Independent Oversight Evaluation of the

Office of Secure Transportation Emergency Management Program

February 2004

Office of Independent Oversight and Performance Assurance

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Abbreviations Used in This Report

AOD	Aviation Operations Division
ARG	Accident Response Group
CCIC	Convoy Commander In Charge
DOE	U.S. Department of Energy
EAL	Emergency Action Level
ECP	Entry Control Point
EOC	Emergency Operations Center
EOD	Explosive Ordnance Disposal
EMB	Emergency Management Branch
EMP	Emergency Management Plan
EPIP	Emergency Plan Implementing Procedure
ERDO	Emergency Response Duty Officer
FBI	Federal Bureau of Investigation
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
JTX	Joint Testing Exercise
NARAC	National Atmospheric Release Advisory Capability
NNSA	National Nuclear Security Administration
NSO	Nevada Site Office
NTS	Nevada Test Site
OA	Office of Independent Oversight and Performance Assurance
OJT	On-the-Job Training
OST	Office of Secure Transportation
PAR	Protective Action Recommendation
RCT	Radiological Control Technician
SGT	Safeguards Transporter
SOP	Standard Operating Procedure
TECC	Transportation and Emergency Control Center
TLD	Training and Logistics Division
TPQ	Threshold Planning Quantity

OVERSIGHT

1.0 Introduction

The Secretary of Energy's Office of Independent Oversight and Performance Assurance (OA) conducted an inspection of emergency management programs at the National Nuclear Security Administration's (NNSA) Office of Secure Transportation (OST) in October 2003. Inspection activities included the observation of the OST annual emergency exercise and reviews of selected emergency management program elements. OA has performed emergency management reviews of OST (formerly the Office of Transportation Safeguards) in 1998, 1999, and 2001.

OST's primary mission is to administer and operate the NNSA transportation safeguards system, which is used to transport nuclear explosives, nuclear components, and special nuclear materials from U.S. Department of Energy (DOE) sites to shippers and receivers throughout the contiguous United States. Although nearly all OST shipments are carried over highways, OST also maintains and operates a fleet of Federally owned aircraft that can be used to transport hazardous materials. OST contracts with Ross Aviation for aviation-related services. OST also maintains fixed facilities that are located on sites managed by other DOE organizations or the Department of Defense. These facilities operate as tenants on the host sites. OST does not handle, store, or conduct operations involving significant quantities of hazardous materials at these fixed facilities. OST activities may also involve transportation to or from host sites, as well as seeking temporary safe haven in such conditionsas adverse weather. OST activities involve various potential hazards that need to be effectively controlled,including exposure to radiation, radiological contamination, and hazardous chemicals.

Section 2 of this report provides an overall discussion of the results of the review of the OST emergency management program elements that were evaluated. Section 3 provides OA's conclusions regarding the overall effectiveness of the OST emergency management program. Section 4 presents the ratings assigned as a result of this review. Appendix A provides supplemental information, including team composition. Appendix B identifies the findings that require corrective action and follow-up. Appendices C through F detail the results of the reviews of individual emergency management program elements.

Overview of the 2003 OST Emergency Exercise "Desert Bighorn"

The exercise scenario simulated the aftermath of an adversary attack on a nuclear weapons convoy on the Nevada Test Site (NTS). Post-attack response activities by OST, NTS, and other Federal agencies comprised the exercise play. For the exercise, real weather conditions were used. The winds were light and variable on a clear morning. Smoke plumes from pre-set fires at the scene of staged vehicles aided the convoy commander in charge in his decision-making. Exercise play was initiated with the convoy commander responding to the scene, which included dead and injured personnel, convoy vehicle fires, damage to vehicles by small arms fire, unexploded ordinance, and potential radiological contamination.

Numerous offsite organizations participated in the exercise. Participants included the OST Transportation and Emergency Control Center and Emergency Operations Center staffs in Albuquerque, the Nevada Operation Office Emergency Operations Center in North Las Vegas, the Explosive Ordinance Disposal team from Nellis Air Force Base, the Federal Bureau of Investigation, the Nye County Sheriff's Department, and the Department of Energy Accident Response Group. The exercise also included limited participation by the DOE Headquarters Emergency Operations Center. Conducting the exercise on an NNSA site is a significant effort and provided the opportunity to test the effectiveness of an integrated OST/NNSA site emergency response, with the participation of multiple agencies.

2.0 Results

2.1 Positive Program Attributes

OST has made progress in addressing many of the emergency management program weaknesses that were identified during four inspections within the past five years. OST continues to improve its capabilities to respond to significant events that have the potential for release of hazardous materials. Recent efforts have included refining response tools to facilitate communication of protective action recommendations, strengthening the capabilities for timely reporting of operational emergencies to DOE and NNSA Headquarters, and cultivating systems for self-identifying and correcting areas needing improvement. These positive attributes of the emergency management program are discussed below.

During the exercise, protective action recommendations were promptly identified and communicated to local responders to provide information needed for protection of site workers and the public. The comprehensive system of protective action recommendation cards covers a wide spectrum of hazardous materials and potential release conditions. The system enables the convoy commander to promptly communicate time-urgent information so that local responders can protect the public. In addition, when supported by appropriate training, the practice of referencing the most conservative protective action card on the trip manifest provides for prompt identification and communication of the protective action recommendations.

The Transportation and Emergency Control Center (TECC) has developed particularly effective programs to support their emergency response functions. Emergency response procedures and checklists used in the 24-hour control center are supportive of timely categorization, notification, and recall of the emergency response organization. These documents are well managed to ensure that up-to-date copies are available. The TECC training program, likewise, is a rigorous and formal process that provides the periodic training necessary to keep personnel proficient, as evidenced in the exercise.

Feedback and improvement programs are effective in addressing needed program improvements identified by both external and internal assessments. OST corrective actions developed in response to the 2001 OA review were, for the most part, responsive to identified weaknesses. Hazards surveys of all OST facilities are now complete, and significant improvements have been made in hazards assessment content. Aviation emergency plans and procedures are in place, the protective action recommendation card process has been enhanced, and the annual emergency exercise planning process now includes written objectives and criteria. Self-assessment efforts are generally effective and have identified needed improvements and action plans. The corrective action management process is responsive to both external and internal evaluations. Actions are based on root cause analysisand risk assessments, and are reviewed quarterly until completed.

2.2 Program Weaknesses and Items Requiring Attention

Despite the improvements noted above, weaknesses were identified in several areas of the OST emergency management program. Concerns about command and control performance during the exercise include those related to on-scene incident command and response interfaces with NNSA sites. Contributing to these performance weaknesses is the need to update implementing procedures and enhance incident command system training programs. While significant improvement was noted in the hazards assessment process, additional rigor is needed to ensure that all materials being transported are appropriately reviewed for emergency management implications.

Command and control weaknesses impacted the emergency response during the exercise. At the scene, the convoy commander

in charge did not appropriately relocate outside of the evacuation zone and co-locate with the Nevada Test Site (NTS) incident commanders. The lack of co-location contributed to significant communication problems between the scene and other response centers. Of particular concern was the time needed to admit the ambulance to the scene to rescue the simulated injured Federal agent, thereby unnecessarily delaying medical treatment. Additionally, there was no enforcement of such directives as the donning of respiratory protection to enter the evacuated area, no immediate control of contamination was implemented, no follow-up activities were taken when the status of responders was unknown, and there was no accountability for responders passing through control points. Contributing to these performance deficiencies are weaknesses in implementing procedures and delays in instituting improvements in the incident command system training programs.

Contamination control continues to be a weakness, as demonstrated during the exercise. Although contamination control was identified as a potential concern by on-scene personnel in the scenario, no control was attempted until a "hot line" was established and radiological control technicians arrived. Prior to that time, all convoy personnel, vehicles, and the general area were potentially contaminated, yet personnel co-mingled with local responders and entered and exited the scene in a van to recover fatalities, and no controls were placed on where these people and vehicles could go afterwards. This weakness had been identified in previous exercises.

Emergency planning processes with host sites has not been effective in achieving a well-executed integrated response, as demonstrated during the exercise. Some of the performance weaknesses observed during the exercise are attributed to planning weaknesses, because existing agreements with the NNSA host sites do not adequately encompass the dual responsibilities of OST and the host site for all emergency management aspects of the response. Specifically, there are no plans describing how the OST incident commander will integrate with the site's incident command system beyond security and how the OST emergency operations center will coordinate with the host site in such areas as consequence assessment efforts and emergency public information. Additionally, communications were ineffective for some time between the OST emergency operations center and the Nevada Site Office emergency operations center because NTS protocols call for a classified mode, while OST's do not, hindering the timely transfer and validation of information.

The OST hazards surveys and hazards assessment process do not ensure that all materials, events, and accident consequences are adequately evaluated This inspection identified one shipment of material that was considerably more hazardous than materials that had been previously assessed. It was found that emergency management staff were not aware of this special-case shipment, and therefore had not performed an emergency management hazards assessment for this activity. Although the potential consequences of releases from this shipment had been analyzed through risk and vulnerability assessments, the activity had not been analyzed to assure that it was bounded by the existing emergency management hazards assessment.

3.0 Conclusions

OA first evaluated the OST emergency management program in 1998 in response to the Secretary of Energy directive to perform an independent review of the status of emergency management programs in the DOE complex. Subsequently, OA conducted follow-up reviews and exercise evaluations in 1999 and 2001 to evaluate the effectiveness of corrective actions. OA's last review of the OST emergency management program was conducted in 2001 and included an evaluation of their annual exercise and a follow-up programmatic review. The 2001 review identified weaknesses in the notification process, contamination control measures, OST and Albuquerque Operations Office interfaces, exercise planning, the feedback and improvement program, hazards surveys, hazards assessments, protective action recommendation cards, and qualification of personnel. Since then, OST has undergone significant internal organizational changes and their concept of operations has changed with the acquisition of the Albuquerque Service Center emergency operation center. This review, conducted in October and November 2003, found improvements in aspects of all previously identified weak areas. Some additional implementation weaknesses were identified during this exercise because it tested elements of the OST emergency management program that interface with a host NNSA site.

The most significant improvements in the OST emergency management program are the content of the hazards assessment document; the additional staff expertise that has been assigned to foster improvement in the emergency management hazards surveys and assessments; and the overall effectiveness of the feedback and improvement program to address identified weaknesses. Several other improvements include completion of hazards surveys for all OST facilities and activities; development of comprehensive aviation emergency plans and procedures; and enhancements to the protective action recommendation process. OST is continuing to develop additional upgrades of the emergency management plan to meet NNSA guidelines and improve emergency management training effectiveness. The exercise demonstrated that the OST emergency response organization could effectively provide for prompt event categorization, DOE and NNSA notification, and protective action recommendations to local responders for the protection of workers and the public at the onset of an operational emergency.

Many elements of the emergency management program are effectively implemented. However, the exercise identified significant weaknesses in event scene command and control. These weaknesses resulted in a delay in the rescue of an injured person; personal protective equipment not being worn by all responders; no accountability of responders; unclear status of response assets; and ineffective contamination controls during the exercise at NTS. Many of these emergency response performance weaknesses have origins in procedural and training program deficiencies. In addition, weaknesses in host site interface agreements contributed to ineffective coordination of response activities and poor communications.

A programmatic review of the emergency management hazards assessment process found that it does not ensure that all hazardous materials are appropriately reviewed and analyzed to ensure that existing assessments effectively bound the activity, particularly in the instance of unusual, non-standard cargos.

It is recognized that this is the first exercise of this type, using a scenario involving an OST emergency event on a host site, and represents a positive step forward in improving an integrated and effective response capability. The exercise was conducted safely and was effective in exposing weaknesses that can now be addressed. In doing so, NNSA, OST, and host sites should consider a wide application of these lessons learned to address the shared responsibilities, and not only as OST and NTS interface issues.

4.0 Ratings

This inspection focused on a detailed assessment of five key emergency management programmatic elements, divided into four major element categories. No overall program rating has been assigned. The individual element ratings reflect the status of each OST emergency management program element at the time of the inspection.

The ratings for the individual program elements evaluated during this inspection are:

Emergency Planning

Hazards Surveys and Hazards Assessments ..... NEEDS IMPROVEMENT
Program Plans and Procedures ..... NEEDS IMPROVEMENT

Emergency Preparedness

Training and Drills ..... EFFECTIVE PERFORMANCE
Exercise Planning, Control, and Evaluation ..... EFFECTIVE PERFORMANCE

Emergency Response

Command and Control, Emergency Response Organization,
and Response Interfaces ..... NEEDS IMPROVEMENT
Categorization, Communication, and Notifications ..... EFFECTIVE PERFORMANCE
Protective Actions for Site Workers and the Public ..... EFFECTIVE PERFORMANCE
Protective Actions and Reentry for Responders ..... NEEDS IMPROVEMENT
Consequence Assessment ..... EFFECTIVE PERFORMANCE

Readiness Assurance

Assessments and Corrective Action Management ..... EFFECTIVE PERFORMANCE

APPENDIX A
SUPPLEMENTAL INFORMATION

A.1 Dates of Review

Scoping Visit	September 22 - 26, 2003
Onsite Inspection Visit	October 20 - 31, 2003
Report Validation and Closeout	November 12 - 15, 2003

A.2 Review Team Composition

A.2.1 Management

Glenn S. Podonsky, Director, Office of Independent Oversight and Performance Assurance
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Charles B. Lewis, Director, Office of Emergency Management Oversight

A.2.2 Quality Review Board

Michael Kilpatrick
Dean Hickman
Bob Nelson

A.2.3 Review Team

Charles B. Lewis, Director, Office of Emergency Management Oversight (Team Leader)
JR Dillenback
Bob Nelson
Tom Rogers
David Schultz
Doug Trout

A.2.4 Administrative Support

Anna Lucero
Kim Zollinger

APPENDIX B
SITE-SPECIFIC FINDINGS

Table B-1. Site-Specific Findings Requiring Corrective Action Plans

FINDING STATEMENT	REFER TO PAGES:
1. The OST process for hazards surveys and hazards assessments does not analyze all hazardous materials or consider the spectrum of events and accident consequences as required by DOE Order 151.1A.	10
2. The NNSA and OST emergency planning process does not integrate roles and responsibilities with those of the host sites to establish effective control at the event scene or integration of local agencies or organizations as required by DOE Order 151.1A.	12
3. The OST EOC and convoy standard operating procedures are not current, and procedures are not specific enough to promote a safe and effective emergency response, as required by DOE Order 151.1A.	13
4. The OST training programs do not ensure that all emergency response organization members have received the training required in key areas, such as task-specific training for the EOC cadre and incident command training for Federal agents as required by the OST Emergency Management Plan and Emergency Management Training Plan.	17
5. OST responders did not establish an effective unified incident command system that provided command and control of the response to mitigate event consequences as required by DOE Order 151.1A.	26
6. Protective actions in the form of contamination controls, establishing command in a safe location, ensuring that responders don respiratory protection, and establishing responder accountability were not implemented by OST personnel during an exercise, as required by DOE Order 151.1A.	28

APPENDIX C
EMERGENCY PLANNING

C.1 Introduction

Emergency planning consists of identifying hazards, threats, and hazard mitigation mechanisms; developing and preparing emergency plans and procedures; and identifying personnel and resources needed to ensure an effective emergency response. Key elements of emergency planning include developing a hazards survey and emergency planning hazards assessment to identify and assess the impact of site and mission-specific activity hazards and threats. Based upon the results of these assessments, U.S. Department of Energy (DOE) sites and facilities must establish an emergency management program that is commensurate with the identified hazards. The emergency management plan defines and conveys the management philosophy, organizational structure, administrative controls, decision-making authorities, and resources necessary to maintain the comprehensive emergency management program. Specific implementing procedures are then developed that conform to the plan and provide the necessary detail, including decision-making thresholds, for effectively executing the response to an emergency, regardless of its magnitude. These plans and procedures must be closely coordinated and integrated with offsite authorities that support the response effort and receive emergency response recommendations from the site/facility.

This Office of Independent Oversight and Performance Assurance (OA) evaluation included a review of Office of Secure Transportation (OST) hazards surveys and hazards assessments, the OST emergency plans, and the associated implementing procedures. The focus of this section was on the guidance and tools derived from hazards assessments that are provided to initial decision-makers in protective action formulation, event categorization/classification, and offsite notifications.

C.2 Status and Results

C.2.1 Hazards Surveys and Hazards Assessments

The 2001 OA review determined that only limited progress in the area of hazards surveys and assessments had been made since the previous evaluation in 1999. Surveys were not performed, and assessment weaknesses prevented OST from forming a comprehensive, technically accurate basis upon which elements of the OST emergency management system could be constructed. Furthermore, mechanisms and staff expertise were unavailable to upgrade and maintain accurate surveys and assessments reflective of current hazards. Since that evaluation, the OST has completed surveys for all fixed facilities and activities, and significantly improved the quality and content of the hazards assessment, with some exceptions.

A significant positive change noted is in OST staffing expertise to support preparation and maintenance of the hazards surveys and assessments. A full-time employee with appropriate career qualifications as a health physicist has been retained to fulfill this role. Furthermore, this individual received training specific to hazards surveys and assessments, sponsored by DOE Headquarters (a week-long course). This investment should result in continued improvement in the quality of hazards surveys and assessments.

Hazards Surveys

In the past two years, OST completed six hazards surveys that cover the fixed facilities and activities under their cognizance. The surveys generally include the attributes required by DOE Order 151.1A as further amplified by the emergency management guide. Information such as generic emergency conditions that can affect the facility, occupancy, and applicable emergency planning requirements are tabularized for easy information access. Although fixed-facility surveys identified the presence of hazardous materials, no inventories in excess of regulatory threshold planning quantities (TPQ) were noted. The hazards survey for over-the-ground and air transportation activities identified hazardous materials exceeding the TPQ and appropriately dictated the need for further assessment. One hazards survey, for aviation facilities, documented the inventory of material present and the associated TPQ in tabular form, enhancing the document's usefulness for emergency planning and response.

The remaining fixed-facility hazards surveys did not properly screen hazardous materials located within

the facilities. For example, the hazards survey for the Southeastern Courier Section Facilities screened from further assessment an unknown quantity of explosives in two buildings based on the criterion, "Material is commonly used by the public." Similarly, the Transportation Safeguards Training Center hazards survey screened out the ammunition magazine and supply point materials based on "below screen thresholds." In the first example, explosives are not in common use by the public; in the second example, regulatory screening thresholds are unavailable for explosives and/or ammunition, so derived TPQs based on protective action criteria should have been computed to determine whether the inventories required further assessment. OST has not performed these computations, and therefore some hazardous materials at OST fixed facilities require further analysis before a determination can be made that hazards assessments are not required.

Hazards Assessments

A complete revision of the OST hazards assessment was published in June 2002, correcting most of the findings and weaknesses from the 2001 OA review. Improvements included combining air and over-the-ground assessments for the materials at risk into one document, addressing various cargos such as uranium through the use of various amounts of surrogate materials, and determining event consequences for the wide range of inventories transported under a wide range of dispersion conditions to assure that worst case as well as average conditions are documented. Consequences from analyzed events are conservatively calculated since no credit is taken for the mitigating effects of containers or transport vehicles. Additionally, consequences at most receptor distances of interest for multiple events are tabularized and annotated when protective action criteria are exceeded, significantly increasing the utility of the document as a planning and response tool.

However, other conditions that warranted further documented analysis are not contained in the existing hazards assessment:

- The consequences of events are not calculated at 30 meters; this value is necessary to provide potential host sites the information necessary for categorization/classification decision-making through their emergency management program.

- The outreach to host sites has improved by providing them with copies of the hazards assessment and other supporting documents, but this effort has been informal and does not ensure that sites have factored the results of the OST hazards assessment into their emergency management program. Formal transmittal of the OST documents to site offices is necessary to assure that the site contractor is directed by and receives authority from the cognizant contracting officer to incorporate the results of the OST hazards assessment into site documents.

- The OST 2003 annual review resulted in potentially deficient conditions that necessitated changes to the hazards assessment, but the assessor merely documented the conditions as an informal memorandum to file instead of determining whether an hazards assessment revision was warranted.

- The technical content of the hazards assessment was improved by including malevolent acts, including a range of malevolency that addressed events from low consequence to the most severe consequence, but not all events are appropriately screened or assessed. For example, nuclear detonation resulting from criticality was not assessed based on the statement that "design and passive safety features of weapons … effectively preclude a nuclear yield from any transportation accident." "Effectively" is not quantified, and review of applicable literature indicates probabilities that are not impossible; thus, the event requires a documented assessment.

- The hazards assessment documents that large amounts of explosives are transported by OST and acknowledges that toxic fumes or gases may result from detonation or burning. The hazards assessment assumes that the effects of the blast and flying debris injury constitute the bounding consequence and, furthermore, that this consequence is bounded by the protective action distances stated in the 2000 Emergency Response Guidebook, which is based only on blast effects. OA reviews at other sites have found that these assumptions do not translate into adequate protection; thus, documentation of a more thorough assessment is warranted.

OA also noted weaknesses in the current hazards assessment maintenance process, when changes occur that require screening and possibly a quantitative assessment. An OST change control process has been

implemented to ensure that significant changes in OST operations are analyzed and that informed decisions regarding implementation of the proposed change are assured to maintain OST activities within approved safety criteria. Criteria are established to identify areas, such as risk assessments and nuclear explosives safety, that should be subjected to evaluation of acceptability of proposed changes. However, current criteria are not sufficiently definitive or specific to assure that changes in transported materials that may exceed currently assessed hazards are addressed in shipment-specific hazards assessments. For example, an unreviewed safety question may initiate the process. However, if the proposed activity does not exceed an unreviewed safety question threshold, which may be very high relative to hazards assessment thresholds, emergency management staff will not be notified to perform the assessment. Thus, the activity could be initiated, but existing hazards assessment conclusions would not bound the potential consequences of the new activity.

Finding #1: The OST process for emergency management hazards surveys and assessments does not analyze all hazardous materials or consider the spectrum of events and accident consequences as required by DOE Order 151.1A.

To check the effectiveness of the existing change and inventory mechanisms for control of OST shipments and to confirm that the hazards assessment accurately reflected the hazardous material that is transported, OA conducted a review of recent shipments. While several shipments contained inventories consistent with the hazards assessment, one shipment in May 2003 moved material (Pu-238) that was considerably more hazardous than the material assessed in the hazards assessment (Pu-239). Emergency management staff were not made aware of the shipment, and therefore did not perform a hazards review for this special-case cargo. Other technical experts performed a review that determined the potential consequences of events involving the shipment and the special measures to be implemented to protect the shipment against the then current design basis threat. These measures were employed during the movement to provide for secure transportation of the material.

Revisions of the change control system are currently under review by OST. Proposed revisions, such as "if a particular shipment has not been made within the past one year, ensure that emergency management division reviews the proposed shipment for consistency with current planning," are being considered to assure that the hazards assessment accurately reflects the consequences of the proposed activity. Such revisions will further enhance the hazards assessment process by familiarizing safety analysis personnel with the hazards assessment contents and promoting close communications with emergency management staff. Emergency management staff will be included in a multidisciplinary team of technical experts to assess such shipments.

The hazards assessment document could be further enhanced as a consequence assessment tool by including a description of differences between the dispersion model used in the hazards assessment document and the dispersion model used in the OST emergency operations center (EOC) during a response. The dispersion modeling employed in the HA is HotSpot, a straight-line gaussian model, which is not as sophisticated as the National Atmospheric Release Advisory Capability (NARAC) used in the EOC and, consequently, yields different results. Such differences require documentation to prevent confusion during a response and ensure consistent results among timely initial consequence assessment activities using the hazards assessment and ongoing consequence assessment activities using NARAC.

In summary, OST has made continued progress in preparing the documents that form the basis for building the balance of the OST emergency management system. One qualified staff member is now available, and facility and activity hazards surveys are complete. These provide the foundation for an effective emergency management program and a basis for performing a quantitative hazards assessment. The combined ground and air operations hazards assessment document contains evaluations for most hazardous materials, analysis for most accident scenarios, and conclusions necessary to develop the decision-making tools used during an emergency response. However, the survey process allowed improper screening of some hazardous materials, and the hazards assessment document does not contain potential accident consequences of all transported materials or adequately address all events that may affect shipments. Furthermore, mechanisms are not fully in place to assure that all future shipments are properly assessed and that all planning and preparedness requirements are fulfilled before material movement.

C.2.2 Program Plans and Procedures

During the 2001 OA review, it was determined that the Emergency Management Plan (EMP) contained many weaknesses and inconsistencies with implementing procedures, decision-making logic diagrams, and protective action cards, and emergency action levels (EALs) were not always consistent with the hazards assessments. Since that evaluation, OST has made significant progress in responding to these weaknesses, particularly in the revision of the EMP, transformation of EALs, and expansion of the scope of analyzed events covered by the protective action cards.

Plans

The overall OST emergency plan consists of two primary plans: an EMP prepared by the NNSA OST Emergency Management Branch (EMB), covering fixed facilities and over-the-ground transport events; and a plan prepared by the NNSA Aviation Operations Division (AOD), covering air transport events, along with other subordinate plans such as an Emergency Response Operations Plan (which focuses on the Emergency Operations Division response). Collectively, these plans adequately describe the scope of the planned OST emergency response.

The aviation plan represents a significant improvement in the overall OST emergency planning effort. It now provides a description of the concept of operation and associated roles and responsibilities. AOD assumed emergency management program responsibility in late 2002, and initiated the task of defining the roles and responsibilities of AOD in coordination with EMB. An approved aviation emergency management plan with implementing procedures was issued in September 2003. The concept of operations described in the plan directs the aviation dispatcher to notify the aviation duty officer, both of which are 24-hours-per-day positions, of any event affecting an NNSA flight. The aviation duty officer notifies the Transportation and Emergency Control Center (TECC), also staffed 24 hours per day; this action initiates the categorization and notification process and OST EOC recall, if applicable, as described below for all events. The OST Federal officer accompanying secure shipments is the Senior Energy Official, which joins the unified incident command system established with local responders. These actions are adequately detailed in implementing procedures that provide specific direction to the dispatcher and duty officer in responding to a wide range of off-normal events. Additionally, worldwide communication capabilities from pilot and passengers will soon be available on all aircraft, and the dispatcher emergency telephone number is included with the flight plan for use by air traffic controllers.

The EMB EMP is much improved through correction of most previously-identified weaknesses. It has been revised to meet the scope and format contained in DOE guidelines, and it undergoes annual reviews and updates. EMB is significantly revisingthe plan to address the transition from use of the situation room to the recently acquired OST EOC. This revision will reflect the changes in position roles and responsibilities since OST personnel replaced Albuquerque Operations Office personnel in the OST EOC earlier this year. The revision will be a part of the annual review and update and is expected to be complete in December 2003.

The one area of the EMP that has not been corrected since the 2001 OA review concerns the criteria used by OST personnel to recommend emergency classifications to host sites. The criteria do not accurately describe the limits and distances provided by existing guidelines for classifying events. Furthermore, these incorrect/incomplete limits have been incorporated into a notebook for use in the TECC as the tool to implement event classification recommendations. Since event classification is not required for offsite events and is the host site's responsibility for onsite events, this function is not required of the TECC. Additionally, TECC personnel do not have the equivalent training and experience in event classification and are not as familiar with this function as personnel at host sites, and they are not as familiar with the site geography, topography, or demographics. The important role of OST in event classification is communicating to the site the recommended protective actions and the distances from the scene to which they apply, for the shipment involved. This information is currently provided through the protective action recommendation (PAR) card process, and therefore, TECC recommendations on event classification do not make a significant contribution.

The most significant planning weakness that impacted the response observed during the exercises was the integration of response organizations. The EMP addresses interface planning with host sites through the establishment of detailed agreements. However, the existing agreement between OST and

the Nevada Test Site (NTS), Nuclear Explosives Convoy by Safe Secure Trailer on NTS, revised September 12, 2000, does not extend beyond the security aspects of the response. Consequently, many of the response weaknesses observed during the exercise can be attributed to not having the requisite plans and procedures in place. Specific weak areas that can be improved by defining roles and responsibilities and the concept of operations include unified command, coordination of OST and host site emergency public information releases (see Appendix E), use of classified or unclassified modes of communications between venues, and how host sites will coordinate with OST to perform consequence assessment and interpret results with a classified source term if they do not have classified systems or appropriately cleared personnel to perform this function.

Finding #2: The NNSA and OST emergency planning process does not integrate roles and responsibilities with those of the host sites to establish effective control at the event scene or integration of local agencies or organizations as required by DOE Order 151.1A.

Procedures

EMP implementing procedures (EPIPs) consist of a collection of procedures, checklists, and other references used at the various response venues. OA reviewed EPIPs for the TECC, on-scene convoy command, and the OST EOC. For the most part, each group owns its EPIPs and establishes its own programmatic requirements for development, maintenance and control, since they are organizationally in different offices or divisional branch offices. The requirements vary significantly in procedure identification, review, approval, and distribution control, as discussed below.

Several recent improvements in tools for formulating PARs have been implemented, including significantly more detail in decision-making trees portrayed on alpha-numerically annotated weather-proof cards and the addition of the recommended PAR card number for worst-case accident consequences to the trip manifest. The trip manifest also lists the applicable 2000 Emergency Response Guidebook number(s) to assist personnel in prompt identification of hazards and appropriate response information. Nevertheless, there is room for different interpretation in the PAR card selection process. Since each venue has its own training program and some terms are not well defined, inconsistent interpretation is not unexpected and, in fact, was observed during the exercise and follow-up interviews. For example, in the exercise scenario, the tractor fire did not represent the analyzed event for the PAR cards, which were developed for a trailer fire. Additionally, the difference between a breached trailer and an intact trailer is ambiguous enough that personnel who were interviewed could not clearly discern which PAR card set should have been implemented during the exercise. The PAR cards contain a significant difference in the distance (from one-halfmile to ten miles) within which protective actions should be taken, and the appropriate PAR cards must be selected in a time-urgent environment.

The TECC EPIPs support prompt categorization, notification, and formulation of PARs at the shipment level and are maintained current by a rigorous process. It begins with pre-designating the event categorization to event-specific checklists and linking the hazard and protective actions through the trip manifest. The TECC EPIPs are formally approved and contain unique identifiers and revision designators to ensure that approved and up-to-date documents are used. A web-based document list is available to authorized users to validate the latest procedure revisions. A sample of TECC procedures in use was compared to the document list, and all were found to be current. The TECC EPIPs are user-friendly, well organized into the three TECC functions – 911, OST mission, and Service Center – and further organized by event type. TECC EPIPs are sufficiently detailed to guide trained TECC personnel in implementing their emergency response duties, as demonstrated during the exercise.

The OST EOC EPIPs consist of procedures, logic diagrams, and checklists that adequately encompass the scope of OST EOC functions but are not all governed by a program that sets requirements for EPIP development, approval, maintenance, and distribution control. These EPIPs give the Emergency Response Duty Officer, a 24-hour-per-day position, a systematic approach for making OST EOC recall decisions and identifying appropriate checklists to address the full spectrum of potential events. As OST EOC personnel arrive, they implement tasks using position-specific notebooks maintained in the OST EOC. The OST EOC position notebooks are a compilation of documents that are either developed within EMB or are provided by organizations external to EMB. However, some of these documents do not have unique identifiers or revision numbers or an equivalent process to determine

whether they are up to date. Similarly, there is no process in place to determine whether the notebooks contain current copies of documents provided by external organizations. As a result, the OST Emergency Manager's notebook was found to contain out-of-date materials, such as the categorization and classification determination methodologies. The use of approved and up-to-date documents is fundamental to an effective emergency management program to ensure the use of complete and accurate information and proper execution of tasks in a time-urgent environment, particularly when integrated with other OST EOC members or venues that may be using different documents or document revisions.

The convoy standard operating procedures (SOPs) are formally approved and controlled and have written maintenance requirements. However, they are not kept up to date and do not provide sufficient detail to implement emergency response tasks by trained Federal agents, as demonstrated during the exercise. This set of procedures typically sets *what* is required but provides no amplifying instructions on *how* to implement an effective program. The following instructions are not included in the procedures, and their absence contributed to observed weaknesses during the exercise:

- Co-locating the convoy commander in charge with site responders to establish an effective unified incident command
- How to select a safe incident command post location
- How and when to establish contamination control
- How to establish area entry control
- How to identify the incident commander and attendant Federal agents
- What type of information to record in activity logs.

Although on-scene convoy personnel consulted derivative checklists instead of these procedures, familiarity with how to implement these important functions, and thereby implement an effective response, could be achieved through a combination of training and additional written instructions to the level necessary to achieve the desired result.

Furthermore, the convoy SOPs have not been updated for several years and do not reflect current information, such as OST organizations and, more significantly, the current PARs used in the PAR card system. Although the maintenance requirements for these documents include a process for making revisions, they do not require periodic reviews and updates. OST is aware that these procedures are out of date and has had plans to update the documents, but other priorities have diverted their limited resources.

Finding #3: The OST EOC and convoy standard operating procedures are not current, and procedures are not specific enough to promote a safe and effective emergency response, as required by DOE Order 151.1A.

In summary, OST has developed adequate plans and implementing procedures that support prompt decision-making regarding formulation of recommended protective actions, categorization, notifications, and recall of response personnel. However, roles and responsibilities and concepts of operation in implementing an integrated response among OST and host sites are not defined, and further consideration of OST's role in classifying events is warranted. Additionally, the PAR card selection tools are subject to interpretation. Finally, the convoy SOPs are not up to date and lack specificity, contributing to performance weaknesses observed during the exercise.

C.3 Conclusions

Since the OA review in 2001, the hazards surveys, hazards assessments, and plans and procedures have improved through a focused effort to address identified weaknesses. The hazards surveys are now complete for all fixed facilities, and the hazards assessment document contains additional information. An aviation emergency plan and implementing procedures are now in place to complement the fixed-facilities and over-the-ground emergency plans. Implementing procedures are in place to enable prompt categorization, notification, and identification of PARs. However, the hazards survey and hazards assessment do not completely document the reviews and analysis, and the program does not ensure that all process changes undergo the appropriate analysis. Furthermore, the hazards assessment document and many of the procedures are not current. Finally, some plans and procedures lack the necessary detail to promote an effective response, particularly where the OST emergency program integrates with site emergency program.

C.4 Rating

A rating of NEEDS IMPROVEMENT is assigned to the area of hazards surveys and hazards assessments.

A rating of NEEDS IMPROVEMENT is assigned to the area of program plans and procedures.

C.5 Opportunities for Improvement

This Independent Oversight inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are intended to be reviewed and evaluated by the responsible line management and accepted, rejected, or modified as appropriate, in accordance with site-specific programmatic objectives and priorities.

- Improve the quality and accuracy of the hazard surveys and assessments for all OST facilities and activities.
  - Consider developing a standard for conducting hazards surveys and hazards assessments based on DOE orders and guidance that is specific to OST facilities and activities. Establish mechanisms to conduct required periodic reviews of surveys and assessments, and to ensure that hazards are surveyed and assessed prior to initiating any activities not previously analyzed.
  - Institute formal memoranda of understanding between OST and host sites to clearly define roles and responsibilities for hazards surveys and assessments, assessment output products, and decision-making for OST shipment events that may occur on a host site.
  - Ensure that hazards surveys identify all hazardous materials and appropriately retain or screen materials based on accurate criteria, and document the results of the screening process. Enhance the utility of surveys by presenting a tabular listing of material inventory, the TPQs, and the associated protective action criteria.
  - Establish a multidisciplinary team to perform and review hazards assessments and ensure their accuracy. Ensure that hazards assessments: (1) address all potential hazards and initiating events associated with OST activities, (2) include sufficient technical detail to support assessment conclusions, and (3) provide sufficient information for emergency planners and responders to incorporate into plans, implementing procedures, and response activities.
  - Consider utilizing NARAC for consequence assessment modeling and archiving results of hazards assessment event scenarios to minimize differences between planning and response assessment results, and to minimize the length of time for event-specific consequences to be available to emergency response organization members during a response.
- Consider the following enhancements to the emergency response planning effort.
  - Remove, from the EMP, the provisions to provide classification recommendations to sites. If this is not desirable, revise the EMP and EPIPs to reflect the standard criteria used for defining Alerts, Site Area Emergencies, and General Emergencies.
  - Expand or develop agreements with sites to plan important functions that focus on an integrated response. Establish organizational and position roles, responsibilities, and methodologies (such as communications systems to use and how to perform consequence assessments when classified information is not compatible with site capability).
  - Coordinate incorporation of hazards survey and assessment documentation and results into site response procedures and tools.
- Eliminate some of the inconsistencies in utilizing the PAR card selection process, beginning with the following recommendations.
  - Define key words used in the logic diagrams, such as “breach,” and provide consistent training on the definitions to all users.

  - Include additional descriptors in the logic diagrams to more clearly indicate the event from which they were derived.

- Improve the EPIP program and procedures by establishing requirements and amplifying instructions that promote an effective response using current methodologies as suggested below.

  - Establish and implement program requirements for the development, approval, maintenance, and configuration and distribution control for OST EOC EPIPs.

  - Provide additional amplifying instructions to describe effective methods in implementing convoy SOP requirements.

  - Update TECC, OST EOC, and convoy SOPs to reflect current concepts of operation, new or consolidated emergency response organization positions, and the current PAR cards, as applicable.

APPENDIX D
EMERGENCY PREPAREDNESS

D.1 Introduction

A coordinated program of training, drills, and exercises is necessary to ensure that emergency response personnel and organizations can effectively respond to emergencies impacting the site or facilities. This response includes the ability to make time-urgent decisions and take action to minimize the consequences of the emergency and to protect the health and safety of responders, workers, and the public. To be effective improvement tools, exercises should be used to validate all elements of an emergency management program over a multi-year period using realistic, simulated emergency events and conditions, and to provide emergency response organization members an opportunity to practice their skills.

The Office of Independent Oversight and Performance Assurance (OA) team evaluated the training, drill, and exercise program implementation used to support the emergency response organizations at the institutional and facility levels of the Office of Secure Transportation (OST). As part of the programmatic review of the training, drill, and exercise elements, the OA team evaluated the plans and procedures that support these elements and reviewed training and proficiency records for key OST emergency responders. Drill reports were also reviewed for indications that they are being used effectively to enhance responder proficiency and evaluate the level of the OST's response preparedness.

D.2 Status and Results

D.2.1 Training and Drills

During the 2001 exercise evaluation, OA determined that OST had not ensured the provision and availability of personnel with sufficient expertise to implement an emergency management program. Since that evaluation, OST has initiated on-the-job training (OJT) as a systematic method of providing and documenting job skills training. OST utilizes the Lesson Plan Review Committee to review all lesson plans and has developed a comprehensive training program for the Transportation and Emergency Control Center (TECC). For 2004 implementation, OST drafted career path design documents that include job task analysis and task-to-training matrices for convoy, vehicle, and unit commanders. The design documents include not only the tactical mission but also the emergency management component dealing with protective actions for workers and the public.

OST has done significant work to establish and promote an effective training program. The OST emergency training program is described in the Emergency Management Plan, Emergency Management Training Plan, TECC Training Plan, and the fiscal year 2004 Office of Mission Operations Training Program Plan. Together, these documents describe the current program implementing process as well as part of the path forward during OST's program transitions. In the area of training, these documents cumulatively establish broad program requirements, such as those for emergency response organization initial training courses, specialized agent training, and performance-based and written testing. The proposed instructional systems development process to integrate these systems is also described. However, as discussed further below, emergency management training is not currently integrated into the overall OST training program.

The OST Emergency Management Plan assigns responsibility for the coordination of training to the OST emergency program specialist within the Emergency Management Branch (EMB). OST emergency operations center (EOC) cadre training is the responsibility of the EMB. The EOC in Albuquerque is transitioning from an Albuquerque Operations Office-managed organization to OST personnel, and changes are also being made in the facility structure. During this transition, EOC cadre training consists of orientation sessions on equipment, followed by performance-based graded drills. However, there is no approved task-specific training or qualification program for the OST EOC cadre. Steps to improve this training program are in progress. For example, EMB is drafting formal OJT training modules for EOC members that, when implemented and approved, are expected to be incorporated into the overall training program administered by Training and Logistics Division (TLD). Two other important program attributes need attention: 1) OST EOC training is tracked by each individual trainer and is not integrated in a way that facilitates

determining the status of qualifications, and 2) the OST EOC cadre suffers from a significant turnover rate, putting a further load on training resources.

TECC subject matter experts, with EMB support, train the emergency operations specialists who staff the TECC. This substantial training program is well detailed and documented. It identifies personnel and instructor responsibilities; defines training types and methodologies; and contains a job task analysis, required courses, prerequisites, required reading, and activities. The program also contains additional positive attributes, such as:

- Performance evaluations and criteria for successful course completion are established, and performance-based evaluation of drills are conducted quarterly.
- An initial four-week "core" skill training provides a good combination of classroom and hands-on instruction for practical application of basic tasks.
- Refresher training includes OJT and annual web-based training, and participation in one drill or exercise.
- Training is developed and provided by subject matter experts (onsite and at Sandia National Laboratories).
- Standardized weekly training meetings present changes in plans and procedures and lessons learned to the emergency operations specialists.
- Annotated listings of courses and the training course objectives are detailed and centralized.
- Effective qualification tracking follows the format of the OST Qualification Training System. (TECC plans to incorporate their qualification tracking into the electronic OST Qualification Training System administered by TLD before the end of 2003.)

Federal agents are trained by various organizations on some elements of emergency management, and for the most part this training is coordinated by TLD. The convoy commander serves as the initial incident commander (IC), coordinating the activities of multiple response elements at the scene. This individual also serves as the Senior Energy Official. In this position the convoy commander in charge (CCIC) must develop unified command with site and local responders and issue recommended protective actions for site workers and/or the general public. CCICs receive one-hour, web-based courses in protective actions and the incident command system (ICS). While the protective action course content is adequate, the ICS course does not adequately address emergency management processes, such as unified command, roles and responsibilities of the ICS safety officer, and responsibilities of the Senior Energy Official. Moreover, neither operational readiness training nor the agent candidate training includes emergency management elements. The exercise demonstrated weaknesses in safety officer functions and the integration of OST with the site ICS. In response to OST's recognition of weaknesses in the training for convoy commanders, EMB developed a draft 40-hour emergency management task list for ICs. This list delineates U.S. Department of Energy (DOE) Order 151.1 requirements and outlines key elements of a comprehensive emergency management program. Although the task list was developed in June 2003, it has not yet been adopted for inclusion in the TLD training program.

Finding #4: The OST training programs do not ensure that all emergency response organization members have received the training required in key areas, such as task-specific training for the EOC cadre and incident command training for Federal agents as required by the OST Emergency Management Plan and Emergency Management Training Plan.

The OST drill programs complement the various components of the emergency response organization training described above. The drill program, as described in the Emergency Management Training Plan, provides for periodic drills for all workers who may be required to take protective actions. Drills are evaluated and include procedure usage, the recall system, building evacuations, and emergency response. TECC and OST EOC drills are conducted at least quarterly, and OST sometimes participates in host-site drills. Reviews of TECC drill records, including the CCIC position, indicate that drill objectives are clearly established and reports are well documented. Additionally, the annual requalification requirement for the emergency response organization to participate in at least one drill or exercise is being met.

In general, OST has improved and continues to improve the various components of the emergency response organization training program. However, the multiple training components within OST are not fully documented, and there is no coordinated description of

overall goals and objectives. Additionally, these program components lack centralization of training and drill records. Thus, programmatic details regarding lesson plans, qualification programs, and training records must be gleaned from the various departments and contractors (i.e., Honeywell, SAIC, Wackenhut). Because OST training is not integrated, instruction resources are not prioritized to ensure that all emergency response organization members receive the required training.

In summary, OST has continued to improve the emergency management training and drill program. Some components of the program are well structured, implemented, and documented. Specifically, the TECC training program includes many positive attributes, such as performance evaluations for training and drills; appropriate use of classroom, OJT, and web-based training methods; and weekly training meetings that inform personnel of procedure changes and lessons learned. Progress is also being made to develop more comprehensive training for the OST EOC functions that were recently transitioned from the Albuquerque Operations Office. Drills are of sufficient number and quality to keep the emergency response organization up to date on the transitions of the program. However, ICS training does not adequately prepare the CCICs for their roles and responsibilities in an emergency, particularly with regard to unified command and the roles and responsibilities of the ICS safety officer and Senior Energy Official positions, as demonstrated by the exercise.

D.2.2 Exercise Planning, Conduct, and Evaluation

During the 2001 exercise evaluation, OA determined that OST had not developed an exercise that represented an objective test and demonstration of NNSA's capability to respond to an OST transportation emergency due to weaknesses in exercise planning, conduct, and control. This evaluation found that OST has made progress in their efforts to build an effective and structured approach to planning, conducting, and evaluating an exercise**.** The 2003 exercise, "Desert Bighorn," presented a credible transportation scenario on an NNSA site, the Nevada Test Site (NTS). This was the first OST exercise of this type and was administered using objectives with measurable criteria that were developed for evaluators to perform an objective assessment of emergency responder performance. Conducting the exercise on an NNSA site is a significant effort and provided the opportunity to test the effectiveness of an integrated OST/NNSA site emergency response, with multiple agency participation.

The exercise planning and associated documentation included important attributes (not included in the 2001 exercise) that demonstrated improvement in OST's approach to conducting an emergency management exercise. This improved approach included a comprehensive plan and scenario narrative, evaluation methodologies, exercise goals, timelines, rules of conduct, prepared inject messages, exercise restrictions, and training requirements. The plan included an extensive array of participating organizations representing OST, DOE, NNSA, NTS, and other organizations external to DOE. Participating organizations from OST included the OST convoy, the TECC, and the OST EOC (which was staffed with OST personnel for the first time since its transition from the Albuquerque Operations Office). Participating organizations from NTS included the NNSA/Nevada Site Office EOC; the Bechtel Nevada Emergency Management Center; the NTS Tactical Operations Center; NTS responders for protective force, fire, medical, hazardous material, consequence assessment, and field monitoring; and the NTS Joint Information Center. External participation included the DOE Headquarters EOC, the Nye County Sheriff's Department, the Federal Bureau of Investigation (FBI), the Nellis explosive ordnance disposal (EOD) team, and the DOE Accident Response Group (ARG).

Early stages of planning for the exercise commenced approximately one and a half years prior to the exercise date. Members of the OST exercise planning team met with the Nevada Site Office, Bechtel Nevada, DOE, NNSA Headquarters, and other Federal agencies to determine the size and scope of the exercise, the organizations that would participate, and the degree of exercise participation and associated objectives. Altogether, approximately 20 participants were involved from initial inception of exercise planning and design through the final design stages. A few months before the exercise, detailed planning for the exercise was limited to a few core staff.

All exercise participants acted in a professional manner and participated as if all events were real. Responders were allowed significant free play to carry out their emergency response duties, such as selecting locations for incident command posts, road blocks, and staging areas based on real weather; the dispatch and control of responding fire and medical units; and the

callout of the assets (e.g., helicopter, DOE ARG, RAP, FBI, and EOD). Controllers/evaluators facilitated exercise play but did not prompt players or provide unearned exercise information.

The execution of the exercise had some weaknesses resulting from not enforcing rules of conduct, or not providing adequate information and training to all participants. For example, at the start of the exercise, the CCIC was not provided with fully accurate and comprehensive information as part of an initial scenario inject message. Therefore, because the CCIC did not know what the initial conditions of the convoy were, he did not have an accurate baseline for making informed decisions. Additionally, OST EOC controller briefings were not provided prior to OST EOC participation. Therefore, OST EOC participants assumed all agencies would be responding and that there would be no simulation, when in fact the RAP program was simulated. Conduct-of-exercise rules were not enforced or reviewed during the exercise, including using the statement "this is an exercise" before and following communication transmissions; not identifying Federal agents by name over the radio and electronic status boards; and not driving vehicles off road (convoy vehicles and the FBI and DOE ARG vehicles drove to the CCIC incident command post on the hill). The off-road travel was an environmental concern that was a prohibited activity discussed in the exercise training.

The series of exercise videos simulating actual newscasts were well thought out and realistic, and they added a high degree of realism to the scenario. However, the video film was not appropriately marked (by use of a streamer at the bottom of the actual video image or by other method) to clearly identify that the video was being used for exercise purposes only. If the videos were lost or somehow intercepted, there is nothing on the video to keep someone from thinking it was an actual event.

It was also noted that the exercise plan did not take into account an OST joint testing exercise (JTX) that was ongoing at the NTS at the same time as the emergency management exercise. Transmissions related to the JTX were being monitored by the TECC. The players involved in the emergency management exercise somehow transposed information on the convoy being used in the JTX. As a result, the OST EOC was misinformed as to the number of Safeguards Transporter (SGT) vehicles involved in the convoy. The JTX also impacted the emergency management exercise because normal convoy vehicle communication suites were not available, nor were normal cell phones available for communications between Federal agents and the TECC, since the cell phones were being used for the JTX. Also, the vehicles did not have the appropriate equipment (communications equipment, etc.) to facilitate exercise play and decision-making by the CCIC and other exercise participants. An additional concern is that planning did not consider the combined load on the TECC of the JTX, the "Desert Bighorn" exercise, and their normal duties of monitoring actual convoys and answering 911 calls.

Additionally, the exercise plan specified a convoy configuration that deviated from what actually would be used. This change in convoy configuration created problems throughout the exercise and made it difficult for participants to make informed decisions because they knew the actual convoy configuration that would be used for the simulated assets being transported. The exercise planners decided to use a non-standard convoy configuration because the more fully equipped vehicles were needed to support the JTX. Thus, emergency planners had to rely on vehicles that did not portray a convoy. The lower level of equipment support detracted from the realism of the exercise and created a high level of confusion at the onset for OST EOC participants.

With the exception of the convoy size noted above, the construction of the event scene was realistic and provided activities and conditions from which emergency responders would be able to make decisions appropriate for their area of responsibility. For example, two SGTs (tractors and trailers) were deployed, along with courier escort vehicles and adversary vehicles at the incident scene. Smoke was employed to represent a fire that resulted from the initial attack, the ensuing firefight, and subsequent damage to one of the SGTs. Mannequins were used to represent downed Federal agents and adversary forces. Visible messages were placed on each of them to indicate their current status to emergency responders. An actual courier was used to represent a courier injured during the attack. The courier had moulage placed on him to replicate the extent of his injuries, facilitating assessment by emergency responders. However, some exercise simulations could have been better prepared. For instance, a blanket was used to represent an unexploded ordnance-breaching package. This was not a realistic prop for the responding EOD group. It was also difficult at the event scene to identify what the true damage to the SGTs actually was since there were no exercise props to represent damage (e.g., bullet holes and overall damage, such as a breached trailer).

While the exercise plan identified important attributes related to controller/evaluator responsibilities and emphasized the importance of post-exercise critique, some weaknesses were noted in exercise evaluation. At the field evaluator locations, some controller/evaluators did not possess knowledge or experience commensurate with the areas they were controlling or evaluating. For example, the controller with the CCIC was not able to provide the necessary impromptu injects to ensure the smooth progression of the scenario/exercise. Evaluators did not always display familiarity with their respective responder's organizations, functions, procedures, and anticipated decisions/actions. Consequently, necessary controller injects were not always available, and evaluation consisted of simply recording event times. One post-exercise critique administered in Albuquerque was thorough and should result in lessons learned that will facilitate program improvement while one at the NTS was not. Venue "hot washes" could also be further improved. For example, the OST EOC conducted a good critique, but important exercise-related documentation that would allow for a more thorough evaluation was going to be destroyed until it was pointed out that the documentation would be needed for further analysis as part of this review. Field-level "hot washes" consisted of mostly general statements that all phases of the exercise went well for the specific location, with little, if any, input from the cadre present. Few substantive comments were forthcoming from controller/evaluators at the post exercise controller critique. The final OST exercise evaluation process, using the prepared evaluation sheets and feedback forms, was ongoing at the conclusion of the OA data collection period.

In summary, OST demonstrated improvement, since the 2001 OA evaluation, in its ability to effectively plan and conduct an exercise. Although some exceptions were noted, the development and execution of the exercise was well staged and included several major response organizations, allowing OST to evaluate emergency responder performance among the various organizations. The exercise was also well represented by Federal and local response agencies, and all exercise participants performed as if the exercise were an actual event. Objectives and associated evaluation criteria were included as part of the exercise plan and allowed OST evaluators to measure effective performance and identify areas for improvement. Although several shortcomings in the planning were noted by both OA and OST—OST JTX exercise interference and change in convoy configuration—they did not significantly detract from the overall exercise. However, the OST exercise evaluation processes were not always thorough and did not self-identify some obvious areas needing improvement, such as incident command and contamination control. Overall, the improvements shown by OST since the 2001 OA review provide confidence that they can effectively plan and safely conduct an exercise that will provide opportunities to identify weaknesses and improve emergency responder performance.

D.3 Conclusions

OST has significantly improved the training program since the last OA review, and several initiatives are in progress to further improve training for newly assigned roles and responsibilities associated with the OST EOC. Of particular note is the comprehensive initial and refresher training program for TECC staff. Additionally, the training program is supported by a well-established and implemented program of drills. However, although more comprehensive ICS training for the CCIC position has been developed, it has not yet been implemented and the exercise demonstrated weaknesses in this area. The exercise program has also improved since the last OA review, and contains the necessary program elements to enable an objective evaluation of the emergency response program. Although some improvements in exercise planning and evaluation can further enhance its effectiveness, the 2003 exercise demonstrated that it is an effective means to test the OST emergency response capability.

D.4 Rating

A rating of EFFECTIVE PERFORMANCE is assigned to the area of OST training and drills.

A rating of EFFECTIVE PERFORMANCE is assigned to the area of emergency response exercises.

D.5 Opportunities for Improvement

This Independent Oversight inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are intended to be reviewed and evaluated by the responsible line

management and accepted, rejected, or modified as appropriate, in accordance with site-specific programmatic objectives and priorities.

Training and Drills

- Consider consolidating all training administration within TLD and documenting all aspects of the OST training programs in the comprehensive training plan.
  - Merge all training records from contractors within the OST training tracking system.
  - Review the lesson plans used for all emergency response organization position web-based and classroom training (such as the ICS and protective actions) to ensure that learning objectives and associated training materials are directly relevant to agents' response activities, such as unified command, safety officer, integration of resources, and Senior Energy Official. Include, in these lesson plans, learning objectives to demonstrate performance of emergency response organization tasks.
  - Develop training matrices for all emergency response organization positions. Ensure that these matrices include practical training (such as OJT) as well as classroom and web-based training, drills, and exercises.
- Integrate emergency training into convoy commander training.
- Consider supplemental ICS training, such as the training provided by the California Forest Service.
- Implement position/task-specific training requirements for emergency response organization EOC training.
  - Consider using updated position-specific checklists for all emergency response organization personnel as a basis for job task analysis and to identify required training for these personnel.
  - Formalize EOC OJT training modules.
- Consider preparing an annual training plan for the entire OST training program. Examples of information that could be included in an annual training plan are: drill/exercise objectives and associated criteria; training matrices for emergency response organization personnel; training, drill and exercise schedules; and goals, objectives, and progress toward achieving these objectives. The existence of an annual training plan would also allow OST to more effectively control emergency response organization training and qualification.
- Establish a mechanism to ensure that remedial training, such as that identified by corrective actions to address identified performance weaknesses, is not a one-time fix, but rather that associated initial and continuing training materials, as necessary, are developed and used.
- For all OST drill components, include objectives and evaluation criteria to measure individual performance to ensure that drill participants benefit from the training opportunity through performance feedback.

Exercise Planning, Conduct, and Evaluation

- Consider a process and mechanism that would implement a "shadow force" for the TECC.
  - The shadow force would staff position(s) in the TECC that would allow them to manage real-time shipments and associated matters while the TECC emergency operations specialists participate in emergency response exercises.
  - Develop an exercise protocol that clearly stipulates TECC shadow force and emergency operations specialists' duties during an exercise. Ensure that the protocol clearly articulates roles and responsibilities, with clear focus on delineation of responsibilities and shadow force non-involvement in exercises.
- Consider implementing enhancements to exercise planning activities.
  - Ensure that OST emergency management exercise event scenes (involving convoy shipments) are treated with the same degree of realism and authenticity as a security JTX.
  - In planning emergency management exercises, avoid possible confusion and overloading of the

TECC by ensuring that they do not overlap with a security JTX.

– Provide convoy vehicles that have the same communications equipment and associated technical configurations that are used in security exercises so as to provide for full participation by the convoy commander, Federal agents, TECC, and other emergency responders.

– Develop credible props (such as simulated explosive devices) and, where feasible, appropriate observable damage to trailers (explosive –damage and breaches), so that an objective assessment and appropriate actions can be taken by the emergency responders such as CCICs, Federal agents, responding law enforcement agencies, fire and rescue agencies, and military EOD units.

- Establish a robust exercise evaluation process that ensures comprehensive "hot washes" and other post-exercise evaluations.

  – Prior to exercise evaluation, ensure that each controller and evaluator is familiar with the position(s) they will be evaluating and has reviewed pertinent emergency response documentation (plans and procedures) so that they understand the expectations and decisions of the responders and can effectively evaluate responders' proficiency.

  – At the end of the exercise, ensure that controllers and evaluators for each venue formally solicit input from players and from other controllers and evaluators (verbal and written) with emphasis on an open, non-retributive assessment of what went wrong, as well as noted strengths and areas for improvement.

  – Ensure that all pertinent exercise documentation (classified and unclassified) is preserved for analysis and evaluation at the end of the exercise. This would include such items as convoy shipment reports, participants' written notes, individual position checklists, event logs, plume models, and other exercise-related documentation. These documents would be collected from exercise participants located at the event scene, TECC, the OST EOC, and other participating organizations, such as DOE Headquarters and other agencies.

APPENDIX E
EMERGENCY RESPONSE

E.1 Introduction

The ultimate objective of emergency planning and preparedness is to prepare emergency responders so that they can apply their skills, procedures, and training to make appropriate decisions and to properly execute actions to protect emergency responders, workers, and the public. Critical elements of the initial response include securing the tactical situation, ensuring transporter safety, formulating protective actions, categorizing and classifying the emergency, and notifying onsite personnel and offsite authorities. Concurrent response actions include reentry and rescue, provision of medical care, and ongoing assessment of event consequences using additional data and/or field monitoring results.

Most of the information in this section is based on observations of the exercise conducted by the Office of Secure Transportation (OST) and observed by the Office of Independent Oversight and Performance Assurance (OA) personnel located in the OST Transportation and Emergency Control Center (TECC); the OST emergency operations center (EOC) and Nevada Site Office (NSO) EOC; and the key locations at the host Nevada Test Site (NTS), such as the emergency management center and the event scene where the emergency event originated. The scope of this review did not include an assessment of the NTS emergency program, but NTS activities are discussed where they interfaced with OST. In addition to exercise observations, post-exercise follow-up interviews and walkdowns were conducted with OST initial emergency response decision-makers, including TECC, OST EOC, and convoy commander in charge (CCIC) personnel at Albuquerque.

The exercise scenario simulated the aftermath of an adversary attack on a nuclear weapons convoy on the NTS; post-attack response activities by OST, NTS and other Federal agencies comprised the exercise play. For the exercise, real weather conditions were used. The winds were light and variable on a clear morning. Smoke plumes from pre-set fires at the scene of staged vehicles aided the CCIC in his decision-making. Exercise play was initiated with the convoy commander responding to the scene, which included dead and injured personnel, convoy vehicle fires, damage to vehicles by small arms fire, unexploded ordinance, and potential radiological contamination.

E.2 Status and Results

In the event of an emergency on a Federal site, the CCIC, as the U.S. Department of Energy (DOE) Senior Energy Official, participates in a unified incident command system (ICS) that exercises command and control of the emergency response until relieved by the Headquarters-designated Senior Energy Official. The CCIC receives support from the TECC in performing his responsibilities. Initial responder assets such as fire and security, activated by the site's protective force accompanying the convoy and led by their respective incident commanders, coordinate with the CCIC to orchestrate the response, including, for example, implementation of site-specific protective actions recommended by the CCIC. As venues at the host site become operational, certain elements of initial decision-making performed by ICS members are transferred to the appropriate venue in accordance with site emergency response procedures. Additional offsite assets, such as the Nellis explosive ordnance disposal (EOD) team, the Federal Bureau of Investigation (FBI), and the DOE Accident Response Group (ARG) respond as necessary, depending on event severity and other circumstances, with further transfer of command and control dictated by procedure.

The TECC in Albuquerque, New Mexico, as the 24-hour-a-day link to all OST transport teams and the emergency response duty officer (ERDO), categorizes the event, makes initial notifications, and verifies that appropriate protective action recommendations (PARs) are provided to local responders. The PARs are provided through a PAR card system where a PAR card is selected, using logic diagrams, based on event conditions. PAR cards are color-coded red for severe hazards and yellow for less severe hazards that have associated PARs. The TECC also initiates initial consequence assessment plume plots and, after consulting with the ERDO, recalls appropriate OST EOC staff. Once the OST EOC is activated, it assumes these TECC responsibilities through the leadership of the OST Emergency Manager.

During the 2001 exercise, OA identified weaknesses in implementing the emergency notification

process, providing timely consequence assessments, protecting responders, obtaining objective evidence on the status of the shipment, and implementing effective contamination control measures. This inspection noted improvements in implementing the notification process and timeliness in providing ongoing consequence assessments, but protection of responders and implementation of effective contamination control measures continue to be weak areas, as discussed below.

E.2.1 Command and Control, Emergency Response Organization, and Response Interfaces

Event Scene

The OST emergency response organization responded appropriately to the initial events postulated in the emergency management exercise "Desert Bighorn." Upon receiving the controller inject that the scene was stabilized with no evidence of adversarial forces active, and that a courier van and tractor were on fire with the first trailer breached, the CCIC briefed the balance of the Federal agents concerning the event status and then provided the NTS convoy protective force acting as escort with the same status report by radio. Via the NTS protective force, the CCIC requested that fire, medical, and additional protective force personnel respond to the scene. Following these initial reports and requests, the CCIC began implementing his checklists, quickly determined the conservative PAR, and ordered his Federal agents to don respiratory protection and immediately advise initial host-site responders that the PAR included evacuation to one-half mile and sheltering downwind to ten miles. These actions provided prompt and adequate short-term protective actions to the Federal agents and NTS protective force personnel and enabled NTS to implement prompt protective actions to site workers.

The initial CCIC decisions were based on the initial controller inject regarding the "trailer breached" status and the applicable PAR card annotated on the shipping manifest. The CCIC then attempted to report the event to the TECC, but was unable to communicate from his location of approximately 120 meters south of the event scene because it was a relatively low-lying area. The CCIC immediately ordered an alternate courier van (Mobile 4), co-located with the NTS protective forces incident commander at the outer perimeter (one-half mile south) of the incident site, to make the communication to the TECC on his behalf. Following this effort, the CCIC quickly dispatched his driver courier into the scene to determine the status of other agents and vehicles. Although the CCIC received a prompt report from his courier that a van and tractor were on fire and that one agent was alive but down with severe injuries, no additional urgent requests for medical support were relayed to the NTS protective force incident commander. Upon his return, the driver courier began implementing ICS checklists for the CCIC and communicated intermittently with TECC staff.

After confirming the stable security conditions with NTS protective forces, the CCIC appropriately turned to the longer-range issues of requesting such assets as helicopter support, RAP team support, the EOD team, and the DOE ARG team. Communications related to these requests, and status reports regarding the event scene and response activities to the OST TECC, continued to be only sporadically successful. Limited personnel resources prevented the CCIC from manning all ICS positions. Therefore, approximately one hour into the event, the CCIC ordered Mobile 3 Federal agents to approach within 300 meters south of the event scene and relocated his courier van to a position on a small knoll 100 meters east of his initial position. The CCIC relocation improved his communication capability, and the courier relocation provided personnel assets for staffing the CCIC's incident command organization. The CCIC immediately briefed his arriving agents, conferred with them on priorities, and ensured that they executed the steps of their respective checklists.

The EOD and the field monitoring team (Bechtel Nevada radiological control technicians were substituted for the RAP team) arrived in response to the CCIC's asset request. These assets were effectively integrated into the response organization. For example, on learning that unexploded ordnance was present near one of the convoy trailers, EOD advised the CCIC they would locate it, determine the best method for handling, and then check in with the CCIC before proceeding. These steps were accomplished by EOD, and EOD was subsequently given permission for disposition of the device in a manner that ensured the safety of responders and met the needs of subsequent criminal investigation activities.

Later, after the area was surveyed to confirm that no radiological release had occurred, the FBI and DOE ARG were effectively integrated into the response organization. Team arrivals were communicated from

the outer perimeter control point to the CCIC, who granted permission for their entrance into the "evacuated" half-mile area following the determination of no surface contamination. Upon arrival at the inner control point, the teams were directed to the CCIC incident command post (ICP); the CCIC's briefing included the scene situation and the potential hazards known at that time. All three organizational units were particularly effective in ensuring that they understood the situation and in formulating and executing a plan for their ensuing activities.

Adequate record keeping was not achieved at the incident scene. For example, although required by the CCIC's checklist, an effective log of significant actions taken and communications made was not retained, nor was the checklist used as a document to record accomplishment and time of completion. Consequently, the CCIC did not have a chronology of events with which to brief arriving assets, such as the EOD and DOE ARG, but had to rely mostly on his and others' memory to perform this task. The CCIC obtained a topographical map of the area from NTS responders, but the map scale did not support sketches of the scene to aid responders in visualizing the configuration of vehicles, external concerns, and location of casualties for rescue. Listing of required actions, including prioritization, was not completed; thus, it was often unclear to the CCIC and others whether a specific action request had been initiated and what the current status of response was. As an example, the CCIC immediately ordered DOE RAP deployed from the region to assist him at the scene. DOE RAP assets never did arrive, and the CCIC did not know their status throughout the exercise.

Some significant impacts on the overall scene response resulted from deficiencies in command and control decision-making. Notwithstanding the proximity of the CCIC's location to the event scene (120 meters) because of his initial convoy position, and communication difficulties due to the courier van location, the CCIC did not order relocation of his ICP to a safe position based on the potential hazards and his standard operating procedures (SOPs), i.e., one half-mile upwind/uphill from the scene. On several occasions during the initial response, the CCIC discussed with exercise participants that his location should have been at 2000 feet, a distance much greater than the position(s) he maintained throughout the exercise. Convoy commander SOPs require evacuation to 2500 feet for events postulated by this exercise, the distance at which the NTS protective force established their security cordon. A strong recommendation was indirectly provided to the CCIC by the NTS fire incident commander locating the NTS mobile command post at the proper distance, and the request (which was rejected) to have the CCIC's courier assistant locate in the mobile command post. The half-mile physical separation between the CCIC and the NTS response assets contributed significantly to an untimely response, missed communications, and lack of understanding of the events at the scene throughout the exercise. Physical co-location of the CCIC into the NTS mobile command vehicle would have enhanced the CCIC's ability to communicate with all response team leaders since it was at the outer perimeter entry control point (ECP), and had the capability for the CCIC to communicate directly with the technical resources, such as the TECC and NSO EOC, necessary to mitigate event consequences. As a result of the physical separation, the response was not fully integrated, adversely impacting the health and safety of workers and timeliness of mitigating event consequences as follows.

Command and control of casualty rescue efforts by the CCIC were not effectively implemented in a timely manner. As noted above, the CCIC was advised at 0831 (all times are Pacific Daylight Time) that one injured agent required rescue. After the security situation is stable, CCIC checklists direct aiding the injured as a priority. In addition, the CCIC advised exercise participants that courier protocols require the Federal agents to extricate near-scene casualties to a position suitable for transfer to medical response units, but this was not accomplished. NTS medical units were ready to receive casualties at the outer perimeter at approximately 0850 where a linkup could have been made, but was not. Although the responding units were fully ready (briefed on scene hazards) to make an entry at 0905, only a fire unit was admitted to the scene by OST Federal agents, as ordered by the CCIC. With relocation of Mobile 3 to a close-in position at about 0922, the CCIC ordered some of the Federal agents to begin recovering casualties but made no effort to prioritize their recovery efforts to rescue the injured. At 0939, Mobile 3 Federal agents departed the event scene without the injured courier and established an inner perimeter ECP "hot line" about 120 meters from the scene. The ambulance was admitted later, arriving at the ECP at 0955, and departed the scene with the injured at 1005. This represents a significant, unnecessary delay (the injured remained at the scene for an hour and thirty-five minutes) in rescuing the injured courier, with no urgency to make the rescue a priority.

Finding #5: OST responders did not establish an effective unified incident command system that provided command and control of the response to mitigate event consequences as required by DOE Order 151.1A.

Albuquerque

Once notified of the event, the TECC promptly categorized it and made the initial DOE Headquarters notification, verified that the appropriate PAR card was implemented at the scene, consulted with the ERDO and recalled the OST EOC staff, provided the OST EOC with initial data to obtain plume plots for consequence assessment purposes, and directed all other convoys to seek safe haven, using their checklists. Similarly, the ERDO utilized his logic diagrams and checklist to make OST EOC activation and recall decisions. It was evident that TECC personnel and the ERDO understand their roles and responsibilities, but most of the records that were transmitted and checklists that were used were incomplete.

The transition of assignments from the TECC to the OST EOC and their subsequent roles occurred seamlessly. The ERDO and OST duty officer provided continuity between the TECC and arriving OST EOC staff by providing an initial briefing of all event conditions known at the time. Functions of responding OST EOC staff members were appropriate for the exercise scenario, and the OST Emergency Manager provided effective initial command and control by providing periodic briefings of known information. However, the flow of complete and accurate information provided to the OST EOC later deteriorated as the NTS implemented its emergency response program. It then became unclear who (OST or NTS) was in charge of the event. Two information feeds to the OST EOC were lost when (1) a messenger runner between the TECC and OST EOC was reassigned to higher-priority tasks, unrelated to the exercise, and (2) when the NSO EOC shifted communications to a classified mode while the OST EOC remained in an unclassified mode. This occurred because NTS normally communicates in a classified mode during an operational emergency, but the OST Emergency Manager decided to remain in the unclassified mode due to the unclassified nature of the communications. Thus, important information regarding event classification and response activities, fundamental to effective command and control, was lost to the OST EOC and NSO EOC. For example, in addition to unknown event classification declarations, many conditions remained unclear to the OST EOC regarding the shipment status and configuration, protective actions taken, and casualty management.

NSO EOC took the lead in the distribution of information to the public and the media. While the scope of the OA review did not include a direct evaluation of NTS, it should be noted that although there was frequent interaction between the OST EOC public affairs representative and NTS public affairs, the initial statement acknowledging the incident was not released until almost two hours after the incident occurred. This delay resulted from weakness in the coordination of information between the NSO EOC and the OST EOC and their general lack of defined roles, responsibilities, and authorities governing coordination of an OST emergency with a National Nuclear Security Administration host site. As a result, the initial press release was not made at one hour after the time of event as required by the OST emergency plan.

E.2.2 Categorization, Communication, and Notifications

The TECC provided prompt and accurate event categorization and initial DOE notifications, consistent with NTS actions, and within the timeframes established by NNSA requirements and expectations. OST appropriately categorized the event as an operational emergency and issued the required FLASH notification and recommended protection actions to the DOE Watch Office. The plans, procedures, and training provided to the TECC were shown to be effective.

However, after these initial tasks were complete, the weaknesses in command and control and inconsistent communication protocols between the OST and NSO EOCs resulted in weaknesses in communications between the various venues. Since the OST EOC was not communicating with the NSO EOC, the OST Emergency Manager could not validate that appropriate protective actions were taken. The OST Emergency Manager attempted to contact the NSO EOC using alternative systems and phone numbers, but was unsuccessful. The following additional communication weaknesses contributed to confusion in the OST, NTS, and Headquarters EOCs throughout the exercise:

- The number of injured and deceased on scene reported by Federal agents to local responders in

face-to-face communications varied, resulting in miscommunications at all venues as the information was passed along.

- At the scene there was confusion about who the local responders were communicating with, because the CCIC did not don his incident commander vest and some Federal agents were not wearing identifying clothing. Additionally, the CCIC was unsure of the status of the DOE RAP team and made no follow-up requests. Finally, a courier's name was disclosed over the radio and on the NTS electronic status board.

- In Albuquerque, miscommunications between the TECC and the EOC resulted in delays in obtaining a National Atmospheric Release Advisory Capability (NARAC) plume plot.

- No timely initial news release was made from either the NSO EOC or the OST EOC.

E.2.3 Protective Actions and Reentry

The exercise demonstrated both effective and ineffective implementation of protective actions associated with the emergency response. The timely issuance of PARs by the CCIC to the NTS protective force resulted in the prompt classification and implementation of protective actions by the NTS emergency response organization—a half-mile evacuation zone and sheltering in place ten miles downwind. However, with respect to protection actions for response workers in the immediate vicinity of the event, actions were not effectively controlled and implemented.

Immediately following the initial condition briefing, the CCIC, knowing that he had a tractor on fire and a breached trailer, referred to his trip manifest, which identified "PAR: CHARLIE III" as the conservative PAR card, and confirmed that the card depicted PARs of an evacuation for a half-mile radius area and shelter-in-place for ten miles downwind. He then ordered all Federal agents to don respirators and directed Mobile 4, while they were relocating one-half mile south of the event scene, to relay the PAR card to the local responders. Upon arrival, Mobile 4 discussed and provided the PAR card to the NTS Security incident commander, and later did the same for the NTS fire department responders upon their arrival. This resulted in prompt and conservative protective actions for the Federal agents, the attendant NTS protective force, and site workers.

The decision to implement the red (i.e., severe hazard) PAR Charlie III, although conservative, was based on the trip manifest and not the conditions at the scene. Timely initial consequence assessment requires the CCIC to immediately review and consider all sources of information to ensure the correct protective action decision. Not until receiving a controller inject 50 minutes into the exercise, when he was given information about unexploded ordinance in the area of the vehicles, did the CCIC inquire (of the controller) whether fire or explosions had come from the trailer. If the CCIC considered that the fire only affected the tractor and used the logic diagram to determine the appropriate card, the yellow (i.e., less severe hazard) Charlie II PAR card, recommending shelter-in-place 800 meters, should have been selected. This is a significant difference in the recommended protective actions based upon an individual's interpretation of words on the logic diagram.

The effectiveness of protective actions implemented under the PAR card varied over the course of the exercise. Federal agents and the NTS protective force together established cordons at the half-mile perimeter, and NTS sheltered their workers in place expeditiously. The CCIC completed clear and comprehensive briefings to convoy members and NTS protective forces regarding the event status and hazard of concern (potential contamination), requested response assets, and ordered his Federal agents to don respirators within four minutes of exercise initiation. However, the CCIC did not effectively establish accountability of all Federal agents under his command by either scene inspection or roll call of Federal agents in mobile units so he could convey this information to assisting units. Consequently, throughout the exercise, requests for the casualty status of Federal agents were not resolved at any venue.

Although prompt actions to protect personnel were taken immediately, enforcement of personal protective equipment use, effective contamination control, and accountability of all personnel entering and exiting through inner and outer perimeters were not maintained. The CCIC did not implement accountability procedures at the outer or inner entry control points, personnel passed though these control points without wearing respirators, and conditions for the potential spread of contamination were overlooked. At the onset of the exercise, all Federal agents and on-scene vehicles could have been contaminated but were never surveyed.

These people co-mingled among themselves and with responders at the outer perimeter and inside the perimeter. Additionally, a courier van entered the near-scene area to collect and transport potentially contaminated fatalities from the scene. Because the field monitoring team had not yet arrived, these bodies and the van were not surveyed before exiting the inner ECP.

Notwithstanding the respiratory protection requirement, the EOD team, followed shortly by the field monitoring team, entered the half-mile evacuated area without respiratory protection. The EOD team leader reported to the CCIC ICP, but neither the team leader nor the CCIC considered it inconsistent that the CCIC was wearing a respirator while EOD team members were not. After being briefed by the CCIC, the EOD team donned anti-contamination clothing and respirators and entered the ECP with field monitoring team members, who entered without respirators to survey the area.

Finding #6: Protective actions in the form of contamination controls, establishing command in a safe location, ensuring that responders don respiratory protection, and establishing responder accountability were not implemented by OST personnel during an exercise, as required by DOE Order 151.1A.

E.2.4 Consequence Assessment

Albuquerque

The OST EOC Emergency Manager, using a plume plot created with the NARAC modeling program by an OST EOC plume modeler, performed adequate consequence assessment. The modeler used accurate source term information using the trip manifest line item number to obtain it from classified records. Other input data, such as meteorological and location data, was obtained through the TECC. Although communication errors in obtaining data delayed generation of the plume plot, the OST Emergency Manager used the plot to validate that appropriate protective actions were implemented. A second successful plume plot was also generated following a report of a wind shift at the scene. The application of the plume plots, however, was somewhat limiting because the OST Emergency Manager had no maps of NTS on which to overlay the plume footprint in order to identify the specific affected area. He could only conclude that the footprint was small enough that it would unlikely exceed protective action criteria off site and that protective actions within the half-mile and ten-mile zones were satisfactory. The OST Emergency Manager anticipated a Site Area Emergency declaration, but due to the previously noted communication problems, he was not informed of such classification until approximately 2 ½ hours into the exercise. More significantly, during a real event the NTS emergency management center, where NTS plume modeling is performed, cannot receive classified information, and therefore would not have access to the actual source term for performing their consequence assessment.

On Scene

The actual scene hazards were determined by the responding field monitoring team, consisting of two Bechtel Nevada radiological control technicians (RCTs), for radiological hazards and Nellis EOD personnel to deal with unexploded ordnance hazards. Once on scene, the RCTs, equipped with an alpha survey meter and a beta-gamma survey meter, performed adequate surveys of vehicles and personnel before exiting through the ECP and for surface contamination on the road, the deceased, and objects of interest. Surveys confirmed no release of radioactive materials. However, no air samplers were deployed with the field monitoring team to detect airborne particulate or gas activity. This oversight had no consequences in this case, only because there was no radiological release in the scenario.

In summary, initial event categorization and notification were prompt, and protective actions for site workers were conservative and effectively implemented. In some cases, good interfaces among diverse response organizations were demonstrated under challenging conditions. However, several weaknesses adversely affected an integrated response. The weaknesses were in the areas of on-scene command and control related to unified command structure, rescue operations, contamination control, and responder protection and accountability. Additionally, weaknesses in communications between all venues had a significant impact on the integrated response.

E.3 Conclusions

OST emergency response organizations were adequately staffed and activated to perform functions

necessary to respond to the postulated event. The OST response in event categorization, initial notifications, and actions to initiate protective actions for workers and the public were prompt and effective. OST adequately assessed the potential event consequence using an accurate source term and the NARAC dispersion model to validate protective actions. However, weaknesses in command and control and communications resulted in untimely rescue of an injured person, allowed personnel to enter evacuated areas without proper personal protective equipment, no accountability of responders, unclear status of response assets, and ineffective contamination controls at the scene. Hence, the exercise demonstrated timely and conservative protective action implementation for site workers and the public, but for not responders. Additional command and control weaknesses contributed to ineffective communication between the OST and NSO EOCs, and as a result, the response was not fully integrated.

E.4 Rating

A rating of NEEDS IMPROVEMENT is assigned to the area of command and control.

A rating of EFFECTIVE PERFORMANCE is assigned to the area of categorization, notification, and communication.

A rating of EFFECTIVE PERFORMANCE is assigned to the area of protective actions for workers and the public.

A rating of NEEDS IMPROVEMENT is assigned to the area of protective actions and reentry for responders.

A rating of EFFECTIVE PERFORMANCE is assigned to the area of consequence assessment.

E.5 Opportunities for Improvement

This Independent Oversight inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are intended to be reviewed and evaluated by the responsible line management and accepted, rejected, or modified as appropriate, in accordance with site-specific programmatic objectives and priorities. Many of the command and control weaknesses resulted from weaknesses in plans, procedures, and training, as discussed in Appendices C and D. Refer to those sections for additional related opportunities for improvement.

Enhance emergency response organization command and control practices to effectively mitigate the consequences of emergency events.

- Focus training on incident command protocols to ensure that event assessment, accountability, personnel contamination control measures, hazard mitigation, and integrated ICS procedures and checklists are effectively implemented.

- Ensure that implementing procedures, such as protective actions, are consistent with the information contained in associated source documents. For example, assure that use of the shipping manifest for conveying PARs includes reference to decision trees to select the correct action.

- Establish documented protocols for rescue of viable casualties to assure timely treatment.

- Establish documented protocols to provide guidance on establishing a safe location for a command post.

- Develop status boards for use by the CCIC to track incident events and status, aid in briefings to responding organizations, coordinate response activities, and share information with other organizations.

Improve responder safety, communications, and subsequent event investigation with comprehensive record keeping.

- Maintain logs of personnel, by name, who enter and leave through ECPs.

- Maintain activity logs at the event scene. Include items of interest expressed by the DOE ARG and FBI exercise players. Also keep track of asset requests.

- Provide complete information on DOE fax notifications.

- Provide more comprehensive documentation on checklists used in the TECC and OST EOC.

APPENDIX F
READINESS ASSURANCE

F.1 Introduction

The readiness assurance program provides the U.S. Department of Energy (DOE)-wide framework and multi-year planning mechanism for ensuring that program plans, procedures, and resources are adequate and sufficiently maintained to mount an effective response to an emergency. Readiness assurance activities include implementation of a coordinated schedule of program evaluations, appraisals, and assessments. Key elements of the readiness assurance program include self-assessments and timely implementation of corrective actions for identified weaknesses. For exercise evaluations, readiness assurance includes assessment of the effectiveness of the exercise as a means of demonstrating and continuously improving a site's integrated response capability.

This inspection included a review of Office of Secure Transportation (OST) emergency management self-assessments and the issues management program used to ensure that actions are taken to address identified program weaknesses. Also reviewed was the status of actions taken to address program weaknesses previously identified during the 2001 exercise by the Office of Independent Oversight and Performance Assurance (OA).

F.2 Status and Results

F.2.1 Self-Assessments

The 2001 OA review determined that OST assessment and corrective action management programs had not been sufficient to identify emergency management program weaknesses and correct previously identified deficiencies. Since that evaluation, OST has developed and initiated a comprehensive annual self-assessment program covering Federal agent facilities and emergency management. This program began in 2002 and by policy establishes procedural uniformity for the development of corrective action plans for weaknesses identified during self-assessments.

The OST self-assessment program includes adequate provisions for planning, reporting, corrective action development, and verification of corrective action completion. Requirements for these program elements are clearly established in plans and procedures. The OST Emergency Operations Assessment Plan specifies the emergency management policies for the self-assessment program. Assessments are conducted using 15 appraisal documents and associated performance objectives that contain multiple criteria against which each topic area is evaluated. The topic areas include such elements as hazards surveys and assessments, training and drills, exercises, readiness assurance, emergency response organization, offsite response interfaces, categorization, and notification. The OST self-assessment program manager sets the organizational and facility schedule and administers the program based on two standard operating procedures, one for self-assessments and the other for corrective action plan development. Immediately following the assessment, conclusions are provided to the appropriate facility/program manager.

The self-assessment program is designed to evaluate the elements of the emergency management program annually.However, the self-assessment plan also provides for subject matter experts, within the Emergency Management Branch (EMB), to determine which topic areas will be assessed and provides for elements not measured during one year to be documented and become a priority for the following year. Self-assessments are comprehensive and conducted in accordance with a detailed assessment plan. Meaningful findings and observations are identified, and root cause determinations are performed. Corrective actions are then developed and tracked on a local database maintained by the OST self-assessment program manager. The 2003 self-assessment program resulted in three findings at Federal agent facilities, and the corrective actions for these findings were completed and validated in a timely manner. OST has self-identified additional weaknesses outside of the formal assessment program and initiated corrective actions. For example, some of the procedure and training weakness discussed in Appendices C and D, respectively, have corrective actions in progress. However, in some cases progress has stalled, and necessary corrective actions remain to be implemented.

Overall, the OST emergency management self-assessment program is effective in identifying and correcting program weaknesses. This capability is

particularly important for OST since the emergency management program has been significantly revamped during 2003.

F.2.2 Corrective Action Management

The Standards and Evaluation Division is responsible for tracking corrective actions developed in response to OST internal and external surveillances, and assessments other than self-assessments. The program procedure requires that corrective actions be based on a documented root case analysis, risk assessment, and cost benefit analysis. Once corrective actions are entered into the appropriate tracking system – Safeguards and Security Information Management System (classified) or the Standards and Evaluation Division Deficiency Tracking System (unclassified) – corrective action plans are required to be reviewed and updated quarterly until closed and validated. The Safety, Security, and Emergency Management Division is responsible for maintaining and updating the Corrective Action Tracking System. This system tracks corrective actions developed in response to OA emergency management findings.

The policies for corrective action management are adequately established; however, one isolated instance was noted where the roles and responsibilities for implementing a policy were not effectively communicated. In August 2003, the EMB was reassigned the responsibility for occurrence reporting. This responsibility is delineated in Senior Leadership Council meeting minutes and an OST interim policy, dated August 16, 2003. However, the EMB acting manager was not aware that he had been assigned this responsibility, and hence, Occurrence Reporting and Processing System authority tables were not updated so that the responsible individuals could enter, update, and approve occurrence reports.

Corrective actions to address weaknesses identified by OA in 2001 were reviewed in order to evaluate program implementation. Corrective action plan closure packages indicate that corrective actions for all ten findings were implemented, validated, and closed. In general, corrective actions were effectively implemented, resulting in completed hazards surveys, a better quality hazards assessment, an improved emergency management plan, more thorough training, and a more effective exercise program. However, in two instances corrective actions were not fully effective. The first is the corrective actions related to contamination control measures that were completed and verified to be effective during the OST 2002 joint testing exercise. However, as discussed in Appendix E (see Finding # 6) of this report, the 2003 Desert Bighorn exercise evaluation determined that a weakness in contamination control measures has recurred. The second issue that was not effectively corrected concerns the criteria used by OST to determine recommended emergency classifications to the host sites, as discussed in Appendix C.

F.3 Conclusions

OST has developed a self-assessment program that is comprehensive and includes adequate provisions for planning, reporting, corrective action development, and verification of corrective action completion. Additionally, self-assessments have been effective in identifying and correcting weaknesses. Issues management systems are adequately established to capture, track, and ensure closure of all emergency management issues. In general, the corrective actions process is effectively implemented; however, in one instance a previous weakness recurred, and in a second the corrective actions were not fully effective. Overall, the OST assessment and corrective action programs have resulted in continuous improvement in emergency response capabilities.

F.4 Rating

A rating of EFFECTIVE PERFORMANCE is assigned to the area of National Nuclear Security Administration assessments and corrective action management.

F.5 Opportunities for Improvement

This Independent Oversight inspection identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are intended to be reviewed and evaluated by the responsible line management and accepted, rejected, or modified as appropriate, in accordance with site-specific programmatic objectives and priorities.

Self-Assessments

Consider the following actions to enhance the self-assessment program:

- Ensure that emergency management assessment criteria adequately address interfaces between OST and host sites—for example, by including specific roles and responsibilities for accomplishing response actions and verifying a common understanding of the processes and protocols to be used.

- Focus near-term assessment activities on the emergency management elements affected by the transition of responsibilities and facilities from the Albuquerque Operations Office to OST.

Corrective Action Management

Consider the following actions to enhance issues management processes:

- Establish a formal procedure for occurrence reporting, including roles and responsibilities for reporting and data entry, and for approval authorities. Ensure that authorities are updated in the Occurrence Reporting and Processing System database authority table.

- Consider consolidating issues management and corrective action tracking for self-assessments and the various drill and exercise programs used for emergency management improvement items to facilitate data retrieval to ensure that issues are adequately resolved.