Volume II

Inspection of Emergency Management at the

Pantex Plant

November 2002

Office of Independent Oversight and Performance Assurance
Office of the Secretary of Energy

INDEPENDENT OVERSIGHT INSPECTION OF EMERGENCY MANAGEMENT AT THE PANTEX PLANT

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Acronyms

AL	Albuquerque Operations Office
BWXT	BWXT Pantex, LLC
CFR	Code of Federal Regulations
CY	Calendar Year
DOE	U.S. Department of Energy
EAL	Emergency Action Level
EMD	Emergency Management Department
EOC	Emergency Operations Center
EPC	Emergency Press Center
EPI	Emergency Public Information
EPP	Emergency Plan Implementing Procedure
EPZ	Emergency Planning Zone
ERO	Emergency Response Organization
ERPG	Emergency Response Planning Guideline
ES&H	Environment, Safety, and Health
ETO	Emergency Telephone Operator
FY	Fiscal Year
HE	High Explosive(s)
JIC	Joint Information Center
MOU	Memorandum of Understanding
NA-40	NNSA Headquarters Office of Emergency Operations
NARAC	National Atmospheric Release Advisory Capability
NCR	Non-conformance Report
NNSA	National Nuclear Security Administration
OA	Office of Independent Oversight and Performance Assurance
OASO	Office of Amarillo Site Operations
OC	Operations Center
OSCDR	On-Scene Commander
OSCG	On-Scene Command Group
PEHA	Pantex Plant Emergency Hazards Assessment
PSS	Plant Shift Superintendent
SNM	Special Nuclear Material
S/RID	Standards/Requirements Identification Document
SS&EO	Safeguards, Security, and Emergency Operations Division
SST	Safe Secure Trailer
TEEL	Temporary Emergency Exposure Limit
TEOD	Transportation and Emergency Operations Division
TPQ	Threshold Planning Quantity

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INDEPENDENT OVERSIGHT INSPECTION OF EMERGENCY MANAGEMENT AT THE PANTEX PLANT

Volume II

1.0 INTRODUCTION

The Secretary of Energy's Office of Independent Oversight and Performance Assurance (OA) conducted an inspection of environment, safety, and health (ES&H) and emergency management programs at the National Nuclear Security Administration (NNSA) Pantex Plant in October and November 2002. The inspection was performed as a joint effort by the OA Office of Environment, Safety and Health Evaluations and the Office of Emergency Management Oversight. This volume discusses the results of the review of the Pantex emergency management program. The results of the review of the Pantex ES&H programs are discussed in Volume I of this report, and the combined results are discussed in a summary report.

The NNSA Office of the Deputy Administrator for Defense Programs is the lead program secretarial office for Pantex. As such, it has overall Headquarters responsibility for programmatic direction, funding of activities, and emergency management at the site. At the site level, line management responsibility for Pantex operations and safety falls under the Director of the Office of Amarillo Site Operations (OASO). Pantex is managed and operated by BWXT Pantex, LLC (BWXT), under contract to NNSA.

The primary mission of the Pantex Plant is the assembly, disassembly, testing, and evaluation of nuclear weapons in support of the Department's stockpile maintenance program. Pantex also performs research and development in conventional high explosives, and serves as an interim storage site for plutonium pits removed from dismantled weapons. The Pantex plant is located in the Texas Panhandle, approximately 17 miles northeast of Amarillo. The site encompasses approximately 9,000 acres of U.S. Department of Energy (DOE)-owned property, just over 2,000 acres of which are used to conduct the primary industrial operations, and 6,000 acres of property owned by Texas Tech University, which is managed for a variety of agricultural programs.

Pantex activities, which include industrial operations, facility maintenance, waste management, and environmental restoration, involve various potential hazards that need to be effectively controlled. These hazards include exposure to external radiation, radiological contamination, hazardous chemicals, and various physical hazards associated with facility operations (e.g., machine operations, high-voltage electrical equipment, pressurized systems, and noise). Significant quantities of radiological and chemical hazardous materials are present in various forms at Pantex.

Throughout the evaluation of emergency management programs, OA reviews the role of NNSA organizations in providing direction to contractors and conducting line management oversight of contractor activities. OA is placing more emphasis on the review of contractor self-assessments and NNSA line management oversight in ensuring effective emergency management programs. In reviewing NNSA line management oversight, OA focused on the effectiveness of OASO in managing the Pantex contractor, including such management functions as setting expectations, providing implementation guidance, allocating resources, monitoring and assessing contractor performance, and monitoring/evaluating contractor self-assessments. Similarly, OA focuses on the effectiveness of the

contractor self-assessment programs, which NNSA expects to provide comprehensive reviews of performance in all aspects of emergency management.

In addition to the OA review of OASO's emergency management oversight and operational awareness activities, this portion of the inspection evaluated progress since the August 2000 emergency management exercise evaluation in addressing key emergency response concerns. The inspection team also conducted tabletop performance tests with a sample of the site's key initial decision-makers to evaluate their ability to employ available tools and skills when responding to postulated emergency conditions.

The results of this review indicate that, overall, BWXT initial decision-makers are experienced and are adequately prepared to implement an effective response to the emergency events analyzed in the Pantex Plant emergency hazards assessment (PEHA). In addition, OASO and BWXT maintain effective interfaces with offsite agencies, and the significant level of sitewide drill activity provides the emergency response organization with many opportunities to maintain proficiency. However, the OA team identified a number of significant programmatic and implementation concerns in the areas of PEHA methodology, categorization and classification processes, and training and qualification program rigor that limit the level of emergency preparedness. In addition, OASO and BWXT have not implemented effective continuous improvement processes that can systematically identify and address weaknesses in the Pantex emergency management program. During this inspection, BWXT promptly implemented compensatory actions in response to the discovery of significant discrepancies between the facility-specific hazardous material inventory and PEHA analytical assumptions for a storage magazine. Nonetheless, immediate line management attention is necessary to address critical weaknesses in the processes by which hazardous materials are inventoried, tracked, and reported to the BWXT emergency management department for use in the PEHA.

Section 2 of this report provides an overall discussion of the results of the review of the Pantex emergency management program elements that were evaluated. Section 3 provides OA's conclusions regarding the overall effectiveness of OASO and BWXT management of the emergency management program. Section 4 presents the ratings assigned as a result of this review. Appendix A provides supplemental information, including team member 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.

2.0 RESULTS

2.1 Positive Program Attributes

OASO and BWXT have established an appropriate framework for an effective Pantex emergency management program, and many elements have been adequately implemented. Positive attributes of the emergency management program are discussed below.

Initial decision-makers demonstrated generally effective performance during tabletop performance tests. With few exceptions, BWXT plant shift superintendents (PSSs) effectively executed the key activities of event categorization/classification, preparation and transmittal of initial and follow-up notifications, and implementation of predetermined protective actions. Initial on-scene security and fire shift commanders effectively established on-scene command in accordance with established protocols and appropriately isolated the affected facility while protecting security and fire department responders. Both groups of responders used job aids and procedures effectively.

OASO and BWXT have established and are maintaining effective interfaces with offsite agencies, and have implemented an effective public education program. Through the protocols established by an agreement in principle between NNSA and the State of Texas, OASO and BWXT have expended significant effort to work cooperatively with offsite agencies to improve the level of emergency preparedness throughout the region and to address the emergency management concerns of offsite agencies. Furthermore, through such mechanisms as an annual calendar provided to residents within the emergency planning zone (EPZ) and a dedicated segment of the telephone directory, the public is informed of emergency response plans, notification and warning systems, and protective actions.

The Pantex drill and exercise program provides numerous opportunities for BWXT and OASO emergency responders to maintain emergency response proficiency. BWXT uses site-level drills, 14 of which were conducted in calendar year 2002, to integrate operational and emergency response at the division level. These, combined with the annual exercise, afford the necessary practice opportunities for a large emergency response organization (ERO) while providing frequent opportunities to identify response areas needing improvement. In addition, this level of activity provides confidence that the ERO can respond effectively to site events having a wide range of severity.

2.2 Program Weaknesses and Items Requiring Attention

The OA team identified several key weaknesses in the PEHA that are particularly significant because the PEHA is the foundation of the emergency management program. Concerns arising from inadequate definition or inconsistent implementation in several other important program elements were noted as well. Specific weaknesses are discussed below.

The PEHA does not adequately define or bound the range of events for which emergency plans must be developed. As a result of weaknesses in the site processes for identifying and tracking hazardous material inventories, the PEHA does not reflect actual quantities of materials that may be involved in a postulated event. In two instances, walkdowns of facilities chosen at random revealed the presence of significant quantities of hazardous materials that were either substantially understated in or missing from the PEHA analyses. The PEHA also does not accurately assess the consequences of the full spectrum of postulated events because (1) some low-probability, high-consequence events were either removed from consideration due to application of an arbitrary frequency cutoff or are absent altogether, and (2) weaknesses in analytical methodologies and assumptions limit the validity of results from event analyses. Furthermore, predetermined protective actions are not explicitly based on the associated event

consequences, so protective actions for site workers and protective action recommendations for offsite authorities and the public within the EPZ may not be appropriate. Additionally, the methodology for identifying and classifying events at levels below that of a General Emergency is faulty due to improper consideration of several key classification concepts. Finally, the rigor of the PEHA is diminished by lapses in the quality and completeness of documentation.

Emergency action levels (EALs) and emergency plan implementing procedures do not adequately support prompt and accurate decision-making. BWXT has not developed a complete set of EALs (which are critical for timely and accurate categorization/classification and protective action formulation) that can be easily implemented in a time-urgent, high-stress environment. The EAL set does not include some EALs for operational emergencies not requiring classification; some existing EALs reference indicators that are unclear or cannot actually be observed; and Emergency Management Department protocols consider the EALs as guidance documents, thus permitting reduced rigor in their usage. As a result, event classifications may not be consistent, and the appropriate set of protective actions may not be communicated to affected populations. The potential for inconsistencies was demonstrated during PSS tabletop performance tests, when the same scenario and identical event conditions produced an Alert classification (and "stay clear of area" protective action) by one PSS and a General Emergency (and an EPZ-wide shelter-in-place) by another PSS. Finally, BWXT has not developed a procedure to direct the overall categorization/classification process or to facilitate decision-making under unanticipated circumstances, such as multiple events or event initiators that affect multiple facilities. Most of these weaknesses were originally identified by OA during the August 2000 exercise evaluation.

The Pantex continuous improvement processes, as applied to the emergency management area, are not consistently effective in identifying weaknesses, developing and tracking corrective actions, and verifying effectiveness. BWXT self-assessments, sitewide drills, and exercises have identified few weaknesses or improvement items over the past several years, and those that were identified were seldom captured in a tracking system or had corrective actions formally developed and tracked to completion and verification. BWXT has permitted corrective actions to remain formally unresolved for extended periods of time, and in several cases, corrective actions for both internally- and OA-identified weaknesses have not been effective. Furthermore, although OASO and the Albuquerque Operations Office Transportation and Emergency Operations Division have conducted several specific oversight activities, the long-term absence of a dedicated emergency management program manager has significantly hindered OASO's ability to effectively monitor the status of the Pantex emergency management program and provide the necessary guidance and feedback.

The Pantex training and qualification process does not ensure that emergency responders are prepared to assume their duties when they are added to the ERO roster, and the ERO refresher program is not comprehensive or consistently implemented. In order to fill vacancies left by personnel reassignments and turnover, OASO and BWXT emergency responders are routinely added to the ERO roster before they complete assigned initial training and qualification activities and without having to demonstrate their ability to adequately perform the associated duties if they were recalled for an actual event. The OA inspection team noted that at the time of the inspection, approximately 25 percent of the 279 personnel listed on the ERO roster either had not completed all of the initial qualification requirements for their positions or had not satisfied their annual drill/exercise participation requirement. In addition, the content of the initial emergency response training courses is not geared to individual roles and responsibilities, and except for participation in an annual drill or exercise, formal annual refresher training has not been established for all ERO positions.

3.0 CONCLUSIONS

The Pantex emergency management program has notable strengths in many of the programmatic elements. From an emergency preparedness perspective, BWXT has devoted considerable resources to an active drill and exercise program that regularly exercises emergency responder roles and responsibilities. BWXT has been effective in preparing the PSSs, who are the site's key initial decision-makers, in their role as the interim emergency operations center incident commander; their effectiveness can be attributed to a combination of experience and the practice gained from drill participation. OASO and BWXT have been particularly effective in establishing and maintaining effective interfaces with offsite authorities, thereby benefitting the level of response preparedness throughout the region, and in implementing a public education program that significantly strengthens the ability of Pantex and local agencies to provide protective actions to the public in the unlikely event of an emergency at Pantex that has offsite consequences.

There are significant positive aspects to several other areas as well. The PEHA contains derived threshold planning quantities and protective action criteria for explosives (as a hazardous material), which are critical in defining the complete range of hazards to site workers. In the continuous improvement area, OASO has clearly established the responsibilities and requirements for NNSA line management oversight of the Pantex emergency management program. BWXT has established a framework for an effective self-assessment program and is in the process of implementing such additional improvements in assessment extent and rigor as the adoption of programmatic evaluation criteria contained in the DOE Order 151.1A emergency management guide. Furthermore, BWXT has implemented several meaningful improvements since the August 2000 OA exercise evaluation, including an electronic process for developing and transmitting the initial and follow-up event notification forms and an approach for initial on-scene decision-making that better integrates security and fire department functions while ensuring a clear chain of command.

The OA inspection team also identified several notable programmatic weaknesses, the most significant of which relates to the PEHA. The PEHA contains several fundamental deficiencies, including assumptions regarding hazardous material quantities (potentially available for release) that are inconsistent with actual facility inventories; a spectrum of potential initiating events that does not include several low-probability, high-consequence events; and errors in applying the event classification process. Additionally, predetermined protective actions have not been appropriately determined for site workers and the public. The collective impact is that the technical basis for initial response procedures and job aids does not ensure that initial decision-makers have all of the guidance and direction necessary to appropriately protect site workers and the public from potentially-significant events. In addition, without a suitable PEHA basis, hazard reduction activities might not be appropriately considered or prioritized.

The overall effectiveness of the Pantex emergency management program is also hindered by notable weaknesses in the areas of plans and procedures; training, drills, and exercises; and continuous improvement. The existing EAL set does not adequately support timely and accurate event categorization and classification, as demonstrated during tabletop performance tests. The observed weaknesses in EAL implementation result primarily from ambiguous indicators in some EALs; the fact that several events requiring categorization are absent from the EAL set; and the inappropriate designation of EALs as guidance documents, rather than procedures. Together, these weaknesses allow differences in individual judgment and knowledge to unduly influence the categorization/classification process, particularly in high-stress situations when decision-making can be problematic. The ERO training program does not require that ERO candidates complete their training and demonstrate position-specific competence before joining the ERO, a practice that is inconsistent with BWXT sitewide and Departmental expectations for a performance-based ERO training and qualification program. Finally, there are numerous weaknesses in the OASO and BWXT assessment and corrective action/issues management processes that hamper

consistent identification and satisfactory resolution of emergency management issues. These weaknesses range from a lack of rigor in the scope of the self-assessment program to a process that does not promote the identification, capture, and tracking of weaknesses and items for improvement identified during drills and exercises. In addition, the extended absence of a dedicated OASO emergency management program manager is a considerable impediment to OASO's ability to effectively monitor the Pantex program and identify areas needing improvement. OASO management is aggressively attempting to fill the position; however, continued difficulty in this area represents a substantial challenge to management's ability to provide sufficient NNSA line management oversight.

Immediate BWXT line management attention is necessary to ensure that hazardous material inventories are accurately identified and included in PEHA analyses and, where inconsistencies are identified, to implement appropriate compensatory measures so that initial decision-makers can adequately protect site workers and the public during an event at the affected facility. It should be noted that during this inspection, BWXT promptly implemented compensatory actions in response to OA concerns regarding significant discrepancies between the facility-specific hazardous material inventory and PEHA analytical assumptions for a storage magazine. Furthermore, in the short term, rigorous processes must be established and implemented to ensure that changes in hazardous material inventories, whether resulting from changes in process or material movement, do not produce unanalyzed event sequences or consequences. OASO and BWXT line management attention is also needed to implement rigorous assessment and corrective action mechanisms that will facilitate meaningful, long-term improvements in the Pantex emergency management program, as well as in the broader area of integrated safety management, which is discussed in Volume I of this report.

4.0 RATINGS

This inspection focused on a detailed assessment of nine 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 Pantex emergency management program element at the time of the inspection. The ratings assigned below to the readiness assurance category are specific to those assessment, corrective action, and performance monitoring mechanisms applicable to the emergency management area.

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

Emergency Planning

Hazards Survey and Hazards Assessment.....SIGNIFICANT WEAKNESS
Program Plans and Procedures.....NEEDS IMPROVEMENT
Offsite Interfaces.....EFFECTIVE PERFORMANCE

Emergency Preparedness

Training, Drill, and Exercise Program.....NEEDS IMPROVEMENT
Emergency Public Information.....EFFECTIVE PERFORMANCE

Emergency Response

BWXT Emergency Response Decision-Making.....EFFECTIVE PERFORMANCE
OASO Emergency Response.....EFFECTIVE PERFORMANCE

Readiness Assurance

NNSA Assessments and Performance Monitoring.....NEEDS IMPROVEMENT
Contractor Assessments and Issues Management.....NEEDS IMPROVEMENT

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APPENDIX A

Supplemental Information

A.1 Dates of Review

Scoping Visit	August 27 - 29, 2002
Onsite Inspection Visit	October 28 - November 7, 2002
Report Validation and Closeout	November 19 - 21, 2002

A.2 Review Team Composition

A.2.1 Management

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

A.2.2 Quality Review Board

Michael A. Kilpatrick	Dean C. Hickman
Patricia Worthington	Robert M. Nelson
Charles B. Lewis	Douglas P. Trout

A.2.3 Review Team

Thomas Staker, Deputy Director, Office of Environment, Safety and Health Evaluations (Team Leader)

Steven Simonson (Topic Lead)
J.R. Dillenback
Steve Kirchhoff
Tom Mazour
Jeff Robertson
Tom Rogers
David Schultz

A.2.4 Administrative Support

Lee Roginski

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APPENDIX B

Site-Specific Findings

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

FINDING STATEMENTS	REFER TO PAGES:
1. BWXT has not implemented mechanisms that appropriately identify, track, and assess all hazardous materials so that current inventories, changes in inventories, and changes in processes are adequately evaluated to support emergency planning and response, as required by DOE Order 151.1A, *Comprehensive Emergency Management System.*	15
2. BWXT has not accurately assessed an appropriate spectrum of emergency events and conditions or determined barrier failure indicators and predetermined protective actions based on event consequences, to provide the necessary technical basis for effective emergency response decision-making tools, as required by DOE Order 151.1A.	17
3. The BWXT emergency action levels, other implementing procedures, and current protocols for procedure use do not ensure that accurate emergency classifications and protective actions are communicated in a timely manner to site workers and offsite jurisdictions, as required by DOE Order 151.1A.	20
4. The Pantex emergency management training program does not ensure that ERO personnel have been trained and qualified in their assigned tasks, as required by the Pantex emergency plan and plant training standards.	29
5. The BWXT drill and exercise evaluation process does not ensure that program and performance weaknesses are identified and corrected, as required by the Pantex emergency plan, the plant standard on drills, and the exercise program implementing procedure.	30
6. OASO has not established a program for conducting assessments of the Pantex emergency management program, as required by DOE Order 151.1A, and has not been effective in identifying program weaknesses.	41
7. BWXT emergency management self-assessments are not sufficiently rigorous to consistently identify programmatic weaknesses, and program elements are not assessed annually, as required by DOE Order 151.1A.	42

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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 assure an effective emergency response. Key elements of emergency planning include developing a hazards survey and an emergency planning hazards assessment to identify and assess the impact of site and facility-specific hazards and threats, and establishing an emergency planning zone (EPZ). Based upon the results of these assessments, U.S. Department of Energy (DOE) and National Nuclear Security Administration (NNSA) 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 site's 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 who support the response effort and receive NNSA emergency notifications and response recommendations.

This evaluation included a review of corrective actions developed and implemented in response to emergency action level (EAL) and emergency plan implementing procedure (EPP) weaknesses identified in the August 2000 Office of Independent Oversight and Performance Assurance (OA) emergency response exercise evaluation at the Pantex Plant. Also reviewed were the Pantex Plant emergency hazards assessment (PEHA) and supporting documents. Because these documents were not previously evaluated, the OA inspection team conducted facility walkdowns to verify PEHA assumptions and reviewed the development process for potential indicators for EAL development, predetermined protective actions, and the EPZ. Additionally, the Pantex emergency plan and associated implementing procedures were reviewed, with a focus on the guidance provided to initial decision-makers in the areas of event classification and protective action formulation. Finally, the OA team evaluated the efforts of BWXT and the Office of Amarillo Site Operations (OASO) in coordinating the site's emergency management program with offsite agencies.

C.2 STATUS AND RESULTS

C.2.1 Hazards Survey and Hazards Assessment

The PEHA serves as the foundation of the emergency management program; consequently, its validity and rigor are key to building response procedures that meet the Department's expectations for the emergency management program to serve as the last line of defense in protecting site workers and the public. The Pantex PEHA was found to include several positive attributes; however, critical shortcomings substantially impact its adequacy and effectiveness as an emergency planning tool.

The first step in developing a hazards survey and hazards assessment is to define the process and establish the necessary roles and responsibilities to ensure accuracy, rigor, and maintainability. BWXT has established requirements in the emergency management standards/requirements identification document for performing a hazards survey and hazards assessment. However, these requirements have not been

incorporated into standards or procedures that define the PEHA process and control and authorize work performance. Consequently, the PEHA is a legacy product containing data compiled over many years, rather than resulting from a well organized development process leading to technically accurate output products. Many of the problems described below can be attributed in part to not defining and implementing a formal PEHA development and maintenance procedure that includes a multi-disciplinary review and buy-in by the appropriate process and facility experts. It should be noted that during this inspection, the Emergency Management Department (EMD) initiated preparation of a draft work plan to guide the development of a hazards survey and the PEHA.

The next step in the process is to develop the hazards survey, which serves as the basis for determining the level of response planning needed for a given facility as well as establishing the need for a hazards assessment. Although BWXT has not prepared a separate, stand-alone hazards survey for facilities or activities such as transportation, the PEHA includes many elements of a hazards survey, such as an overall description of facilities and activities on the site and the generic emergency conditions from external event initiators, such as natural phenomena, that may affect the facilities. As part of its PEHA efforts, BWXT has initiated such reductions in site hazards as minimizing hazardous materials in work areas and relocating aircraft flight paths from over the plant during inclement weather. However, some qualitative elements appropriate for a hazards survey are not documented in the PEHA, such as identifying offsite hazards that may affect the site (both fixed facility and near-site transportation hazards) and NNSA hazardous material shipments off site. To correct some of these weaknesses, EMD staff recently obtained calculations for offsite, fixed facility, and example transportation-related emergency events that may be used as a technical basis for further assessment in the December 2002 PEHA revision. Another missing element related to a hazards survey is a summary of the potential health, safety, and environmental impacts of events internal to facilities, and the applicable planning and preparedness requirements. Finally, the inclusion of hazards survey information within the PEHA makes it a voluminous document, thus detracting from its utility as a user-friendly, concise reference for emergency planning and response.

Development of a quantitative hazards assessment should start with defining site facilities, describing facility operations, and identifying and screening hazards. The PEHA adequately defines facility operations and determines criteria for screening identified radiological and chemical hazards. Particularly noteworthy is the Pantex development of threshold planning quantities (TPQs), that quantity above which DOE facilities must perform quantitative analyses, for high explosives (HE). Although HE is not included in published lists of hazardous material TPQs, the site has recognized that HE exhibits hazardous toxicological properties (as well as the hazard of blast damage) and has derived TPQs for these materials based on conservative release assumptions. Similarly, HE protective action criteria in the form of a one-hour emergency exposure limit (i.e., emergency response planning guidelines – ERPG-2) were not available in published literature; consequently, the site derived plant-specific protective action criteria based on industry literature and standards. However, certain assumptions in the process are inconsistent with DOE expectations. For example:

- The eight-hour workplace exposure limits are not appropriately adjusted (factor of five) in developing ERPG-2 values for explosives of interest to account for the difference in exposure durations.

- The HE TPQ is not based on the amount of HE that, if dispersed, would exceed DOE protective action criteria at 30 meters, which is the criterion for the least severe emergency classification of Alert. Instead, the HE TPQ is based on the amount dispersed to the environment that would result in exceeding the unadjusted exposure limit at the ten-mile EPZ boundary.

Notwithstanding these potentially significant calculational errors, the degree of conservatism embedded in the analysis provides reasonable assurance that the derived TPQs for HE are adequate.

A comprehensive screening process is contingent on an accurate site inventory of hazardous materials. BWXT has implemented effective inventory mechanisms for special nuclear material (SNM) and explosives for nuclear weapon programs. For other materials, several sitewide mechanisms have been established to notify EMD of facility changes that may affect PEHA accuracy. For example, Plant Standard 3013, Centralized Review System, directs cognizant divisions (including EMD) to review such documents as drawings, work plans, and construction design documents for potential impact, and requires signoff before plant changes are implemented. However, a sitewide inventory mechanism for all hazardous materials other than nuclear weapon program material is not available, and PEHA analysts must check several disparate department-level inventory lists. Also, BWXT has not developed a sitewide mechanism for notifying EMD of significant changes in non-weapons-related hazardous material inventories.

To check the effectiveness of the existing facility change and inventory mechanisms for non-weapons materials and to confirm that the PEHA accurately reflects hazardous material inventories, the OA team conducted walkdowns in six facilities. Four of the facilities were found to contain inventories consistent with the PEHA; two facilities (shipping/receiving warehouse and a storage magazine) did not. The shipping and receiving warehouse contained approximately 10,000 pounds of concentrated sulfuric acid that was moved into the warehouse subsequent to a plant process change and that was not assessed in the PEHA. Sitewide hazardous material inventory systems available to EMD indicate that no hazardous materials are present in the warehouse in significant quantities, even though the sulfuric acid has been stored in the building for more than a year.

In the case of the storage magazine, the PEHA survey inventory reflects a total content of approximately 10,000 pounds of HE. However, the PEHA analysis uses a much smaller HE quantity that produces no classifiable emergency. The facility walkdown determined that the actual inventory is considerably more than the expected 10,000 pounds of HE, which is within facility administrative limits. Additionally, a large amount of depleted uranium, a potential toxicological hazard, is also present in the magazine. This material is reflected in a sitewide inventory database but is not assessed in the PEHA. Furthermore, the HE has been in storage for many years, resulting in potentially adverse effects on material stability. The difference between assessed and actual inventories is significant in that an appropriate, facility-specific EAL, together with pre-determined protective actions, was not available to the plant shift superintendent (PSS) for emergency decision-making. The OA team determined that the consequences of a magazine event using actual material inventory could result in a situation requiring classification as a Site Area Emergency or General Emergency. Following discovery of these PEHA deficiencies, BWXT promptly implemented compensatory actions in the form of an interim EAL to provide the necessary guidance to initial decision-makers.

Finding #1: BWXT has not implemented mechanisms that appropriately identify, track, and assess all hazardous materials so that current inventories, changes in inventories, and changes in processes are adequately evaluated to support emergency planning and response, as required by DOE Order 151.1A, *Comprehensive Emergency Management System.*

The next step in the assessment process is to characterize the hazards remaining after the screening process is completed. The PEHA effectively characterizes the hazards for onsite materials, including both the radiological and toxicological characteristics of various substances. For example, the toxicological properties of uranium were appropriately assessed for initiating events involving weapons components. The PEHA describes the conditions of storage and use; includes material properties needed to determine the source terms; and generally documents the engineered and administrative controls that mitigate hazardous material releases. However, conditions of storage are not always conservatively selected to

ensure that the full spectrum of emergency events are considered. For example, the Safe Secure Trailer (SST) is selected as the transportation medium for assessing the onsite movements of explosives, but the PEHA does not provide any analyses to demonstrate that other carriers currently used on site are as robust as the SST. Because other carriers are often used for moving explosives on site, the PEHA analyses do not ensure that the consequences of an event involving any explosives carrier would be bounded by the SST results.

The last step of the PEHA development process is analyzing the emergency events and conditions that can affect facilities and activities, estimating consequences to affected populations, and determining indicators of barrier failures for use in developing EALs. In some cases, the Pantex PEHA postulates and analyzes events that cover the full range of possible initiators and severity. For example, malevolent acts and beyond-design-basis events, such as lightning strikes, are considered as potential initiators for the release of chlorine from its onsite storage locations. However, significant weaknesses were noted in the spectrum of other potential initiating events considered in the PEHA. For example:

- Certain high-consequence, low-probability events are not appropriately considered as potential initiating events. For example, based on 1993 data, large aircraft crashes are considered to be beyond-design-basis events based on a probability of approximately 2×10^{-7}, and are therefore not further assessed, even though large aircraft routinely operate in very close proximity to the site. Use of an arbitrary frequency cutoff to discount such events in the PEHA is inconsistent with DOE expectations, and is particularly inappropriate for Pantex in the case of large aircraft events because their consequences are considerably more significant than for the small aircraft events evaluated in the PEHA.

- The PEHA describes the worst-case explosion in a weapon assembly cell as one in which a large amount of HE detonates and collapses the roof of the cell (i.e., the "gravel gertie"), effectively filtering the dispersed SNM and minimizing the release of hazardous material. As discussed in Volume I of this report, a much smaller amount of HE is actually the worst-case event because the cell roof does not collapse, significantly reducing the filtration effect and increasing the source term by more than an order of magnitude, with similar increases in consequences at the receptors of interest. In fact, thresholds for early lethality are exceeded for the more severe event at significant distances from the event scene. The impact of mischaracterizing the worst case is that the current predetermined protective action planning approach, which calls for sheltering co-located workers in place, may be incorrect because such factors as hazardous material infiltration to adjoining cells where workers are sheltered have not been evaluated. It should be noted that during this inspection, EMD established a consequence assessment model users' group to ensure that analysis results are shared among such assessor groups as nuclear explosives safety, security planning, and EMD.

Weaknesses were also identified in the process for estimating release consequences, determining classification thresholds, and formulating predetermined protective actions. For example:

- The PEHA does not include any justification for the assertion that the values chosen for wind speed and stability class correspond to 95 percent of the worst-case conditions, consistent with Departmental expectations. A review of several years of meteorological data by the OA team indicates that much lower values of wind speed and more stable atmospheric conditions more closely approximate worst-case conditions. Thus, the release calculations for many of the PEHA scenarios may not always be conservative.

- A facility boundary distance of 100 meters was generically applied as a "critical receptor," rather than determining the facility boundary in accordance with applicable guidance. Furthermore, the PEHA

does not correctly define an Alert as that area within which protective action criteria are exceeded beyond 30 meters from the release point, but not beyond the facility boundary. Rather, the PEHA used as the Alert definition the condition that the protective action criteria is exceeded at 100 meters from a hypothetical release point. Consequently, the logical progression in event severity based on the specific facility and events within its boundaries is not achieved, and many postulated events may be improperly classified. Furthermore, because the PEHA did not determine consequences within 100 meters of facilities, EAL event indicators have not been determined for emergency classifications in circumstances where consequences exceed protective action criteria at distances less than 100 meters.

- The default protective action associated with all onsite EALs is to evacuate the affected area upwind and to shelter in place for the balance of the plant. No distances have been predetermined for any event that assist initial decision-makers in assessing what the affected area is from which workers should be evacuated. Similarly, for all General Emergencies, the recommended protective action is to shelter the entire EPZ in place, irrespective of what protective action may ultimately be necessary based on event consequences. Not basing the type and extent of predetermined protective actions on the consequences calculated in the PEHA could result in recommending protective actions that are inadequate to prevent long-term health effects to affected plant workers and the public.

Additionally, weaknesses were noted in the PEHA process for identifying failures of barriers that prevent hazardous material releases, which is key to facilitating early event identification and severity determination for purposes of accurate event classification and protective action formulation. For example, the PEHA analysis of a significant chlorine release determined that consequences ranging from an Alert to a General Emergency were possible. However, the PEHA did not identify such indications of a less severe barrier failure as a visible vapor cloud escaping the facility or a chlorine alarm. Consequently, Alert severity EAL thresholds for a small release are not included in decision-making tools. Similar deficiencies in considering and utilizing other barrier failure indicators were noted for events involving weapons systems, such as not using radiation area monitoring systems to differentiate the extent of involvement of various hazardous materials.

Finding #2: BWXT has not accurately assessed an appropriate spectrum of emergency events and conditions or determined barrier failure indicators and predetermined protective actions based on event consequences, to provide the necessary technical basis for effective emergency response decision-making tools, as required by DOE Order 151.1A.

Finally, the OA team noted that the ten-mile Pantex EPZ is adequately documented in the PEHA, that it is conservative for the spectrum of events currently assessed, and that its technical basis has been reviewed by OASO. BWXT considered appropriate protective action criteria in verifying the adequacy of the EPZ size, and the sizing and shape are consistent with demographic and geopolitical factors and are agreed to by state and local authorities. Because the EPZ size is already at the maximum prescribed by Departmental expectations, any revisions to the PEHA resulting from actions necessary to address the PEHA weaknesses discussed above will not affect the EPZ.

In conclusion, BWXT has been proactive in reducing plant hazards to minimize potential events involving hazardous material releases, and the site has prepared a comprehensive set of criteria that may be used to screen HE materials and quantitatively assess the consequences of an HE release. However, BWXT has not developed a formal, comprehensive process to construct and maintain the hazards survey and PEHA. Consequently, several key elements required for establishing a technically sound basis for the emergency management program are inadequate. Critical shortcomings include an incomplete consideration of facility-specific hazards actually present because plant mechanisms fail to track

hazardous material inventories and changes in processes; incomplete identification of emergency events; an erroneous event classification scheme for Alert-level events; and inaccurate event analyses. Collectively, these deficiencies negatively impact the adequacy of the various event classifications and the associated predetermined protective actions that are necessary for effective emergency response planning. Therefore, the PEHA does not provide reasonable assurance that (1) a technically accurate basis is available to support the plans, procedures, and resources needed to respond to all postulated Pantex emergency events; and (2) that site workers and the public will be adequately protected during and after significant events.

C.2.2 Program Plans and Procedures

The August 2000 OA emergency response exercise evaluation determined that the overall response effort was adversely impacted in part by plans, procedures, and job aids that were unclear or poorly structured and hence did not always support prompt and accurate decision-making, particularly in the area of emergency categorization and classification. Since that evaluation, BWXT has reviewed and updated EALs and response checklists; modified the emergency plan to include revised operational emergency definitions and EAL usage guidance; and developed and implemented an on-scene command policy. These efforts have improved performance in the command and control area, as described in Appendix E, but weaknesses remain in procedures that are used to direct key initial decision-making activities, as described below.

The Pantex emergency management plan contains the essential elements of a comprehensive emergency management program, and with one exception, a comprehensive series of procedures has been developed for implementing the emergency plan. BWXT expectations for developing, implementing, and maintaining facility-specific emergency plans and procedures are formally established in an EPP. With few exceptions, these requirements are implemented effectively, and the facility-specific plans and procedures contain appropriate and pertinent information needed to implement the site emergency management plan at the facility level. Furthermore, the emergency plans and associated implementing procedures are formally approved or concurred in by the appropriate BWXT and OASO managers, and their annual reviews and updates are well managed to meet review and update schedules. However, in several instances the document control process was not effective in keeping up-to-date procedures available to users, as described in Section F.2.2 of this report.

Although the emergency plan is generally comprehensive in breadth, its description of several aspects of the Pantex emergency response approach is not sufficiently detailed to show how these functions contribute to a comprehensive emergency response to operational emergencies. This level of detail is especially important to offsite organizations, who for security reasons do not currently have a set of the Pantex EPPs and therefore use the emergency plan as an educational tool. For example:

- The plan does not differentiate between event categorization and classification and does not discuss notification requirements for operational emergencies not requiring classification.

- The plan does not describe the purpose and limitations of communication systems used for recalling the emergency response organization (ERO), making offsite notifications, and communicating protective actions to site workers and protective action recommendations to the public.

- The definitions of Alert and Site Area Emergency classifications differ from those in DOE Order 151.1A and other EPPs.

The OA inspection team also noted several deficiencies in the tools used by initial decision-makers to categorize and classify emergency events that contributed to PSS performance weaknesses during

tabletop performance tests. The first is that BWXT has not developed a procedure to direct the categorization and classification process, which was a weakness identified during the August 2000 OA exercise evaluation. Clear, written direction is still not provided in the areas of:

- Expectations for prompt classification
- Rules for applying primary and confirmatory EAL threshold indicators
- Instructions on when to downgrade and upgrade categorizations and classifications, how to address multiple events or initiators that affect multiple facilities, and how and when to employ discretionary EALs.

Furthermore, the emergency plan states that EALs are to be used as guidance documents, which is inconsistent with the site's procedure adherence standards. This inconsistency, combined with EAL indicator weaknesses, resulted in PSSs making several inappropriate classification decisions during the tabletop performance tests. For example, in one case the PSS did not upgrade a classification and implement the prescribed protective actions, even though both primary and confirmatory EAL indicators were present. As a result, an inappropriate "stay clear of area" protective action was implemented when the EAL called for sheltering in place. In another case, the PSS did not make a decision on the basis of a primary and a confirmatory indicator because he suspected an instrument malfunction, and he took no action to obtain a second confirmatory indicator.

The existing EAL set also does not include the complete set of operational emergencies not requiring classification that are defined in DOE Order 151.1A. In addition, the set contains numerous EALs that use threshold indicators that are ambiguous, cannot be directly observed, or are not germane to the event. For example:

- An EAL uses "exceeding any protective actions criteria at 100 meters" as an indicator without providing the type of hazard, the threshold concentration or dose, or a means to measure it.
- An EAL uses "direct observation of tritium release" as a threshold indicator to be used by the PSS, but no such mechanism exists.
- Some EAL threshold indicators that are listed do not provide quantifiable evidence of event significance to help in formulating appropriate protective actions (e.g., "Towercam" is used without further consideration of a puff or continuous release).
- One EAL uses the presence of SNM in a bay to confirm a tritium release, but the presence of SNM is not germane to the event.
- Some EALs use the presence of SNM as a threshold indicator. The PSSs and many Pantex personnel do not limit the definition of SNM to isotopes defined by 10 CFR 70, and instead apply the generic term "radioactive material." This ambiguity contributed to a delay in initial decision-making during the October 2002 trailer fire event because the PSS was attempting to determine the applicability of such EALs when he thought that radioactive sources might have been present in the trailer. Using the presence of SNM as an EAL threshold indicator may be correct in some analyzed events, and using the presence of radioactive materials may be appropriate in other cases—further complicating the decision-making process.

OA identified several of these weaknesses during the August 2000 exercise evaluation, but the site's efforts to redefine operational emergencies and review and update EALs have not been effective in developing a categorization and classification process that can be easily implemented in a high-stress, time-urgent environment.

Pantex response procedures and checklists also have weaknesses in the areas of performing accountability of personnel and notifications to offsite authorities. The Pantex accountability system effectively accounts for most onsite personnel when it is desirable to perform sitewide accountability. However, several weaknesses hamper the effectiveness of the accountability process for a facility-specific event. The most important impediment is that current procedures do not direct the performance of accountability until after the emergency operations center is activated; the resulting delay can be significant when the ERO must be recalled from offsite. As a result, accountability of personnel might not begin in a timely manner, and the current process requires accountability of all onsite personnel, not just those in the affected zone or facility. Additionally, no accountability protocols have been developed to determine the status of visitors and individuals without permanent badges during hours when the badging office is not staffed. Collectively, these weaknesses may delay decisions to initiate life safety activities or impact their rigor. Because delayed response in establishing personnel accountability was identified as a weakness during the August 2000 exercise, the site initiated a feasibility study for establishing zone- or facility-specific accountability procedures. However, this study ended without providing any solutions and the corrective action was closed based on a point paper, which is not on file. A BWXT process improvement team is currently evaluating methods for improving the timeliness of personnel accountability.

Finally, effective implementation of the offsite notification process, which is discussed in more detail in the following section, has been hampered by a series of operational and hardware problems over the past several years. Several weaknesses in the notification procedure and related checklists also limit this important process.

Finding #3: The BWXT emergency action levels, other implementing procedures, and current protocols for procedure use do not ensure that accurate emergency classifications and protective actions are communicated in a timely manner to site workers and offsite jurisdictions, as required by DOE Order 151.1A.

To summarize, BWXT has established a generally comprehensive set of sitewide and facility-level emergency plans and procedures and has implemented several effective corrective actions in response to procedure-related weaknesses previously noted by OA, such as updating response checklists and developing and implemented an on-scene command policy. However, some of these corrective actions have not been effective in addressing initial decision-making concerns, particularly in the area of EALs. EALs do not contain a consistently usable set of threshold indicators to promote effective decision-making in a time-urgent, high-stress environment. When combined with the absence of a categorization/classification procedure and an expectation that EALs are primarily for guidance, the process does not ensure that initial decision-making will be consistent and accurate under a variety of conditions. Additionally, response procedures do not ensure prompt personnel accountability. These procedural weaknesses were the dominant contributor to performance weaknesses observed during the tabletop performance tests involving the PSSs. Finally, the emergency plan does not include all of the necessary details, particularly in the area of offsite communication systems.

C.2.3 Offsite Interfaces

The August 2000 OA emergency response exercise evaluation determined that protective action recommendations and information on the nature and extent of the emergency were not communicated

effectively to offsite authorities who make decisions regarding public safety. This ineffective transfer of information resulted in delayed communication of protective action recommendations to the public in the vicinity of the plant. Since that evaluation, the site amended the notification form to conform to offsite requirements, initiated new communication tools such as fax and email, and revised their notification procedures. However, as a result of a series of offsite notification and communication difficulties over the past two years, offsite officials expressed concern that they would not receive initial notification of an emergency in a timely manner.

The integration of site emergency response plans and resources with those of local communities is an important element in establishing an effective site emergency management program. These arrangements also benefit local communities by permitting them to take advantage of resources not otherwise available to supplement their resources for addressing local emergencies. OASO and BWXT have established and are maintaining effective interfaces with these offsite organizations. The OA inspection team noted several strengths in the Pantex offsite interface program; these strengths provide cooperative and supportive information and support to Carson, Armstrong, Randall, and Potter Counties; the City of Amarillo; the Texas Disaster District 5B; and the Texas Bureau of Radiation Control. Particularly noteworthy is the Pantex involvement in the two local emergency planning committees within the surrounding jurisdictions and provision of an offsite interface coordinator who provides daily support to OASO and state and local offsite agencies. EMD and offsite interface coordinator responsibilities include emergency preparedness program coordination; integration of emergency response training, drills, and exercises for offsite responders; and coordination of exercise scenario development and extent of play.

An agreement in principle between DOE and the Texas State Energy Conservation Office provides protocols and financial support that strengthen offsite emergency response capabilities. Additionally, EMD is represented at regularly scheduled agreement-in-principle meetings held with State and local organizations to coordinate the offsite emergency response program with the Pantex emergency management program. Relationships with other state/local organizations are also pre-arranged and formally documented. In addition to the agreement in principle, there are eleven memoranda of understanding (MOUs)/agreements for mutual aid, assistance, and support for the Pantex Site. These MOUs are comprehensive and clearly reflect offsite and onsite expectations. They include provisions for periodic review, coordination, and participation in training, drills, and exercises, and are documented in the emergency plan. However, OASO has designated the position of Emergency Preparedness Manager (currently vacant) as being responsible for developing appropriate mutual aid agreements. The OA team noted that MOUs with the Cities of Panhandle and Amarillo fire mutual assistance have expired. Additionally, the MOU with the Army Corps of Engineers for environmental restoration and waste management group activities is not documented in the emergency plan.

While the overall offsite interface program is well developed and administered, persistent implementation difficulties in the initial offsite notification process have adversely impacted the confidence of offsite organizations in the receipt of timely initial emergency notification. Mechanisms are in place to ensure the transmittal of timely notifications to offsite organizations, including the Albuquerque Operations Office and DOE Headquarters. Tabletop performance tests conducted by OA indicate that PSSs are well aware of the initial notification time requirements and the process for making such notifications. However, previous drills and exercises—and more importantly, the actual October 2002 trailer fire—indicate that some component of the notification system routinely fails to function, so offsite authorities do not receive timely initial notifications. For example, during several drills, a normally manned county agency telephone notification line was busy or not answered, and there were no backup numbers available or steps initiated to ensure notification. Consequently, the affected offsite organization was not notified in a timely manner. Furthermore, during the recent trailer fire, immediately following declaration of the operational emergency, the PSS dispatched initial notification via email to offsite agencies. Due in part to numerous telephone calls resulting from the ERO recall, the PSS opted not to

make the required follow-up conference call to offsite organizations to ensure their receipt and understanding of the emergency notification. Thus, the PSS was unaware that the email notification had not been delivered (and, due to the server setup, would not be for 18 hours). Required telephone notifications were initiated following the arrival of ERO personnel over an hour later, but even then, the Texas Bureau of Radiation Control line was inoperable, and no alternate notification method was pursued. Hence, with the exception of DOE Headquarters, no offsite organization was notified within the required time limits.

Over the past two years, BWXT has implemented various changes to the offsite notification process to address system performance concerns. Although offsite agencies acknowledge these efforts, a number of weaknesses remain:

- The PSS checklist does not include the level of detail described in the notification procedure.
- The notification procedure mixes steps that apply to drills/exercises and actual events.
- The notification process does not require that the notification form be transmitted to DOE Headquarters. Instead, the secondary PSS is required to make a minimal verbal notification by telephone and then be available to answer questions. The notification procedure does not specify what information is to be provided.
- The notification procedure does not identify backup telephone/pager/cell numbers in case a telephone connection is not completed.
- BWXT has not developed or implemented a comprehensive approach for frequent testing of all communication systems.

These weaknesses form part of the basis for Finding #3 (see Section C.2.2).

In conclusion, OASO and BWXT have institutionalized a sound offsite interface program. Both OASO and BWXT have maintained a cooperative and informative relationship with offsite organizations. However, MOUs are not being consistently maintained, and initial notification problems identified during the August 2000 exercise, and regularly communicated to the site by offsite organizations, remain unresolved. However, these weaknesses do not significantly detract from the overall effectiveness of this element. Furthermore, during this inspection, EMD initiated a procedural change that includes immediate telephone conferencing with offsite organizations concurrent with emailing the notification form and subsequent faxing of the form. If adequately implemented, and if combined with a comprehensive set of testing protocols, the revised process should ensure the timely notification of offsite jurisdictions.

C.3 CONCLUSIONS

Although the PEHA provides a generally complete characterization of the site hazards, several shortcomings in critical areas negatively impact its adequacy and effectiveness as a planning and response tool. As a result, not all potential events at Pantex have been adequately analyzed to ensure that plans, procedures, and resources for response have a technically accurate basis. Emergency management plans and procedures generally fulfill DOE order requirements and Departmental expectations. However, significant improvements to the EALs, EAL usage policy, mechanisms for timely categorization and classification decisions, and procedures to provide timely personnel accountability are needed to ensure that initial decision-makers have the tools they need to perform these critical tasks effectively. The fundamental basis and administration of the offsite interface program are commendable and have a

proven record of accomplishment. However, implementation of improvements to the initial notification process and the ensuing resolutions have not been fully effective. OASO line management attention is needed to update the expired MOUs. Furthermore, BWXT line management attention is needed to ensure that all possible steps have been taken to instill offsite confidence in the notification system, such as frequent testing of various notification systems.

C.4 RATING

A rating of SIGNIFICANT WEAKNESS is assigned to the area of hazards survey and PEHA documents.

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

A rating of EFFECTIVE PERFORMANCE is assigned to the area of offsite interfaces.

C.5 OPPORTUNITIES FOR IMPROVEMENT

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

Office of Amarillo Site Operations

- Review and update MOUs with all support organizations. Establish mechanisms to assure that MOUs are kept current.

BWXT Pantex

- Define and implement a process for developing and maintaining a hazards survey and the PEHA.
  - Develop a work plan in accordance with Plant Standard 0282, Compliance Management, for performing the hazards survey and hazards assessment. Ensure that the plan incorporates such elements as DOE requirements and guidance, establishes such standards as scenario assumptions that are uniform across the plant, and provides for multi-disciplinary input to ensure document accuracy. Implement required DOE order definitions, such as emergency classifications, and DOE guidance definitions, such as facility boundary.
  - Consider segregating the hazards survey from the PEHA and documenting all survey information as required by the order. Consider formatting the hazards survey and assessment results in tabular format to enhance these documents' utility as emergency response tools as well as planning tools. Consider including hazard screening documentation in the survey document to reduce the volume of assessment documentation.
  - Establish plant-wide mechanisms for controlling hazardous material inventories and process changes to ensure that EMD is notified of all such changes that may affect the accuracy of the hazards survey and PEHA before the changes occur. Baseline inventories to ensure PEHA accuracy.
  - Continue the effort to quantify hazards from offsite fixed facilities and transportation activities, and implement response tools to mitigate plant consequences in the event of an offsite event.

- Determine the consequences resulting from events involving offsite shipments where DOE/NNSA is the shipper of record. Perform assessments where applicable to assure that response information is immediately available to offsite incident commanders if they seek amplifying information from the site concerning a particular shipment.

- Ensure that protective actions are appropriate for the event consequences.

  - Fully incorporate the DOE ERPG-2 concept for establishing protective action criteria. Utilize DOE temporary emergency exposure limits (TEEL-2) for hazards of interest if ERPG-2 values are not available. Work with the DOE-sponsored Subcommittee for Consequence Assessment and Protective Actions to develop TEEL-2 values for materials of interest where published values are not available. Continue the effort to develop TEEL-2 values based on applicable DOE guidance.

  - Identify all barrier indicators that may be used as thresholds for developing EALs. Propose plant modifications as necessary to add plant emergency event indicators that are symptomatic of hazardous material releases. Correlate and document facility and activity barrier failure indicators with EAL thresholds and required protective action response.

  - Employ dispersion modeling or appropriately scale-modeled results to determine consequences at all receptor distances of interest, such as 30 meters and further, to ensure that all events can be properly classified. Confirm agreement among PEHA results, National Atmospheric Release Advisory Capability (NARAC), and offsite jurisdictions performing consequence assessment activities during emergencies. Resolve and document inconsistencies. Provide PEHA results to NARAC.

  - For transportation events, consider implementation of classification and protective action decision-making based on the 2000 Emergency Response Guide.

  - Include dispersion calculations in the PEHA for a typical set of meteorological conditions for the site. This information would provide some initial perspective to emergency response staff on the severity of an actual event based on actual meteorological conditions.

- Revise the Pantex Plant EPPs to ensure that onsite and offsite emergency responders have clear, comprehensive direction for fulfilling their assigned roles and responsibilities.

  - Revise the emergency plan to provide sufficient scope and detail so that offsite users can understand how key elements provide a comprehensive and timely emergency response capability, and to make it consistent with implementing procedures.

  - Develop a categorization/classification procedure to provide a single source of information regarding response roles and responsibilities, EAL usage requirements, instructions for handling unique situations, management expectations, and a comprehensive set of thresholds for declaring operational emergencies not requiring classification and non-emergency, significant events.

  - Revise the emergency notification form to add a field for the time of declaration of an operational emergency so that offsite authorities are duly informed. Revise the notification process to include DOE Headquarters as a recipient of either the email notification transmittal or a separate facsimile.

- Implement a document control process to ensure that documents are validated before use and maintained.

  - Validate response checklists, job aids, and procedures by performing walkdowns with end users and critically evaluate these documents to ensure that all procedure steps can be performed as written.

  - Review the document control process and revise as necessary to ensure that users have only up-to-date copies of plans and procedures at controlled document locations. Ensure that controlled document locations are established near the end users.

- Enhance personnel accountability processes.

  - Consider assigning responsibilities to facility managers and the PSSs for implementing timely personnel accountability for facilities.

  - Consider having visitors call the operations center when they are on site during off-normal hours and upon leaving the site.

  - Consider using facility sign-in/sign-out logs that can be taken to muster stations by an assigned individual for use in personnel accountability at a facility.

- Ensure that the next revision of the emergency plan and emergency readiness assurance plan include all pertinent information related to MOUs.

- Revise the notification and recall procedure as follows.

  - Modify the PSS checklist and procedure to include backup telephone, cell phone, and/or pager numbers.

  - Update the PSS checklist immediately to reflect new and revised notification procedures.

  - Develop alternative notification methods to cover all contingencies to ensure that offsite organizations receive the initial notification and to include new notification commitments.

  - Revise notification procedure steps to focus on actions to complete during an emergency, rather than during a drill/exercise.

  - Consider documenting a regular testing schedule in PSS shift routines for the various individual elements of the initial notification system.

- Review the document control and revision process to ensure that the emergency plan and supporting procedures provide a consistent set of requirements.

- Consider ways to highlight and enforce the existing policy that discourages telephone call-in by ERO personnel after the ERO is activated, to help avoid placing additional demands on the PSS and operations center staff during the initial stages of an event.

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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 individual facilities or the entire site. 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 (ERO) members an opportunity to practice their skills. An effective emergency public information (EPI) program provides the public, media, and U.S. Department of Energy (DOE) employees with accurate and timely information during an emergency event. In part, effectiveness is based on having in place a long-term program to educate the public and the media about actions that may be required during an emergency response.

The Office of Independent Oversight and Performance Assurance (OA) inspection team reviewed corrective actions developed and implemented as a result of weaknesses in the conduct of the exercise and the EPI element identified during the August 2000 OA emergency response exercise evaluation at the Pantex Plant. As part of the programmatic review of the training, drill, and exercise and EPI elements, the OA team evaluated procedures that support these elements and reviewed training and proficiency records for key site emergency responders.

D.2 STATUS AND RESULTS

D.2.1 Training, Drill, and Exercise Program

Training

BWXT has developed an emergency plan implementing procedure (EPP) that establishes roles, responsibilities, and general requirements for the ERO training and qualification program. While this procedure commits BWXT to performance-based training for ERO personnel, it refers to the plant-wide training standards for details as to how this requirement is to be implemented. The BWXT Safeguards, Security, and Emergency Operations (SS&EO) Division, which has the principal responsibility for implementing the Pantex emergency management program, includes the Security and Fire Departments as well as the Emergency Management Department (EMD). The SS&EO Division's training procedures also commit to the use of performance-based training for SS&EO Division personnel, with some implementation differences from plant training standards due to requirements specific to security personnel. The Office of Amarillo Site Operations (OASO) relies on BWXT for training of OASO personnel who have ERO responsibilities. For OASO personnel, job descriptions include their specific ERO assignments.

The plant training standards describe a systematic approach to be implemented sitewide for identifying training needs, developing appropriate learning objectives, providing task-specific training and qualification of personnel, and evaluating training programs. These standards and SS&EO's annual training plan and training procedures appropriately address initial training and qualification, as well as refresher training and maintaining qualification, for ERO personnel. Through these documents, BWXT

has established clear expectations for ERO personnel to complete all training and qualification requirements before being assigned to a position for which qualification is required. The ERO training program has several other positive attributes. These include the development of a matrix that identifies the training courses and drills/exercises required for qualification; an annual requirement for drill or exercise participation to maintain ERO qualification; and a computer-based system that tracks the participation of each BWXT and OASO ERO member in training courses, drills, and exercises. Additionally, computer-based training is used effectively in annual general employee refresher training to convey information on emergency management topics. Finally, BWXT's efforts following the calendar year (CY) 2001 contractor transition to ensure that senior BWXT managers, who were new to the Pantex Plant, were provided emergency management training specifically related to their ERO duties are noteworthy.

However, weaknesses were noted in BWXT's implementation of emergency management training and qualification program requirements in several important areas. Examples include:

- Replacement personnel are routinely assigned to the ERO roster and assume their duties without having completed required training. Their training does not include a demonstration of competence to perform their assigned duties. At the time of the inspection, 73 of 279 personnel listed on the ERO roster dated October 22, 2002, had not completed all of the initial or continuing qualification requirements for their positions. Nineteen vacancies were identified on the roster.

- Performance-based training has not been formally implemented. For example, a job-task analysis conducted in 1994 was performed at the emergency operations center (EOC) team level rather than at the position level, and the information is not current. Also, the results of this analysis are not reflected in the ERO training program.

- There are no qualification standards for ERO positions (as BWXT uses for other positions, such as radiation protection technicians and security personnel). The training matrices developed for ERO positions track only classroom training and drill/exercise participation; they do not include any practical training.

- The plant shift superintendent (PSS), who has initial responsibility for event classification and categorization, is not provided any formal initial training on these or other emergency-management-related duties. There is no formal annual refresher training for the PSS position.

- The On-Scene Commander (OSCDR) position is not given formal training in all assigned ERO responsibilities. There is no training matrix for OSCDR emergency-management-related training as there are for other ERO positions.

- The BWXT annual requirement that each ERO member "successfully participate" in a drill or exercise is not clearly defined or implemented so as to ensure that each member actually practices the required skills or receives an evaluation of their performance.

- There is no annual ERO training plan. While SS&EO develops an annual training plan that includes EMD, training for ERO personnel is not included in this plan. A considerable amount of ERO training information is either not maintained in an approved document or resides only within the training tracking system; this information would be integrated, better controlled, and easier to manage if included in a training plan.

Of the above weaknesses, the absence of a structured, systematic approach to training ERO personnel on their assigned tasks and the lack of evaluation of competence prior to assignment to the ERO roster are the most significant. Much of the formal training that is currently provided for ERO personnel is not directly related to competent performance as a member of the ERO. Task-specific training is provided informally and is not tracked to ensure that all ERO cadre personnel are provided the necessary training. Under a systematic approach to training, required skills would be assured through either an entry-level requirement or a training requirement for position-specific qualification; such an approach would ensure that all ERO personnel receive the training they need before being assigned to work independently as part of the ERO. Finally, discussions indicated that one of the principal challenges to ensuring that training requirements are met is the volunteer status of most BWXT personnel on the ERO roster. In the past, some individuals have resigned from the ERO if pressed to meet their training requirements. Thus, the current system does not promote the establishment and maintenance of a fully staffed and qualified ERO.

Finding #4: The Pantex emergency management training program does not ensure that ERO personnel have been trained and qualified in their assigned tasks, as required by the Pantex emergency plan and plant training standards.

Drills and Exercises

The drill program, an integral part of the ERO training program, is formally defined by a plant standard that applies to all divisions at Pantex. By requiring approved drill guides and post-drill critiques, the program provides structure and formality for both standard-level drills, which focus on response at the facility level or first-responder level, and site-level drills, which involve multiple response organizations. BWXT has conducted numerous drills, including 14 site-level drills in CY 2002, in order to achieve its objective of exercising all ERO responders on an annual basis. For fiscal year (FY) 2003, drills are scheduled to include on-scene command, radiation release, fire, hazardous material spill, joint information center (JIC) activation, fire with evacuation, personnel accountability, and chemical release.

The exercise program is formally defined to include the elements of exercise planning, conduct, evaluation, critique, and reporting. Exercises have involved the critical response positions within the ERO at least once over the past three years; this frequency is consistent with BWXT expectations, largely based on the scope of the full participation exercise conducted in March 2000. Since then, the frequency of the exercises has been reduced to once per year, and their scope is more limited. Consequently, BWXT may be challenged to continue to evaluate (via exercises) all elements of the emergency management program within the required three-year interval. Furthermore, based on direction from OASO, BWXT has reduced the drill frequency as well. Nonetheless, considered collectively, the scope and frequency of drills and exercises provide appropriate opportunities for Pantex to develop and maintain ERO proficiency.

With some exceptions, the process for conducting and evaluating drills and exercises is adequately defined by plant procedures. To ensure adequate support, controllers and evaluators receive appropriately detailed classroom instruction. However, post-drill and exercise critiques indicate that additional training and more detailed pre-briefings are warranted for controllers and evaluators to conduct the planned event more effectively. The exercise packages and drill guides are developed using a master list of objectives that encompass many of the critical ERO response elements. As written, these objectives are broad in scope and therefore require supporting evaluation criteria to measure successful performance. The BWXT evaluation criteria typically identify generic response actions, but they are not normally tailored to identify the specific performance expectations for the individual exercise scenario and are only infrequently used in evaluating drills. Finally, acceptance criteria for the satisfactory performance of a drill or exercise are not clearly identified, resulting in incomplete post-drill critiques. While tabletop

exercises conducted during this inspection did not indicate any performance problems resulting from significant weaknesses in training or proficiency, the reduction in drill and exercise frequency over the past two years emphasizes the need for a thorough and comprehensive evaluation of those that are conducted. The results of these evaluations should be used to determine not only the adequacy of program procedures and performance, but also the scope and frequency of future drills and exercises, as required by current plant procedures.

BWXT's implementation of the drill and exercise programs, described above, does not ensure that the drill guides, exercise packages, and related critiques are critically developed, reviewed, and evaluated to promote the identification and correction of program and performance findings, as indicated by the following:

- Drills were evaluated as "satisfactory," with no findings, even though specific objectives were not fully met.

- During a site-level drill, the expected actions identified for the Fire and Security Departments were in conflict with the Pantex On-Scene Commander Policy, which was implemented two months before the drill. This drill was approved, conducted, and evaluated without this conflict being identified.

- The inability to make the required emergency notifications promptly and accurately during an exercise was not identified as a finding that would result in corrective actions.

- Findings from drills are not consistently entered into the consolidated findings report or tracking system, thus limiting the opportunity to identify, evaluate, and correct recurring weaknesses. Over the past two years, only four findings have been entered into the consolidated findings report, although a sampling of seven drill critiques identified more than 20 findings.

- Drill critiques completed by Pantex organizations outside of EMD typically are not provided to EMD for review and evaluation as required by plant procedure. This is a missed opportunity to evaluate drills for programmatic or plant-wide impact and to develop corrective actions as appropriate.

- The FY 2001 no-notice exercise resulted in not meeting one of the six exercise objectives; however, the evaluation report developed by the NNSA Office of Emergency Operations contained no related findings, and the suggestions for improvement only partially addressed the noted weaknesses. As a result, the necessary corrective actions were not developed or implemented.

- The FY 2001 no-notice exercise was not separately evaluated by BWXT, which is inconsistent with an internal requirement that an evaluation report be developed for each exercise. As a result, BWXT did not benefit from the observations of the Pantex employees who were involved in the planning, conduct, and evaluation of the exercise. This weakness was self-identified by BWXT, resulting in the development of an evaluation report following the FY 2002 no-notice exercise.

Finding #5: The BWXT drill and exercise evaluation process does not ensure that program and performance weaknesses are identified and corrected, as required by the Pantex emergency plan, the plant standard on drills, and the exercise program implementing procedure.

In conclusion, the training, drill, and exercise programs have well-defined procedures for developing, maintaining, and evaluating ERO performance and programs. While BWXT has established the framework for an effective ERO training program, these requirements are not being effectively

implemented. The result is that the training system does not ensure that all ERO personnel receive the training they need to carry out their assigned duties. There is also no formal assessment of ERO personnel competence as part of the qualification system. Additionally, personnel are assigned to the ERO roster without having completed required training. The drill and exercise program has been successful in providing a baseline of proficiency for at least a portion of the ERO cadre. However, the implementation of the existing evaluation and critique process does not provide assurance that observed weaknesses in performance or program elements are evaluated for appropriate corrective actions to provide ERO personnel with the necessary knowledge, skills, tools, and procedures to prevent a recurrence of the weakness and to ensure that all personnel remain proficient in their ERO-related tasks.

D.2.2 Emergency Public Information

In the August 2000 OA emergency response exercise, ERO staff demonstrated a good understanding of their roles and responsibilities in performing their assigned EPI tasks, and JIC participants supported and interacted well with offsite organizations. However, the site did not demonstrate the ability to provide the JIC and the public with accurate and timely information regarding the release of radioactive material, so the public remained unaware of such significant emergency issues as the potential consequences of not taking shelter. In addition, in a number of instances the lack of procedures to guide the staff hampered their response actions. Since that evaluation, media monitoring and telephone inquiry operations have been moved from the JIC to the emergency press center (EPC), the public information center was eliminated, and EPC and JIC procedures/checklists were updated and amended. BWXT has recognized that in making these changes, some processes were not adequately defined and the corresponding corrective actions did not provide integrated, position-specific procedures and/or checklists.

The OASO Public Affairs Office and the BWXT Business Development and Communications Department are responsible for disseminating emergency information to employees, the public, the media, and other stakeholders. This function is conducted in accordance with the EPI program plan, which serves as a combined emergency public information plan and procedure set that describes program elements and provides supporting checklists for activating and managing the EPC and the JIC. During an emergency, OASO and BWXT are responsible for providing and developing the information necessary to accomplish the emergency public information function and for providing technical advisors to the EPC (co-located in the EOC) and senior spokespersons to the JIC.

The OA inspection team noted several strengths in the Pantex EPI program. The EPI plan provides both direction to EPI staff and details for coordinating personnel, resources, and facilities. The EPC procedures and checklists include specific provisions for developing and approving news releases, clearly identify the individuals authorized to approve the release of information to the public (i.e., the OASO Public Affairs Officer and Emergency Manager), and include requirements for classification review of all information prior to release. EPC and JIC procedures also include detailed provisions for activating the JIC and coordinating EPI efforts with Federal, state, and local organizations. In addition, the site has developed an aggressive public education program that provides a speakers bureau; a proactive community and media plan dealing with information regarding plant operations; a dedicated public education person to address calls from site neighbors; and support to the state in the development of emergency response information sent to all residents in the surrounding counties.

While some EPI processes are well planned and appropriately documented, there are a few programmatic weaknesses related to the EPC. The most important of these is that the EPI plan calls for the initial release of information within 30 minutes to one hour of staff arriving at the EPC. This is not consistent with Departmental expectations that the initial news release be issued within approximately one hour of the event classification. While the site has developed three news release templates for use during emergencies, none are appropriate for use as the initial release, and none are pre-approved as required by

the EPI plan. It was noted that in response to an actual event – the October trailer fire – the news release templates were not used.

Additionally, while television monitors have been placed in the EPC, no one has been assigned responsibility for media monitoring, and procedures do not address the review of media coverage for inaccuracies, rumors, or public misperceptions. Although required by the EPI plan, there are no procedures for responding to inquiries, including rumor control. The plan also tasks the emergency telephone operators (ETOs) to disseminate information obtained from the EPC to the plant population, the public, and the media. However, the plan does not include a process for ETOs to obtain, document, and forward for resolution any questions they cannot answer. The ETO emergency handbook, used by operators during an emergency, includes vital information. However, with the exception of adding the last revision of the checklist, it has not been updated since 1999.

Not all operational changes that have been made since 2000 between the EPC and JIC have been incorporated into procedures and checklists. Additionally, while the JIC staff has received specific training, there has been no position-specific training provided for members of the EPC. BWXT has self-identified these weaknesses and is actively working to correct procedures and checklists and develop EPC lesson plans.

To summarize, Pantex has an effective EPI program that is commensurate with identified site hazards. The program is defined by a framework of procedures and is successful in large part in such areas as the public education program due to the knowledge and experience of the EPI staff. However, position-specific procedures and checklists have not been updated to reflect the current roles within the EPC and JIC functions, and position-specific EPC training has not been conducted. Both these issues were self-identified by BWXT, and corrective actions are in progress.

D.3 CONCLUSIONS

The Pantex training, drill, and exercise program has well-defined procedures to develop, maintain, and evaluate ERO performance and programs. Many drills and exercises are conducted, and collectively they provide appropriate opportunities for the site to evaluate all critical ERO positions. However, as implemented, these programs do not ensure that personnel are provided with the necessary training, tools, and procedures to become and remain proficient in conducting their ERO-related tasks. The EPI program at Pantex is based on comprehensive planning and is supported by subject matter experts. While the JIC is supported by integrated procedures, BWXT has recognized that weaknesses in EPC procedures may limit the effectiveness of mechanisms to keep employees and the public informed.

D.4 RATING

A rating of NEEDS IMPROVEMENT is assigned to the area of Pantex training, drills, and exercises.

A rating of EFFECTIVE PERFORMANCE is assigned to the area of emergency public information.

D.5 OPPORTUNITIES FOR IMPROVEMENT

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

BWXT Pantex

- Strengthen the ERO training program by implementing position/task-specific training requirements.
  - Consider using the position-specific task lists for all ERO personnel (which are used as job aids in the EOC) as a basis for job analysis to identify required training for these personnel.
  - Review the lesson plans used for ERO classroom training (such as the Incident Command Group lesson) to ensure that learning objectives and associated training materials are directly relevant to Pantex Plant emergency management methods. Include in these lesson plans a set of learning objectives to demonstrate performance of ERO tasks.
  - Develop training matrices for all ERO positions, not just those listed on the ERO roster. Ensure that these matrices include practical training (such as on-the-job training) as well as classroom training, drills, and exercises.
  - Implement selection criteria for BWXT ERO positions so that when division managers nominate replacements for their personnel on the ERO roster, there is a standard basis for determining what additional training they need to become competent in carrying out their assigned ERO tasks. Implement a mechanism to improve the stability of the ERO roster, such as the approach taken by OASO to include ERO responsibilities in job descriptions.
- Prepare an annual training plan. Examples of information that could be included in an annual training plan are: drill/exercise objectives and associated criteria; training matrices for ERO personnel; training, drill, and exercise schedules; and goals, objectives, and progress toward achieving these objectives. An annual training plan would also allow OASO to provide more effective control over ERO training and qualification and avoid the use of verbal direction to supersede approved procedures.
- Establish a mechanism to ensure that remedial training, such as that identified as a corrective action to address identified performance weaknesses, is not a one-time fix, but rather that associated initial and continuing training materials are also revised.
- Strengthen the drill and exercise program by enhancing the objective development and validation processes.
  - Review the master list of objectives and the supporting evaluation criteria used for developing drills and exercises to ensure that they reflect recent changes in emergency response policy and organization and provide a comprehensive evaluation of all elements of the ERO.
  - Use the master list of objectives during the planning phase of the annual drill and exercise schedule to validate that all ERO functions are evaluated on a periodic basis and to provide sufficient training opportunities.
  - For drills, include objectives and evaluation criteria to measure individual performance to ensure that drill participants benefit from the training opportunity through performance feedback.

- For each specific drill and exercise, consider tailoring the evaluation criteria to reflect the expected timeline and master scenario events list. This would provide the evaluator with event-driven criteria to use in the observation of program and performance elements.

- Enhance controller and evaluator training and evaluate the effectiveness of the pre-briefings to ensure satisfactory control and evaluation of drills and exercises. For example, consider including the review and development of a critique as part of the training for an evaluator.

- Identify and document the criteria to be used for evaluating successful participation in a drill or exercise to meet ERO members' annual participation requirements.

- Consider implementing mechanisms to designate individuals who have been nominated as members of the ERO but who have not yet completed all training and qualification requirements (or who have not kept their qualifications current). One alternative is to identify such individuals on the ERO roster as being in an "under instruction" or "not fully qualified" status. This mechanism should also clearly define and document limitations on such individuals' participation in responding to an actual emergency, as well as drills and exercises.

- Clarify expectations for the timeliness of the initial news release in the EPI plan. Emphasize the use of a pre-formatted, pre-approved initial news release to rapidly disseminate initial information during normal working hours and for an off-hours incident.

- Consider the following to improve the effectiveness of the EPC and JIC.

  - Develop a process for media monitoring including identification of misinformation, trends, analysis of issues, and public and media perceptions needing resolution.

  - Develop a process for rumor/misinformation control between the ETOs and the ERO, including all the mechanisms to transfer information between the functions.

  - Develop a process to allow the ETOs to provide answers to media and public questions from the ERO. Provide guidance or criteria as to what is or is not approved information. Consider including status board information, approved news releases, chronologies, fact sheets, news conference notes, and resource books.

  - Develop a mechanism for capturing information released to the media during news conferences and route that information back to the EPC and the ETOs.

  - Review and clarify the classification definitions in the EPI plan and the ETOs' emergency handbooks.

- Ensure the consistency and functionality of EPI plans and procedures.

  - Consider conducting a crosswalk of all EPI procedures to ensure consistent definition of roles and responsibilities and integration of the procedures. Ensure that each procedure has specified mechanisms linking the movement of questions, answers, and/or issues to and from all positions involved.

  - Review anticipated employee, public, and media telephone inquiries against the current staffing plan and resource layout to ensure adequate telephone coverage during an event.

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 the categorization and classification of the emergency, formulation of protective actions, and notifications to 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.

In the event of an emergency, initial direction and control of the Pantex Plant emergency response organization is provided by the primary BWXT plant shift superintendent (PSS), with support within the operations center from the designated secondary PSS and an on-shift administrative aide, and at-scene support being provided from the on-scene commander. As the interim emergency operations center incident commander, the PSS is responsible for emergency classification, protective action decision-making, recall of the emergency response organization (ERO), and notification of onsite personnel and offsite authorities until relieved by the BWXT incident commander and the Office of Amarillo Site Operations (OASO) emergency manager.

Most of the information in this section consists of observations from tabletop performance tests that were conducted by the Office of Independent Oversight and Performance Assurance (OA) with two PSS teams and three on-scene command group teams. Two operational emergency scenarios were presented to each PSS team: a malevolent act resulting in a release of hazardous material at the shipping and receiving warehouse, and a tritium release with potential burning of special nuclear material at a weapons assembly/disassembly facility. The malevolent act scenario was presented to each on-scene command team. The scenarios, which were developed by BWXT trusted agents in conjunction with the OA inspection team, were presented to these individuals by the trusted agents to ensure scenario validity and delivery of accurate event cues. In addition, performance-based interviews were conducted with three OASO emergency managers.

E.2 STATUS AND RESULTS

E.2.1 BWXT Emergency Response Decision-Making

The on-scene command strategy at Pantex is a two-tiered approach. The first responders, who consist of Fire and Security personnel, assume initial on-scene command and control. When both departments are on-scene, Security normally assumes command and control using turnover protocols, as necessary. The first responders are always available to perform emergency response duties until relieved by a “mature” On-scene Command Group (OSCG). The mature OSCG is a recalled response organization consisting of senior representatives from the security, fire, safety, and radiation safety departments. Once the mature OSCG is activated, it locates near the scene in a mobile command vehicle and relieves the first-responder on-scene commander, again using turnover protocols. The mature OSCG members are on site during normal working hours but must be recalled from off site at other times; this process may take up to two hours.

Plant Shift Superintendents

The August 2000 OA emergency response exercise evaluation determined that the PSS understood his responsibilities and performed most actions well, including quick recognition and assessment of the possible extent of the emergency, prompt and accurate emergency classification, and issuance of onsite protective actions. However, notifications were not performed accurately, and some actions, such as performance of personnel accountability, were inappropriately delayed. Since 2000, protocols have been revised to improve the timeliness and accuracy of initial PSS emergency response duties, particularly for offsite notifications, but ambiguous and missing components within the emergency action level (EAL) set and current accountability protocols continue to cause inappropriately delays, as discussed in Appendix C of this report.

During the tabletop performance tests, the PSSs demonstrated generally effective categorization, classification, offsite notification preparation and transmittal, and implementation of pre-determined protective actions. With few exceptions, PSSs effectively used their available job aids, checklists, procedures, EALs, and equipment to categorize, classify, notify, and implement protective actions within required time limits. PSSs recognized changing conditions and, in most cases, appropriately performed follow-up classification, protective actions, and offsite notifications. A noteworthy practice implemented since the August 2000 exercise is the use of two fully qualified PSSs in the operations center. This team concept is a significant contributor to the timely performance of PSS duties, particularly when coupled with job aids, such as checklists and other reminders, and the appropriate division of assignments.

The OA team observed several notable performance weaknesses. In one case, an Alert classification was not upgraded to a General Emergency even though the appropriate confirmations were present. Consequently, the PSS implemented non-conservative protective actions for site workers. In another case, the PSS inappropriately delayed the categorization of a security event that might have involved the release of hazardous materials by approximately 15 minutes, even after all the required indicators were present, because of difficulties in interpreting the available operational emergency thresholds. In both cases, the PSS difficulties can be attributed in large part to ambiguous and incomplete EALs, compounded in one case by an inappropriate EAL implementation judgment permitted by the EAL usage protocols established by Emergency Management Department. PSSs also did not initiate personnel accountability in a timely manner, primarily because of poor sequencing in operations center checklists and procedures. These procedure-related weaknesses are described in more detail in Appendix C.

On-Scene Command Group

The August 2000 OA emergency response exercise evaluation determined that the on-scene command group was not effective in ensuring timely rescue and treatment of the injured, ensuring the safety of emergency responders, and ensuring a common understanding of the event scene status. To address these weaknesses, BWXT has established an on-scene command policy, developed new and enhanced existing response checklists, taken actions to ensure that appropriate medical and radiological equipment are available at the scene, and provided additional training. These corrective actions have improved the operation of the on-scene command function, as demonstrated during tabletop performance tests.

During the tabletop performance tests, the on-scene commanders demonstrated effective command and control and implementation of their response duties, in accordance with BWXT policies. The first responders to the scene, who were Fire Department responders (controlled through the scenario by injects), established an incident command post and assumed command until relieved by a Security first responder, using turnover protocols established in the associated policy statement. The on-scene commander effectively cordoned the event scene, including utilization of local law enforcement and plant assets to establish road blocks. Both Fire Department and Security on-scene commanders demonstrated

concern for responders as they considered potential hazards and meteorological conditions throughout the scenario. Command posts and guard posts were relocated as required to ensure personnel safety while still maintaining an effective event response.

The first responders are knowledgeable of available tools and response assets. Medical "jump kits," maps, communication systems, hazardous material and medical response vehicles, radiological and industrial hygiene support, and county support assets were discussed during the tabletop and subsequent interviews. However, many of these assets were not deployed during the tabletop tests, apart from establishing isolation zones, because the security on-scene commander restricted their use due to security concerns. Therefore, these assets were placed in a standby mode, and no fire fighting or life-safety activities were initiated. These restrictions made by the on-scene commander (with concurrence by the Fire Department shift commander) are consistent with the on-scene command policy and BWXT management expectations, and were appropriate given the security implications of the tabletop scenario presented.

The initial on-scene command group has a very limited selection of planning tools to support tactical decisions and prepare for a response. For example, the Fire Department responders lack tools to determine specific hazards within a building and instead relies on reports from the facility manager, the PSS, experience, and (to some extent) pre-fire plans. The Security first responders do not use any response tools, other than maps, when assuming command and control or making tactical decisions. The Fire Department now uses some tools that were implemented as a result of weaknesses identified during the August 2000 exercise, such as checklists, worksheets, and the emergency response guidebooks, but their use during the tabletop exercises was sporadic and inconsistent. An on-scene commander checklist, which addresses Fire Department and Security on-scene commander items, was developed to address weaknesses from the 2000 exercise but was not used. This checklist provides a comprehensive set of considerations for the on-scene commanders, but first responders were not aware of its existence. Subsequent interviews determined that this on-scene command checklist is intended to be used only by the mature OSCG (i.e., part of ERO recall) from the mobile command vehicle. Expanding its use to the first responder on-scene commander, and providing related training, would further enhance response performance because all these individuals face the same decisions as the mature OSCG, particularly when the mature OSCG members must be called in from off site. During this inspection, the site implemented an appropriate interim security response checklist for use by first responders.

In summary, BWXT initial decision-makers demonstrated generally effective response during tabletop performance tests. With some exceptions, due primarily to weaknesses in EALs and other procedures, PSSs executed their emergency responsibilities effectively. Furthermore, BWXT has implemented effective corrective actions to improve on-scene command and control to ensure the safety of response personnel, and to ensure that appropriate response equipment is provided at the scene, as evidenced by initial on-scene command personnel performance. Further performance enhancements can be achieved by extending the use of the mature OSCG checklist to first responders and through a more consistent use of available tools by all first responders.

E.2.2 OASO Emergency Response

Interviews were conducted with three individuals from OASO assigned to serve as the emergency manager to determine whether they understood their emergency response roles and responsibilities as defined by the emergency plan and emergency preparedness procedures. The primary responsibilities of the emergency manager include ensuring that the contractor appropriately responds to the event, ensuring that appropriate event classification and notifications are made, interfacing with offsite organizations, and reviewing/approving press releases.

OASO emergency managers are knowledgeable of their response roles and responsibilities, which are consistent with (and in some cases are more definitive than) program documents and reflect appropriate priorities. In particular, they recognize their role in providing ERO oversight and ensuring coordination with offsite organizations, including the Department of Energy/National Nuclear Security Administration. They understand that the primary goal is the protection of site workers and the public, as well as the importance of timely and accurate notifications and communications.

To summarize, the OASO emergency managers demonstrated a thorough understanding of their roles and responsibilities for an emergency response. Interviews confirmed that stated responsibilities and priorities were consistent with the overall planned emergency response activities for Pantex.

E.3 CONCLUSIONS

In conclusion, PSS teams demonstrated generally effective performance in conducting emergency response duties using available procedures, job aids, and equipment during tabletop performance tests. However, some of the procedure-related response weaknesses originally identified during the August 2000 exercise evaluation remain. The on-scene command crews also demonstrated improved performance since the August 2000 exercise by establishing clear command and control and by taking appropriate measures to protect on-scene responders. The results of the tabletop performance tests, combined with the clear understanding of response roles and responsibilities on the part of OASO emergency managers, provide confidence that the Pantex ERO can respond effectively to a wide range of site events.

E.4 RATING

A rating of EFFECTIVE PERFORMANCE is assigned to the area of BWXT emergency response decision-making.

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

E.5 OPPORTUNITIES FOR IMPROVEMENT

This Independent Oversight review identified the following opportunities for improvement. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and evaluated by the responsible DOE/National Nuclear Security Administration and contractor line management and prioritized and modified as appropriate, in accordance with site-specific programmatic emergency management objectives.

BWXT Pantex

- Strengthen training and first-responder tools to better support initial emergency response actions.
  - Emphasize the use of first-responder tools, such as checklists, emergency response guidebooks, and pre-fire plans and required documentation, during training sessions.
  - Consider developing building run sheets to give Fire Department responders a quick way to determine the type and quantity of hazardous materials that may be stored in buildings.
  - Consider giving the first responder on-scene commander the more comprehensive checklist currently used by the mature on-scene commander, to better support a safe and timely response.
- Evaluate and improve the reliability of installed instrumentation used for decision-making by PSSs.

APPENDIX F

Readiness Assurance

F.1 INTRODUCTION

The readiness assurance program provides the 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 the active involvement of National Nuclear Security Administration (NNSA) line organizations in monitoring program effectiveness, contractor self-assessment programs, 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 examined the processes by which the Office of Amarillo Site Operations (OASO), the Albuquerque Operations Office (AL), and the NNSA Office of Defense Programs provide guidance and direction to and maintain operational awareness of the Pantex emergency management program. The inspection also included a review of BWXT emergency management self-assessments and reviewed the status of actions taken to address program weaknesses previously identified during the August 2000 emergency response exercise evaluation that was conducted by the Office of Independent Oversight and Performance Assurance (OA), as well as weaknesses identified by AL and NNSA.

F.2 STATUS AND RESULTS

F.2.1 NNSA Assessments and Performance Monitoring

Two NNSA offices, OASO and the AL Transportation and Emergency Operations Division (TEOD), have had responsibility for maintaining operational awareness of and providing guidance to the Pantex emergency management program. OASO has primary responsibility for providing line management oversight for the site's emergency management program. As part of the cognizant operations office, TEOD also had responsibility for emergency management line management oversight activities at Pantex. The TEOD role has been significant due to the limited OASO resources available in the emergency management area. AL/TEOD has historically supported the oversight of the Pantex emergency management program by conducting assessments and evaluating annual exercises. As a result of the NNSA reengineering initiative, AL will not be conducting oversight activities in support of OASO after December 15, 2002. OASO is actively engaged in the development of plans, site-level agreements, and delegation of authorities in preparation for NNSA reengineering.

TEOD has performed a variety of operational awareness activities related to the Pantex emergency management program. During August 2001, a team conducted a baseline study of the emergency response capabilities for the Pantex Plant. The report identifies strengths and weaknesses in the current emergency management program, as well as areas that will require significant effort and resources to comply with DOE Order 151.B, should it be approved. This high-level study provided recommendations for consideration but was not intended to provide a comprehensive evaluation of the program. Because the study was limited in scope and depth, OASO and BWXT used it for information only. As a result, OASO and BWXT missed an opportunity to address weaknesses that were confirmed by this OA

inspection, such as the absence of a proceduralized categorization/classification procedure as mentioned in Appendix C.

The NNSA Headquarters Office of Emergency Operations (NA-40, formerly SO-40) conducted and evaluated a no-notice exercise in August 2002 that was also evaluated by TEOD and OASO. The results of the exercise evaluation were compiled by NA-40 and formally transmitted on October 15, 2002. Pantex failed one exercise objective in that the emergency response organization (ERO) did not establish effective control at the event scene. OASO agrees that the objective was not met but attributes the cause to an emergency operations center (EOC) working group communicating directly to on-scene responders, and not a weakness in the on-scene command and control as indicated by the NA-40 report. OASO has requested a change to the report, and identification of corrective actions is awaiting the resolution of this issue.

TEOD also developed an exercise evaluation report that was received in draft form but has not been formally transmitted to OASO. The draft report provides meaningful feedback on responder performance and the conduct of the exercise. TEOD also included in their evaluation secondary objectives to validate corrective actions from the OA exercise evaluation in fiscal year (FY) 2000. Although not all corrective actions could be validated due to team size and the specifics of the exercise scenario, three instances of ineffective corrective actions were identified. Most notable were weaknesses in command and control. An evaluation of weaknesses to identify and assign corrective actions is pending issuance of the final report.

In addition to exercise evaluations, OASO has been actively engaged in providing oversight and guidance in defining program requirements. For example, OASO required BWXT to reanalyze and provide the technical basis for the ten-mile emergency planning zone as a condition for approving the emergency plan. OASO also conducted an assessment of site fire protection in February 2001, which resulted in BWXT developing a Pantex Plant Fire Department baseline needs assessment document. OASO oversight activities have also included review and approval of the Pantex Plant emergency hazards assessment (PEHA), emergency readiness assurance plan, and emergency procedures. Roles, responsibilities, and requirements for line management oversight of the Pantex emergency management program are clearly established in a site office procedure, *Emergency Management Oversight Program.*

OASO also provides feedback to the contractor through the performance evaluation program that is used to determine award fee. The performance expectation for FY 2002 was to conduct challenging and credible site-level drills and exercise(s) to validate the readiness of the Pantex Plant ERO. OASO indicated that the FY 2002 award fee will be based not only on the number of drills and exercises but also on demonstrated performance. Performance measures for FY 2003 were being developed at the time of this OA assessment. OASO indicated that emergency management may be grouped with other core functions considered basic to the operation of the site, such as safeguards and security; environment, safety, and health; and facilities and infrastructure. Although visibility for the emergency management program may be reduced, the fee available to be awarded or withheld could be increased. OASO indicated that a revision of FY 2003 performance objectives would clarify that the emergency management program is one of the core functions.

Although OASO has been actively involved in review and approval of program requirements documents, performance monitoring activities have not been conducted that would identify programmatic weaknesses, such as those in the PEHA, emergency action levels (EALs), and training. There is no established program for conducting a thorough assessment of the emergency management program over a three-year period as required by DOE Order 151.1A. Additionally, OASO approved the BWXT Safeguards, Security, and Emergency Operations (SS&EO) Division self-assessment schedule discussed below, which does not meet NNSA/DOE expectations.

OASO's effectiveness in monitoring the implementation of specific emergency management program elements has been significantly hindered by the absence of an emergency management subject matter expert in the emergency management program manager position. OASO has been aggressive in their efforts to identify a suitably qualified individual to fill this position, but a hiring freeze within NNSA and uncertainties regarding the NNSA reengineering initiative have made filling this position difficult. The OASO manager has identified the emergency management program manager position as a "critical" position for the NNSA reengineering initiative.

Finding #6: OASO has not established a program for conducting assessments of the Pantex emergency management program, as required by DOE Order 151.1A, and has not been effective in identifying program weaknesses.

In conclusion, OASO, supported by TEOD, has conducted a variety of activities to monitor the performance of Pantex Plant emergency management program. OASO has been actively engaged in providing oversight and guidance in defining program requirements. However, performance monitoring activities have not been conducted that would identify significant programmatic weaknesses, and there is no established program for conducting a thorough assessment of the emergency management program over a three-year period, as required by DOE Order 151.1A.

F.2.2 Contractor Assessments and Issues Management

Self-Assessments

The Pantex emergency plan requires that assessments of the emergency management program be conducted in accordance with the Pantex Plant standard for the SS&EO Division self-assessment program. This standard includes adequate provisions for planning, reporting, corrective action development, and verification of corrective action completion. The Emergency Management Department (EMD) Manager is responsible for implementing this standard for emergency management. Additionally, the Quality Assurance Division independent assessments program has included an evaluation of the emergency management program against selected criteria from the Mission Support standards/requirements identification document (S/RID).

The EMD self-assessment program is designed to evaluate the elements of the emergency management program over a three-year period. Assessments of three program elements have been performed annually for the past two years. The EMD manager initially determines which elements will be included in the annual schedule, but the SS&EO Division Manager and OASO approve the schedule. Findings are tracked in a local database maintained by the division self-assessment coordinator. Enhancements of the EMD self-assessment process for FY 2003 include:

- Initiating non-conformance reports (a sitewide system) for tracking findings
- Assessing five program elements per year
- Formally adopting the evaluation criteria contained in DOE Guide 151.1A, Draft, Volume VI.

Even with these enhancements, the emergency management self-assessment program does not meet either BWXT requirements or DOE expectations in terms of frequency, scope, or rigor. The emergency plan requirement to review the entire program over a three-year period will not be met because, of the five program elements scheduled for review in FY 2003, two were evaluated in FY 2001 or 2002. This schedule will extend the time to assess the entire program beyond three years (unless additional elements are added over the next two years). Furthermore, BWXT did not identify any weaknesses in the elements

that were previously assessed in FY 2001 or 2002 and that are being repeated in FY 2003, calling into question the reason for their selection this year. The three-year assessment program also does not meet DOE expectations to evaluate the program annually, which was identified by AL in a baseline capabilities study issued in January 2002. EMD's rationale for this approach is that the assessments will provide more useful information because individual program elements can be evaluated in greater depth (although at a lesser frequency). However, some BWXT self-assessments have not evaluated all of the criteria associated with each element, and the OA team noted that BWXT has identified no discrepancies and only three recommendations from self-assessments during the past two years.

In several instances, self-assessments did identify weaknesses, but because they were described in the "observations" section of the report and were not identified as discrepancies, no corrective actions were required. For example, an assessment of protective actions and reentry conducted in August 2002 observed that the protective action procedure does not delineate the role of the on-scene commander with regard to that time-sensitive emergency response, yet no discrepancy or recommendation was identified. Similarly, the Quality Assurance Division conducted an assessment in July 2002 that focused on selected criteria from the S/RID. Although the report identifies out-of-date manuals in the EOC, no non-conformance reports (NCRs) were generated. The inspector did not consider this to be a non-compliance because he was told that hardcopies are only considered a backup to the official copies obtained from the site intranet. However, the plant shift superintendents did use hardcopy procedures during tabletop performance tests. Although not procedurally required, EMD responded to the Quality Assurance Division assessment by providing plans for corrective actions. However, those corrective actions did not address the root cause of the problem regarding the use of out-of-date procedures. OA team members found out-of-date documents in the operations center, including notification forms, the ERO roster, and an occurrence reporting procedure.

EALs were another subject of the July 2002 Quality Assurance Division assessment. The Quality Assurance Division inspector indicated that his review of the EALs verified that the EALs existed for the event conditions identified in the PEHA. The conclusion in the assessment report that the EALs contain observable criteria for detecting, recognizing, and determining the classification of emergencies is not justified by the Quality Assurance assessment activity. Additionally, this conclusion is not consistent with the results of this OA EAL review, discussed in Appendix C.

Finding #7: BWXT emergency management self-assessments are not sufficiently rigorous to consistently identify programmatic weaknesses, and program elements are not assessed annually, as required by DOE Order 151.1A.

Issues Management

Consistent with DOE Order 151.1A, the Emergency Management Mission Support S/RID (criteria 3.1.7.a) states that the emergency management program includes a system to track and verify correction of findings or lessons learned from training, drills, exercises, and actual responses. EMD tracks drill and exercise findings by performance objective on a local system, making it a useful tool for planning exercises and drills as well as self-assessments. The SS&EO Division self-assessment coordinator tracks issues identified by self-assessments on a local system at the division level. (A procedure revision is in development that will require self-assessment findings to be tracked by site-level NCRs.) Issues from such external sources as Quality Assurance Division and OA assessments are tracked as NCRs through a sitewide tracking system. Emergency response issues from the Fire Department baseline needs assessment are tracked on project management software by the Fire Protection Engineering Manager. Although all these systems provide the means to effectively track issues and verify corrective actions, the fragmented and localized approach to tracking does not facilitate the identification of common or

reoccurring deficiencies, and these issues do not receive the management attention of the more visible NCR process.

BWXT has implemented several program enhancements since the August 2000 OA exercise evaluation. For example, the following enhancements are completed or in progress:

- The electronic notification process reduced the time required for offsite notifications.
- The plant public address system was upgraded.
- WebEOC software has been purchased and programming is in progress.
- Major equipment procurement for improved fire fighting capabilities is in progress.
- Map overlay capabilities are being improved for use with plume modeling software.
- Locations for an alternate EOC are being evaluated.

As stated above, BWXT initiated a Pantex Fire Department baseline needs assessment and issued a report in January 2002. Almost all of the issues identified in the baseline need assessment have been included in a comprehensive project that is being managed by the Fire Protection Engineering Manager. For those issues that are not included in the project, a written justification has been provided. Progress on this project is being tracked and managed through the P3 project management system. Discussions indicated that these actions are not tracked by the NCR process because scheduled activities may slip for reasons beyond the control of the fire protection engineering group, but approval for due date changes for NCRs are not easily obtained.

BWXT has a plant standard that defines the process for evaluating actual events in order to identify immediate corrective actions and assign responsibility for root cause analysis and longer-term actions. A critique was held for the October 20, 2002, fire, categorized as an operational emergency not requiring further classification. The critique focused on the causes of the fire and did not address response activities. However, EMD conducted a separate, informal meeting to identify emergency response lessons learned. Weaknesses and corrective actions related to response activities were identified during this meeting, and there is evidence that some actions were completed. However, the meeting was not documented, lessons learned were not recorded, and corrective actions are not being tracked by NCRs as required by the plant standard.

Generally, issues management and corrective action tracking programs are not being used effectively to track issues, assign corrective actions, report progress, and verify closure. For example:

- As mentioned in previous sections, some corrective actions implemented in response to the August 2000 OA exercise evaluation have not been effective. These include changes in the on-scene commander checklist that were negated because the checklist has not been updated in accordance with the new on-scene command policy; training/drills for on-scene commanders that was not consistent with new policy; and many EAL indicators that remain ambiguous or that cannot be observed.

- There are 23 overdue findings from internal BWXT exercise/drill evaluations conducted in FY 1999 and 2000. The backlog of overdue corrective actions has trended downward; however, this appears to be due to a combination of focused but short-lived efforts to close issues and the identification of only four new issues over the past two years.

- Information in the consolidated findings report is not readily retrievable, and because its use is discretionary, the report is not being used to track issues identified by the drill program.

- A lack of rigor in reporting findings at a threshold that requires tracking has resulted in few issues that are processed in accordance with the applicable procedure.

- The use of numerous and structurally diverse tracking systems hampers the ability to identify performance trends and common causes for weaknesses.

Issues management and corrective action tracking programs are fragmented and not used effectively to capture and track issues, assign corrective actions, report progress, and verify closure as required by DOE Order 151.1A and the Emergency Management Mission Support S/RID. These problems in emergency management are not unique. They are indicative of broader weaknesses in integrated safety management reflected in the Pantex feedback and improvement program. Volume I of this report addresses this area in more detail.

In conclusion, the BWXT self-assessment program for emergency management includes provisions for planning, reporting, developing corrective actions, and verifying corrective action completion. This program is supplemented by Quality Assurance Division independent assessments. Program enhancements have also been identified and are being implemented outside of any formal assessment program. However, the emergency management self-assessment program does not meet either BWXT requirements or DOE/NNSA expectations in terms of frequency, scope, or rigor. Weaknesses identified by external and internal assessments have not been consistently identified and corrected. Additionally, the use of different tracking systems for findings originating from exercise/drills, self-assessments, Quality Assurance Division assessments, and baseline needs assessment issues hinders the identification of performance trends and recurring problems.

F.3 CONCLUSIONS

OASO, supported by TEOD, has conducted a variety of activities to monitor the performance of Pantex Plant emergency management program. BWXT has identified and implemented some significant program enhancements. However, OASO has not conducted performance monitoring activities that would identify programmatic weaknesses, and there is no established program for conducting thorough assessments of the emergency management program. Additionally, the emergency management self-assessment program does not meet either BWXT requirements or DOE/NNSA expectations in terms of frequency, scope, or rigor. Weaknesses identified by external and internal assessments have not been consistently identified and corrected, and the use of various tracking systems hinders the identification of performance trends and recurring problems.

F.4 RATING

A rating of NEEDS IMPROVEMENT is assigned to the area of NNSA assessments and performance monitoring.

A rating of NEEDS IMPROVEMENT is assigned to the area of contractor assessments and issues management.

F.5 OPPORTUNITIES FOR IMPROVEMENT

This Independent Oversight review identified the following opportunities for improvement; Volume I of this report also identifies improvement items related to continuous improvement processes. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and

evaluated by the responsible DOE/NNSA and contractor line management and prioritized and modified as appropriate, in accordance with site-specific programmatic emergency management objectives.

Office of Amarillo Site Operations

- Ensure that emergency management is clearly identified as a core function in the performance evaluation plan objective.

- Consider enhancing the oversight program by implementing the following improvements.

  - When delays are anticipated in producing a final report, formally transmit draft versions of assessments in order to minimize loss of momentum in resolving and addressing areas of weakness or improvement items.

  - When transmitting reports, clearly convey OASO's expectations regarding contractor actions to address identified weaknesses or improvement items.

  - Establish protocols for conducting document reviews and for formally communicating the results of emergency management operational awareness activities to BWXT.

  - In developing a plan and schedule for assessing all elements of the site's emergency management program at least once every three years, identify the areas and sources of expertise needed to support the assessment plan. Consider technical support from other DOE/NNSA sites.

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- Improve the documentation of self-assessment results to aid in trending and identification of recurring weaknesses.

  - Include positive as well as negative results in emergency management assessment reports for all elements that are evaluated in order to more thoroughly document the assessment scope and facilitate recognizing and evaluating performance trends.

  - Consider attaching completed checklists to the official file copy of the self-assessment report.

  - Reinforce the importance of accurately characterizing discrepancies and recommendations in the self-assessment reports.

- Consolidate the various tracking systems used for emergency management improvement items and recommendations into one database to facilitate data retrieval.

  - Develop a department-level database structured to capture and document the resolution of issues that require an NCR. Include fields to facilitate reporting by performance objective and document closure evidence (e.g., procedure revision) and verification activities, as required.

  - Establish a department-level protocol for tracking, closing, and verifying the effectiveness of actions taken to address emergency management improvement items and recommendations. Emphasis should be placed on minimizing the administrative burden associated with the system, while providing information in a readily retrievable format. For example, formal corrective

action plans and hardcopy evidence files may not be necessary for improvement items and recommendations if the tracking system provides a trail of each item's resolution.

- Include items from drills, exercises, and self-assessments that do not require NCRs.

- Use this database in the drill, exercise, and self-assessment planning processes to ensure that issues are adequately resolved.