly area; no assembly area was established for essential support personnel; and no verification was made that personnel who had been evacuated but remained within the security perimeter were assembled in areas that were safe from the hazardous material release plume.

Categorization/Classification, Communications, and Notifications

The facility LED is responsible for classifying emergency events, and both the BN duty manager and the facility LED play key roles in ensuring that onsite and offsite personnel have a clear understanding of the event progression. During the force-on-force exercise at DAF, the BN duty manager effectively executed all assigned emergency duties. He accurately transcribed the information that was reported by the LED, verified event classification and obtained weather data, and asked pertinent questions of the LED regarding event status. However, the DAF and U1a LEDs demonstrated inconsistent performance in their understanding and execution of categorization/classification, communication, and notification requirements. The DAF LED assessed the significance of the security intrusion and correctly classified the event at the Alert level within two minutes of the initial public address system notification by security personnel of events in progress. He appropriately implemented facility protective actions as his priority response and then rapidly completed his emergency action checklist so that the necessary information could be provided to the fire dispatcher in the CIC in the initial 911 emergency call. Although the LED stated that he was initiating the 911 call to the fire dispatcher after completing the checklist, his message was not transmitted to the fire dispatcher. Instead, a telephone system malfunction caused the 911 call to be routed to a protective force officer, who was located offsite at the main BN office compound and who was not participating in the exercise. Consequently, the ringdown circuit that simultaneously connects the fire dispatcher, WSI patrol headquarters, and the BN duty manager was not activated, which prevented these responders from being immediately notified of the DAF emergency. After completing other priority actions, such as determining personnel accountability, the LED provided a status report to the BN duty manager. This report provided the information necessary for the BN duty manager to promptly transmit the required offsite notifications to the EOC watch office.

In contrast, the LED at U1a did not communicate initial event status and critical decision-making to the appropriate onsite entities in a timely manner during the command post TTPT. After receiving the event conditions, the LED promptly determined the correct emergency action level and associated protective actions. Although he started to make the 911 notification and provide subsequent status updates to the BN duty manager, the LED never initiated the 911 notification or directed actuation of the U1a fire alarms because he permitted himself to be distracted by questions from other responders. Subsequently, the LED did not initiate notifications to applicable onsite organizations, such as the BN duty manager, and as a consequence, timely notification would not have been made to offsite jurisdictions. Furthermore, the BN LED did not employ any emergency action checklist that could provide a record of the event progression and critical decision-making or be used as a basis for notifying the 911 dispatcher and BN duty manager. Additionally, the BN LED incorrectly stated that he had up to one hour to make classification decisions, which might explain the delay in initiating critical notifications.

Protective Actions

The DAF and U1a LEDs quickly and accurately determined protective actions from EAL tables. But they demonstrated several weaknesses in implementing protective actions for responders at the scene and for co-located workers away from the scene. Within minutes after the security intrusion had been detected during the force-on-force exercise at DAF, the LED ordered DAF personnel to shelter in the safe havens that are specified in response procedures, and the LED initiated accountability to identify the locations of DAF workers. The emergency response staff, including the LED, operations controller, and health physics representative, were stationed in the facility administrative areas and were ultimately afforded additional protection by locking interior access doors. Although this action was appropriate from a life safety perspective, the LED was unduly conservative in implementing this action by attempting to first obtain permission from the security IC, who was unavailable due to his focus on the tactical response. After concluding that the security IC was not available, the LED ultimately ordered the staff to shelter

behind locked doors and informed CAS personnel of the location of the DAF workers. Although procedures did not clarify permissive actions that the LED might take in establishing safe havens, the security IC had provided direction to the LED during the plan-of-the-day meeting to independently execute his emergency response roles and to keep the CAS informed. The CAS would then communicate critical responses to the security IC. Furthermore, in part due to an incorrect assumption that consequence assessment personnel would be readily available in either the emergency management center or the in-town EOC, the LED did not attempt to identify the extent of consequences possible beyond the facility, even though there was a potential for a release of hazardous materials due to the actions of the adversaries and the quantity and nature of hazardous materials present in the facility.

Although the potential for injuries to facility workers and protective force personnel was high during the force-on-force exercise, the security IC did not identify, designate, and implement actions to obtain key support personnel such as fire/rescue and paramedics in accordance with his checklist, which is included with the security general orders. Similarly, even though the BN duty manager made several inquiries of the LED regarding personnel injuries, the LED did not order the CIC to place medical units on standby or to stage them in a forward area to minimize the time needed for medical response when the facility condition had been stabilized. The Mercury security shift captain, upon arriving at the south staging area previously established by a mobile security unit, noted the absence of fire and rescue response units, but he was advised by an already-deployed security officer that the activation of the fire/rescue units had been simulated, so the shift captain took no action to activate them. As a consequence of the LED's initial 911 emergency call not being routed to CIC and the subsequent absence of any actions by either the DAF LED or security command authority throughout the exercise to actively engage fire/rescue officers, the fire/rescue IC did not join the unified incident command system nor did medical units position themselves for a more timely response consistent with the security defensive perimeter. On a positive note, fire/rescue units, upon hearing radio traffic concerning the emergency, independently elevated their response posture and placed other support units, such as flight-for-life, on alert.

During the U1a TTPT, the LED correctly determined that evacuating facility personnel to approximately two miles was required in response to the postulated event. The security IC determined that the extent of the desired evacuation was inconsistent with his area of containment, and he directed the LED to establish two groups of personnel: those essential to mitigation of the event and other non-essential personnel. The security IC directed non-essential personnel to the facility entrance control point established by security personnel, but neither the security IC nor the LED determined a location of safe haven or directed essential personnel to remain in that location until needed for response activities. Furthermore, the LED did not use the U1a emergency planning hazards assessment to confirm that a safe location to which personnel could be directed existed within the security perimeter established by the security IC. Additionally, the LED did not order accountability for facility personnel until more than 30 minutes had elapsed from the beginning of the event, although the consolidated emergency management plan requires that accountability be established quickly for facility personnel. Consequently, the LED did not have the information necessary to fully brief the responding fire/rescue IC regarding personnel who might require rescue and/or medical attention.

Conduct of Exercise

The TTPT and force-on-force exercise scenarios were well designed to enable NTS to demonstrate key aspects of emergency response to a security event, and BN, facility personnel, and WSI devoted a considerable level of resources, both in terms of personnel and equipment, in planning for and conducting the performance tests. Other notable elements in conducting these tests include the U1a sand table, which models facility structures and their locations, and the exercise package generated for the DAF force-on-force exercise, which included prepared messages and references that would simulate work activities and

the associated hazards analysis. However, there were a number of weaknesses observed in conducting and controlling the performance tests. For example:

- The DAF exercise was not controlled in a manner that clearly communicated to exercise personnel when play began, when holds were lifted, or how to differentiate between actual events, such as lightning strikes, and events associated with the exercise.

- For the force-on-force exercise, some positions, such as the BN duty manager, did not have controllers, or the controllers had no means to communicate with personnel directing the exercise.

- "Exercise freeze" messages were used when administrative holds had been established, even though the rules of conduct for the force-on-force exercise required that exercise freeze messages were to be used only to stop play because of an unsafe condition.

- In some cases, controllers for the force-on-force exercise did not enforce the termination of player activities when holds had been established. Similarly, controllers did not enforce the use of "this is an exercise" message during player communications, which is particularly important at venues where exercise communications might be inadvertently received by non-participants.

- Contingency messages were developed for the force-on-force exercise but were not always used when needed. For example, the message intended to activate fire/rescue assets, if not otherwise activated by responders, was never injected into the scenario.

- Participants in the U1a command post TTPT did not typically issue clear commands to accomplish specific response actions. Instead, the controllers permitted an excessive amount of player discussion, which would be more typical of a training activity. This may have confused some participants regarding expectations for accomplishing performance test objectives, and consequently may have negatively impacted the observed response and the evaluation benefit of the test.

OPPORTUNITIES FOR IMPROVEMENT

This OA inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and evaluated by the responsible NNSA and contractor line management and prioritized and modified as appropriate, in accordance with site-specific programmatic emergency management objectives.

Bechtel Nevada, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory

- Include walkdowns of scenario venues as part of the planning process for performance tests. Specific elements to consider include:

  - Ambient noise levels that may interfere in players communicating or evaluator data collection.

  - Availability of communication systems for use by players as they communicate with other venues.

- Enhance scenario controls and player briefings to improve player responses in TTPTs and force-on-force exercises. Specific actions to consider include:

- Avoid the term “tabletop” when referring to limited scope exercises, so that the players avoid the discussion-oriented responses that they normally associate with the predominantly training nature of the site’s tabletop program.

- Clearly communicate scenario delivery breakpoints, such as initial conditions, exercise start times, safety and administrative holds and hold releases, and exercise termination times.

- Provide exercise injects by timeline to drive the flow of the scenario and player responses.

- For TTPTs, physically separate fire/rescue and security players from facility personnel at the start of the test to facilitate data collection in establishing an incident command post and deploying fire/rescue and security assets.

- Consider using a “what if” approach to identify the impact of not staffing test venues or not providing controllers in communication with the test controller organization to ensure that the exercise objectives can be attained within the desired scope of the test.

- Enhance the training provided to LEDs to improve their response to emergency events. Specific elements to consider include:

  - The availability of the emergency management center and the EOC and their associated functions during both normal operation hours and off-hours, and the process by which these response centers are activated.

  - A clear understanding of what constitutes a safe haven within a facility and how safe haven is established.

  - Succession plans in the event of losses in the command and control structure.

  - Timeliness expectations in performing categorization and classification determination and notifications

  - Use of emergency planning hazards assessments in ensuring safe assembly and staging areas.

Wackenhut Services, Inc. and Lawrence Livermore National Laboratory

- Consider developing response protocols that address the roles and responsibilities of members of the unified incident command system when the lead IC is not available. Practice using these protocols in security-based TTPTs and force-on-force exercises where the security IC’s attentions are focused on the tactical response or is otherwise unavailable to respond.

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