

**Independent Oversight
Inspection of
Emergency Management
at the**



Pantex Site Office and the Pantex Plant

June 2008

Office of Emergency Management Oversight
Office of Independent Oversight
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Table of Contents

Abbreviations	i
1.0 Introduction	1
2.0 Results	3
3.0 Conclusions	6
4.0 Ratings	8
Appendix A – Supplemental Information	11
Appendix B – Site-Specific Findings	12
Appendix C – Emergency Planning	13
Appendix D – Emergency Preparedness	21
Appendix E – Emergency Response	29
Appendix F – Readiness Assurance	35

Abbreviations Used in This Report

ALOHA	<i>Areal Locations of Hazardous Atmospheres</i>
B&W Pantex	<i>Babcock & Wilcox Pantex, L.L.C.</i>
CAT	<i>Consequence Assessment Team</i>
DOE	<i>U.S. Department of Energy</i>
EAL	<i>Emergency Action Level</i>
EM	<i>Emergency Manager</i>
EMD	<i>Emergency Management Department</i>
EOC	<i>Emergency Operations Center</i>
EOM	<i>Emergency Oversight Manager</i>
EPC	<i>Emergency Press Center</i>
EPHA	<i>Emergency Planning Hazards Assessment</i>
EPI	<i>Emergency Public Information</i>
EPIcode	<i>Emergency Prediction Information Code</i>
ERO	<i>Emergency Response Organization</i>
FY	<i>Fiscal Year</i>
HS-63	<i>Office of Emergency Management Oversight</i>
IC	<i>Incident Commander</i>
ICG	<i>Incident Command Group</i>
ICS	<i>Incident Command System</i>
JIC	<i>Joint Information Center</i>
LSPT	<i>Limited-Scope Performance Test</i>
MD&C	<i>B&W Pantex Management and Business Communications Department</i>
NA-43	<i>NNSA Office of Emergency Management Implementation</i>
NNSA	<i>National Nuclear Security Administration</i>
PSS	<i>Plant Shift Superintendent</i>
PXSO	<i>Pantex Site Office</i>
WFNA	<i>White Fuming Nitric Acid</i>

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1 Introduction

The U.S. Department of Energy (DOE) Office of Independent Oversight inspected the emergency management program at DOE's Pantex Plant in March-April 2008. The inspection was performed by Independent Oversight's Office of Emergency Management Oversight (HS-63). Independent Oversight reports to the Chief Health, Safety and Security Officer, who reports directly to the Secretary of Energy.

Within DOE, the National Nuclear Security Administration (NNSA) Office of the Deputy Administrator for Defense Programs is the cognizant secretarial office for the Pantex Plant. As such, it has overall Headquarters responsibility for programmatic direction and funding of most activities at the site. The NNSA Office of Defense Programs, in coordination with the Office of Emergency Management Implementation (NA-43), has specific line management responsibility at the Headquarters level for the site's emergency management program. At the site level, the NNSA Pantex Site Office (PXSO) has line management responsibility for Pantex operations and security. The Pantex Plant is managed and operated by Babcock & Wilcox Pantex, L.L.C. (B&W Pantex), under contract to NNSA.

The primary mission of the Pantex Plant is the assembly, disassembly, testing, and evaluation of nuclear weapons in support of DOE'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. Activities at the Pantex Plant involve various forms of radiological and chemical hazardous materials that are present in significant quantities and that need to be effectively controlled. The Pantex Plant is located in the Texas Panhandle, approximately 17 miles northeast of Amarillo. The site encompasses approximately 9,000 acres of 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.

The purpose of this Independent Oversight inspection was to assess the effectiveness of the emergency management program at the Pantex Plant, as implemented by B&W Pantex under the direction of PXSO. This evaluation included an examination of selected elements of the emergency management program. Independent Oversight used a selective sampling approach to assess a representative sample of facilities and emergency responders at Pantex. Specifically, the sampling approach was used to evaluate:

- The effectiveness of the hazards survey and emergency planning hazards assessment (EPHA) in serving as an appropriate foundation for the Pantex emergency management program.
- The effectiveness of the PXSO and B&W Pantex emergency response organization (ERO) personnel in applying their skills, procedures, and training to make appropriate decisions and to properly execute actions to protect emergency responders, workers, and the public. To evaluate response

performance, Independent Oversight conducted limited-scope performance tests (LSPTs) for initial responders and decision-makers. The performance tests were designed to evaluate the ability of responders to effectively execute their assigned duties during postulated site-specific emergencies. Independent Oversight used trusted agents from the site to assist in developing and conducting the performance test scenarios and validating the results.

These activities, as well as reviews of corrective actions in other assessment areas developed in response to self-identified weaknesses and areas for improvement, provided insights into the effectiveness of PXSO and contractor feedback and continuous improvement systems, as well as NNSA's emergency management oversight and operational awareness activities at Pantex.

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 Independent Oversight's conclusions regarding the overall effectiveness of PXSO and contractor management of the emergency management program. Section 4 presents the ratings assigned as a result of this inspection. Appendix A provides supplemental information, including team composition. Appendix B identifies the findings that require corrective action and follow-up. Appendices C through F detail the results of the reviews of individual emergency management program elements.

2

Results

2.1 Positive Program Attributes

PXSO and B&W Pantex have made noteworthy progress over the past three years in implementing an emergency management program that facilitates effective response to a wide range of potential initiating events. Positive attributes of the emergency management program are discussed below.

The Pantex training, drill, and exercise programs develop and maintain emergency response capabilities to ensure that personnel are prepared to respond to emergencies. Training, drill, and exercise requirements are well defined and implemented in accordance with the Pantex emergency plan, training and drill program plan, and exercise program plan. Training and drill curricula, based on a needs analysis, are appropriate, comprehensive, approved, and up to date. The shift in emphasis from computer-based training to classroom instruction by qualified instructors is noteworthy. The exercise program tests and validates response program elements over a five-year period using specific objectives keyed to the emergency plan and implementing procedures. Pantex provides offsite authorities training and information on the Pantex emergency management program through a variety of methods including drills, exercises, local emergency planning committee meetings, and the public information program.

Key emergency response decision-makers performed effectively during LSPTs. Operational emergencies were promptly recognized by the plant shift superintendent (PSS), and the emergency operations center (EOC) cadre and appropriate response teams were activated, including the incident command group. The PSS notified workers of initial shelter-in-place protective actions and provided adequate instructions for the safe routing of the ERO to their emergency duty stations, such as the EOC. Initial offsite notifications and pre-approved news releases were timely and accurate. Incident commanders led a coordinated and effective response to security and operational events involving hazardous materials. Emergency managers and emergency oversight managers used the applicable emergency action levels (EALs) to correctly categorize and classify the events and formulate protective actions. Hazardous materials were identified and characterized to facilitate consequence assessments at the EOC. Consequence assessment tools were available and consequence assessment teams demonstrated proficiency in their use. Overall, response activities were generally well coordinated and comprehensive.

The Pantex emergency plan, along with supporting plans and work instructions, establishes clear roles and responsibilities for response activities and program administration. The emergency plan, supported by several subordinate plans, thoroughly addresses programmatic elements and provides a sound concept of operations. Work instructions, manuals, checklists, and supporting tools provide the PSS, incident command group, and EOC staff with adequate instructions and tools for performing categorization,

classification, protective actions, and notifications, although weaknesses were noted in accountability and shelter-in-place implementing documents. Fire department actions are generally well defined in a set of fire department guidelines. The emergency public information (EPI) program plan includes adequate provisions for both a media center, for use before a joint information center (JIC) is necessary, and a JIC where multiple jurisdictions gather, process, and disseminate public information during an emergency.

Emergency management feedback and improvement processes by PXSO and B&W Pantex are mostly effective in identifying and implementing needed program improvements. PXSO is actively engaged in maintaining operational awareness of the Pantex emergency management program through regular interactions with program personnel, contractor assessments (and some self-assessments), and performance measures. B&W Pantex has defined and implemented comprehensive processes for conducting annual assessments of the emergency management program and managing issues identified by assessments and exercises. B&W Pantex is effectively using these processes to identify areas that require attention and to improve the site's emergency management program.

2.2 Program Weaknesses and Items Requiring Attention

The Pantex emergency management program has improved since the previous Independent Oversight inspection and the ERO has demonstrated effective decision-making; however, additional work remains, particularly in the area of the EPHA. Specific weaknesses are discussed below.

The lack of effective update mechanisms and errors in the analyses performed for aqueous chemical releases have significantly underestimated consequences for many chemical release scenarios. A sitewide mechanism to ensure that the EPHA is updated in a timely manner to reflect significant changes in hazardous chemical inventories is in development but has not been fully implemented. The inspection team identified two chemicals of concern that had not been included for hazards screening, as well as some chemicals where actual quantities significantly exceeded those analyzed in the EPHA. Additionally, the consequences for aqueous chemical releases were significantly underestimated in the EPHA analyses due to data input errors. In one case, data entry errors, made by an external contractor, resulted in calculated chemical source terms that were several orders of magnitude too low. In another case, only a single container quantity was input and analyzed, rather than the total quantity of multiple containers stored in a single location. The conservatism in the EALs and predetermined protective actions partially mitigate these errors for releases that are not projected beyond the site boundary. However, predetermined protective action recommendations (for offsite authorities) do not appropriately reflect the impact of potential hazardous material releases on the public.

Although emergency plans and procedures are generally comprehensive, several weaknesses in roles, responsibilities, and processes were identified. Site personnel are instructed to shelter in place, as the initial, default protective action; however, plans, work instructions, and pre-scripted public address announcements provide only generic instructions for personnel to secure air handling units in the buildings where possible. Roles, responsibilities, and the specific actions required to secure air handling units have not been addressed for many facilities. Similarly, mechanisms for conducting personnel accountability following building evacuation are not fully developed. Additionally, PXSO and B&W Pantex have not adequately documented EPI processes for the approval of news releases, involvement in site worker announcements, rumor control, and coordination of JIC activation.

During LSPTs, emergency response functions were generally well coordinated; however, communications among the incident command group, PSS, and EOC were not always effective. Although the ERO

demonstrated efficient teamwork in performing their emergency response duties, communications were not consistently effective throughout the response. The PSS did not maintain event logs or provide information for WebEOC entries and did not adequately record events and response actions for EPI tasks and decision-making in the EOC. The PSS encountered problems establishing and maintaining the incident command phone bridge, which delayed the transmittal of event scene information. In one instance, an update offsite notification form was not prepared by the PSS or EOC following a postulated hazardous material release and a change to onsite protective actions, as required. Additionally, the emergency press center did not facilitate site worker public announcements to aid the PSS, despite several requests for support. There were also two instances where the consequence assessment team miscommunicated units of measure on dispersion plots.

3

Conclusions

Independent Oversight's previous inspection of emergency management at Pantex, conducted in August 2005, concluded that the emergency management program as a whole provided confidence that site workers and the public would be adequately protected should an emergency occur at the Pantex Plant, but also identified weaknesses in some program elements. This 2008 Independent Oversight inspection found significant improvements in the functional elements evaluated and, PXSO and B&W Pantex have, for the most part, adequately addressed previously identified weaknesses. However, this inspection also identified areas where further improvements are needed, most significantly in the EPHA analyses for aqueous chemicals and mechanisms to ensure the EPHA is updated for changes in hazardous chemical inventories.

B&W Pantex training, drills, and exercise programs have been significantly improved to better prepare ERO members to perform their assigned emergency response functions. Effective processes ensure all ERO members demonstrate their knowledge and skills and receive training on significant changes to procedures. Controls are in place to ensure that B&W Pantex personnel on the ERO roster have met initial and annual refresher training requirements. Additionally, B&W Pantex has made further program improvements by acquiring a training coordinator with substantial instructional experience and replacing many computer-based training courses with a more appropriate classroom setting. The use of an ERO training requirements matrix and a database ensures that only appropriately trained personnel are on the ERO duty roster. The exercise program is well defined by plans and procedures and includes the essential mechanisms for planning, conducting, evaluating performance, reporting exercise results, and managing corrective actions.

Additionally, the B&W Pantex self-assessment and issues management processes are substantially improved, resulting in the timely identification and correction of program weaknesses. The Pantex emergency plan and the supporting plans, work instructions, and checklists delineate the organizational roles and responsibilities for the programmatic elements and adequately describe the concept of operations for emergency response. The EPI program contains many positive attributes, including a knowledgeable management team and an extensive public education component. During LSPTs, overall response activities were generally well coordinated and comprehensive. The incident commanders' and the consequence assessment teams' performance were noted as strengths.

Nevertheless, some program weaknesses were noted. Most significantly, mechanisms in place do not properly ensure that changes in hazardous chemical inventories are adequately reviewed against EPHA analyses and chemical consequence assessment analyses contained inaccuracies. Actual quantities of some chemicals currently in use significantly exceed those identified in the hazards survey, conducted in 2006. Additionally, the analyses performed for the aqueous chemical spill releases are inconsistent and inaccurate as a result of data input errors in calculations performed and quantities of chemicals analyzed. In response

to this issue, B&W Pantex took immediate steps to prepare conservative temporary EALs to ensure the predetermined protective action recommendations (for offsite authorities) appropriately reflect the potential impact of hazardous material releases. This compensatory measure is appropriate until re-analyses can be completed and more chemical-specific EALs can be developed.

The Independent Oversight team also identified several program areas that have not been thoroughly planned and tested. Sheltering site workers in place is the default initial protective action for hazardous material releases but the roles, responsibilities, and required actions for securing ventilation to reduce the influx of hazardous materials have not been identified for many facilities. Similarly, personnel accountability is not adequately addressed in plans and procedures and not evaluated during building evacuation drills. Additionally, the EPI program plans and checklists do not consistently describe the processes and methods for the approval of news releases, worker notifications, rumor control, and JIC activation. Other areas identified that require further improvements include communications among response elements during an emergency, and the tracking of training requirements for PXSO ERO members to ensure that only fully trained personnel are added to the roster.

Overall, the concepts for emergency operations at Pantex are generally well documented and implemented by an appropriately trained and knowledgeable response organization, resulting in a cohesive response to operational emergencies. However, PXSO and B&W Pantex contractor line management attention is warranted to ensure that the necessary decision-making tools—most importantly EALs—are based on actual or allowable chemical inventories and accurate analyses.

4 Ratings

This inspection focused on an assessment of six key emergency management programmatic elements, as well as the performance of primary emergency response decision-makers and support functions during LSPTs. No overall program rating has been assigned. The individual element ratings reflect the status of each Pantex Plant emergency management program element at the time of the inspection. The rating assigned below to the readiness assurance category is specific to those assessment, corrective action, and performance monitoring mechanisms applicable to the emergency management area.

The ratings for the emergency management elements evaluated during this inspection are:

EMERGENCY PLANNING	
Hazards Survey and Hazards Assessment	Needs Improvement
Program Plans and Procedures	Effective Performance

EMERGENCY PREPAREDNESS	
Training, Drills, and Exercises	Effective Performance
Emergency Public Information	Effective Performance

EMERGENCY RESPONSE	
Plant Shift Superintendents	Effective Performance
Incident Command Staffs	Effective Performance
Emergency Operations Center Teams	Effective Performance
Consequence Assessment	Effective Performance

READINESS ASSURANCE	
NNSA Line Program Management	Effective Performance
B&W Pantex Feedback and Improvement	Effective Performance

Ratings Definitions

Independent Oversight uses a three-tier rating system that is intended to provide line management with a tool for determining where resources might be applied toward improving the site's emergency management program. This, and the fact that these reviews use a sampling technique to evaluate program elements, is

the primary reason why the Office of Emergency Management Oversight assigns ratings to the supporting elements of a facility's emergency management program rather than providing an overall rating. The ratings are not intended to provide a relative ranking of programs at different sites because of the many differences in missions, hazards, and facility life cycles. The rating system helps to communicate performance information quickly and simply. Changes in rating colors from previous reviews can be used to recognize relative improvements or to identify deteriorating performance. The three ratings and the associated management responses are:

- **Effective Performance (Green):** An emergency management element being evaluated would normally be rated "Effective Performance" if the emergency management function is effectively implemented. An element would also normally be rated as "Effective Performance" if, for any applicable standards that are not met, other compensatory factors exist that provide equivalent protection to workers and the public, or the impact is minimal and would not significantly degrade the site's response to an emergency. There may be specific issues or deficiencies that require attention and resolution.
- **Needs Improvement (Yellow):** An emergency management element being evaluated would normally be rated "Needs Improvement" if one or more applicable standards are not met, the variances are only partially compensated for by other measures, and the resulting deficiencies in the emergency management function degrade the ability of the emergency responders to protect site workers and the public. Line managers would be expected to substantially increase their attention on the identified areas of weakness. This rating is anticipatory and provides an opportunity for line management to correct and improve performance before it results in a meaningful degradation in the ability of emergency responders to protect site workers and the public.
- **Significant Weakness (Red):** An emergency management element being evaluated would normally be rated "Significant Weakness" if one or more applicable standards are not met, there are no compensating factors, and the resulting deficiencies in the emergency management function seriously degrade the ability of the emergency responders to protect site workers and the public. Line managers would be expected to apply immediate attention, focus, and resources to the deficient program areas, and in most cases, compensatory measures would be appropriate.

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APPENDIX A

Supplemental Information

A.1 Dates of Review

Planning Visit	March 11 – 13, 2008
Onsite Inspection Visit	March 24 – April 2, 2008
Report Validation and Closeout	April 29 – 30, 2008

A.2 Review Team Composition

A.2.1 Management

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Michael A. Kilpatrick, Deputy Chief for Operations, Office of Health, Safety and Security
Bradley A. Peterson, Director, Office of Independent Oversight
Steven C. Simonson, Director, Office of Emergency Management Oversight

A.2.2 Quality Review Board

Michael A. Kilpatrick
Bradley A. Peterson
Steven C. Simonson
Dean C. Hickman
Robert M. Nelson
William T. Sanders

A.2.3 Review Team

Jeffrey Robertson (Team Leader)
John Bolling
JR Dillenback
Deborah Johnson
Teri Lachman
David Odland
Thomas Rogers

APPENDIX B

Site-Specific Findings

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

FINDING STATEMENTS	REFER TO PAGES:
1. B&W Pantex processes for acquiring and controlling hazardous chemical materials do not ensure that the site EPHA appropriately reflects the impact of potential hazardous chemical releases on site workers and the public, as required by the B&W Pantex work instructions and DOE Order 151.1C, <i>Comprehensive Emergency Management System</i> .	14
2. B&W Pantex did not accurately analyze aqueous chemicals in the EPHA, as required by DOE Order 151.1C.	15
3. B&W Pantex emergency response procedures do not comprehensively address personnel sheltering and accountability during an emergency, as required by DOE Order 151.1C.	19
4. PXSO and B&W Pantex do not adequately document emergency public information processes and checklists for the approval of news releases, methodology for informing workers, provision of rumor control, and coordination of JIC activation, as required by their EPI Program Plan and DOE Order 151.1C.	26
5. During LSPTs, emergency responders did not maintain effective communications among event scene responders, emergency managers, and response facilities, as required by DOE Order 151.1C and the Pantex Emergency Plan.	31
6. The PXSO does not ensure that their ERO members have completed all training requirements and are capable of fulfilling their assigned response functions before assignment to the ERO roster, as required by DOE Order 151.1C.	37

APPENDIX C

Emergency Planning

C.1 INTRODUCTION

Key elements of emergency planning include the development of a hazards survey and emergency planning hazards assessment (EPHA) to identify and assess the impact of site- and facility-specific hazards and threats, and the establishment of an emergency planning zone. U.S. Department of Energy (DOE) and National Nuclear Security Administration (NNSA) sites and facilities use the results of these assessments to establish emergency management programs that are commensurate with the identified hazards. The site emergency 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, irrespective of its magnitude. These plans and procedures must be closely coordinated and integrated with offsite authorities that support the response effort and receive DOE emergency response recommendations.

This evaluation included a review of the Babcock & Wilcox Pantex, L.L.C. (B&W Pantex) hazards survey and EPHA, and their treatment of hazards associated with the Pantex Plant. Independent Oversight also reviewed the sitewide and facility-specific emergency plans and associated implementing procedures.

C.2 STATUS AND RESULTS

C.2.1 Hazards Survey and Hazards Assessment

The August 2005 inspection determined that B&W Pantex had implemented formal processes for developing the hazards survey and EPHA that produced stand-alone documents that address the appropriate elements. The EPHA analyses and results were clearly presented in a well-organized document, which facilitated review and update. However, inconsistencies between the hazards survey development procedure and B&W Pantex's actual practices in screening hazardous chemicals did not ensure that all hazardous chemicals were appropriately assessed. This 2008 Independent Oversight inspection found that B&W Pantex has resolved some of the issues identified during the August 2005 inspection; however, weaknesses exist in the implementation of a hazardous material inventory control process and the accuracy of chemical consequence assessment analyses.

The B&W Pantex Emergency Management Department (EMD) has developed comprehensive work instructions for preparing the hazards survey and EPHA that identify requirements and expectations in DOE Order 151.1C and the associated DOE Emergency Management Guide. The work instructions provide site-specific references that reflect the DOE Emergency Management Guide, provide a good basis for preparing the hazards survey and EPHA, and ensure development of a technically-based site emergency planning zone. The hazards survey and EPHA were revised in 2006 to implement the provisions of DOE Order 151.1C and meet Departmental expectations regarding methodology and level of detail. These documents are consistent with the defined B&W Pantex work instructions and include such appropriate elements as descriptions of emergency events and conditions; external hazards (for example, transportation accidents,

and the impact of events at nearby, offsite hazardous material facilities); and onsite temporary/transitory hazards that have the potential to affect hazardous material facilities. The EPHA considers a wide range of accident scenarios; identifies dose receptors of interest for each facility; and estimates plume arrival times at the receptors of interest.

An effective hazardous material identification and screening process, which establishes the need for a quantitative EPHA, is based on a thorough identification of the hazardous materials present in the facility, which in turn relies to a great extent on an accurate site inventory of hazardous materials and appropriate screening thresholds. B&W Pantex has established and maintains a maximum limit list for radiological materials that contains the maximum operating inventories for the various facilities. The EPHA developer compared the materials in the maximum limit list to the DOE-STD-1027-92 threshold limits and the materials that exceeded the thresholds were included in the EPHA. To ensure the EPHA continues to reflect maximum radiological inventories, the Authorization Basis Department notifies the EPHA developer of changes to the authorization basis documents; positive unreviewed safety questions, which require a safety evaluation report; and hazard control evaluations requiring a change to the process safety analysis.

For hazardous chemicals, B&W Pantex implemented a screening process that uses the criteria described in DOE Order 151.1C. However, a mechanism to identify significant changes in chemical material inventories has not been fully implemented. This issue was previously identified and a corrective action was well underway in 2005 (to modify the integrated hazardous materials information system so that it would identify hazardous materials throughout the site that exceed an identified screening threshold quantity set by EMD). Implementation of this initiative could not be achieved due to limitations later identified in the chemical management system software. The EPHA developer can query the system and develop a report of chemical inventories throughout the plant, but this requires a search for changes rather than an advanced notification that changes will occur. To address this shortcoming, the EPHA developer used established ceiling (maximum quantity) limits for toxic inhalation hazard chemicals that are approved for use and listed in the chemical database program. Procurement controls prevent chemical quantities from exceeding ceiling limits. Furthermore, the EPHA developer and the Hazard Communication Section are currently working to institute similar controls for a list of hazardous materials of concern that contains conservative planning quantities for hazardous chemicals without a toxic inhalation hazard ceiling limit. However, at the time of this inspection, this initiative had not been fully implemented.

To evaluate the effectiveness of the hazards identification process, Independent Oversight conducted walkdowns of multiple facilities, including chemical processing facilities, with facility managers and the EPHA developer. Actual facility hazardous material inventories were compared to the EPHA and current facility hazardous material lists. These walkdowns confirmed that the radiological materials are maintained per the maximum limit list and the current chemical material lists were accurate. However, the actual quantities of some chemicals at facilities significantly exceed those analyzed in the EPHA. For example, the hazards survey and EPHA indicate a quantity of 761 pounds of toluene and 76 pounds of sulfuric acid at one facility, but, according to the current chemical material list, inventories of these materials are greater than 2000 pounds and 800 pounds, respectively. In addition, two chemicals with health hazard ratings of 3 – cyclohexanone and dimethylformamide – were identified, and should not have been screened out, but were not included in the hazards survey or EPHA at two facilities.

Finding #1: B&W Pantex processes for acquiring and controlling hazardous chemical materials do not ensure that the site EPHA appropriately reflects the impact of potential hazardous chemical releases on site workers and the public, as required by the B&W Pantex work instructions and DOE Order 151.1C, *Comprehensive Emergency Management System*.

An additional weakness was identified in the technical accuracy of the chemical consequence assessment analyses in the EPHA. Independent Oversight sampled the consequence analyses using the modeling criteria identified in the EPHA. These analyses confirmed the accuracy of the results pertaining to the radiological hazardous materials and most chemical releases. However, the analyses performed for some of the aqueous chemical spill releases were determined to be in error as a result of data input errors in calculations performed, and/or quantities of chemicals analyzed, as discussed below.

The EMD hired an external contractor to perform the chemical consequence assessment modeling to expedite the revision of the EPHA in a timely manner to meet DOE Order 151.1C requirements. The external contractor used a unique in-house puddle evaporation rate algorithm to obtain a respirable release fraction for each chemical. However, these release fractions were not consistent for the same chemical at different locations. For example, the respirable release fraction for white fuming nitric acid (WFNA) used for one facility was approximately six orders of magnitude less than that used for another facility. Consequently, the source term derivation for the facilities using the lesser release fraction was negligible and did not produce a classifiable emergency for 500 pounds of WFNA, but the source term derivation using the greater release fraction produced a site area emergency classification for 45 pounds of WFNA. Independent analyses, using the Areal Locations of Hazardous Atmospheres (ALOHA) and the Emergency Prediction Information Code (EPIcode) models were performed, assuming a spill release of 500 pounds of WFNA and allowing the models to run their own evaporation rate algorithm. The output results indicate that the protective action criteria are exceeded out to a distance of 170 meters using ALOHA and 200 meters using EPIcode (site area emergency classifications).

Additionally, the chemical consequence analyses contained in the EPHA only consider a single container quantity, not the total quantity of multiple containers stored in a single location, as required. In one instance, 46 pounds of acetic acid was analyzed, but the actual quantity stored together at the location is approximately 4200 pounds. The results of consequence analyses using single container quantities do not exceed protective action criteria values for the majority of chemical releases, and therefore are not classifiable events. However, performing consequence analyses, using the total quantity of a chemical material in a single location, will likely result in classifiable events.

Finding #2: B&W Pantex did not accurately analyze aqueous chemicals in the EPHA, as required by DOE Order 151.1C.

A mitigating feature to these non-conservative consequence assessments is the fact that all chemical release events (except incidental spills) at Pantex are categorized, at a minimum, as operational emergencies, not further classified. Because of the conservatism in the emergency action levels (EALs) and predetermined protective actions, the protective actions for an operational emergency (not further classified) are the same as those for a chemical release classified as an Alert and Site Area Emergency. However, it is likely that analyses corrected for appropriate release fractions and chemical quantities will result in General Emergencies for several chemical release scenarios. In response to this issue, B&W Pantex immediately developed, and issued for review and approval, temporary EALs to ensure the predetermined protective action recommendations (for offsite authorities) appropriately reflect the impact of potential hazardous material releases on the public. These EALs provide an appropriate and timely compensatory measure until re-analyses can be completed, the EPHA revised, and more chemical-specific EALs can be developed.

To summarize, B&W Pantex has developed work instructions for preparing the hazards survey and EPHA to help ensure the documents reflect the DOE Emergency Management Guide and establish an appropriate

foundation for the B&W Pantex emergency management program. The hazards survey and EPHA were revised in accordance with these work instructions in 2006 to implement DOE Order 151.1C, and these documents meet DOE's expectations regarding methodology and level of detail. The EPHA considers a wide range of accident scenarios; identifies dose receptors of interest for each facility; and estimates plume arrival times at the receptors of interest. Although B&W Pantex has implemented an effective process for maintaining the hazards survey and EPHA by ensuring the EPHA developer receives notification prior to changes in hazardous radiological material inventories, an effective process has not been implemented for changes in hazardous chemical material inventories. In addition, technical inaccuracies and inconsistencies exist in the chemical consequence assessment analyses due to data input errors and use of single container quantities of materials analyzed. The impact of these weaknesses is that emergency responders may not possess all of the required response planning tools necessary to effectively respond to an emergency event involving the release of hazardous materials. However, temporary EALs and conservative protective actions were developed as a compensatory measure to ensure the tools are available until the EPHA is revised and chemical-specific EALs are developed.

C.2.2 Program Plans and Procedures

The August 2005 inspection determined that the emergency plan, implementing procedures, and operator aids, and the extensive efforts taken to revamp the EALs, had produced a solid procedural foundation for responding to and managing an emergency. However, some concerns related to communications with offsite authorities, offsite protective action recommendations, and onsite protective actions (as well as some inconsistencies among procedures) were identified. This 2008 Independent Oversight inspection found that, since the previous inspection, B&W Pantex has incorporated its emergency management documents into the site's well-designed document control process and completed an extensive revision of its plans, implementing instructions, and supporting documents; consequently, the site's emergency management program and integrated response have a strong foundation. However, the processes for shelter-in-place and personnel accountability are not fully and consistently documented.

The Pantex Plant Hazardous Material Program Emergency Plan and the supporting plans and work instructions establish a comprehensive emergency management program. The emergency plan delineates the organizational roles and responsibilities for the programmatic elements and adequately describes the concept of operations for emergency response. The emergency plan is supported by several subordinate plans that address the programmatic elements (for example, training and drills, exercises, emergency public information, and readiness assurance), which are implemented through a detailed set of work instructions. The emergency response organization includes an incident command group (ICG) to manage the response at the event scene, a continuously manned operations center to provide initial sitewide response, and an emergency operations center (EOC) cadre with responsibility for sitewide response following activation. The emergency plan defines roles and responsibilities for both initial response and actions following activation of the EOC, and addresses the roles and responsibilities of Pantex Site Office (PXSO) personnel for oversight and response. Work instructions provide further detail about roles, responsibilities, and actions for individual processes.

Plans and supporting documents are included in B&W Pantex's comprehensive document control system that ensures approved work instructions, checklists, and supporting tools are available (although uncontrolled revisions of two PXSO checklists were used during the limited-scope performance tests). The roles, responsibilities, and concepts of emergency operations are, with a few exceptions, consistent among plans, work instructions, and checklists.

A checklist supports operation of the ICG, and fire department actions are well defined in a set of guidelines. Work instructions and checklists adequately address the establishment of an incident or unified command structure and an incident command post. The ICG is typically headed by an incident commander from the fire department (fire and safety events) or security department (security events), whose responsibilities to manage activities at the scene are generally well defined. Fire department guides adequately address the response to fire, chemical, and medical events, including organizational structures commensurate with the size and complexity of the event. Although the checklists and guides provide a satisfactory framework for the overall operation of the ICG, some inconsistencies in the implementing documents were observed. For example, as demonstrated during the limited-scope performance tests, the radiation services department supervisor may act as the incident commander for some radiological events, although the emergency plan, work instructions, and checklist do not address this ICG organization. Also, the work instruction for planning, coordinating, and accomplishing reentry specifies that the incident commander plans and emergency manager (EM) approves reentry; however, the ICG checklist does not include information on reentry responsibilities, and the fire department guides allow reentry for life saving or rescue activities. Finally, the reentry work instruction indicates that the EM approves exceeding personnel radiation exposure limits, but fire department guides address/authorize exceeding limits during the response (without EM approval), and the ICG checklist does not include authorization or implementation processes for exceeding exposure limits.

Overall, operations center personnel have adequate plans, instructions, and tools for performing categorization, classification, protective actions, and notifications, both on site and off site. Operations center checklists and desk aids support response to abnormal and emergency events and branch to the EAL manual for evaluation of the category and classification of the event or to the operations center emergency response checklist. The EAL manual provides flowcharts to determine categorization and classification, and includes guides that specify public address announcements, protective actions, notifications, and emergency response organization activation. The protective action and warning system plan provides information on the available protective actions and the systems for communicating these actions, which are carried over into the work instructions, checklists, and desk aids. Work instructions provide details about processes for determining and communicating category, classification, and protective actions and performing notifications for emergencies; checklists, desk aids, and other tools adequately support implementation. The site has agreements and memoranda of understanding in place with local officials and agencies that allow site personnel to perform the initial public warnings for events that may affect the offsite population. These agreements are appropriately implemented through the protective action warning system and notification processes.

Response activities in the EOC are split between an emergency management team (B&W Pantex), whose responsibilities include strategic direction of the response, support to the ICG, protective actions, and communication with offsite jurisdictions, and the PXS0 emergency oversight and assistance team, whose responsibilities include offsite agency interface and communication with the public. Implementation of these responsibilities is supported by a suitable set of work instructions, checklists, and forms. Most important EM and emergency oversight manager tasks are addressed in implementing checklists, and a comprehensive set of checklists and supporting documents is provided for EOC support personnel from both B&W Pantex and PXS0.

Although mostly satisfactory, some documents used by the plant shift superintendent (PSS) and EM lack necessary information. For example, the EAL manual does not directly address classification and protective actions for emergencies involving suspicious packages based on proximity to hazardous materials, and work instructions do not address explosive standoff distances. In addition, the notification form instructions do

not require all the information specified in DOE Order 151.1C be included in the initial notification, and do not address EM and emergency oversight manager approvals of notifications following EOC activation, as specified in their implementing checklists.

Although the emergency plan and implementing documents address shelter-in-place and accountability, several weaknesses and inconsistencies in the roles, responsibilities, and procedures for these activities were identified. Shelter-in-place is the default, sitewide protective action ordered by the PSS or EM for most hazardous material releases at the site. Plans and work instructions provide generic instructions for personnel to secure air handling units in the buildings during shelter-in-place, and pre-scripted public address announcements in the EAL guides direct that ventilation be shut down “where possible.” The work instruction for implementing protective actions specifies that facility representatives or building managers are responsible for securing ventilation. In addition, utility services personnel are capable of securing the air handling units in a number of buildings and could support the shutdown of units (operated externally) in several zones. An additional work instruction also provides some direction for emergency shutdown of utility and/or facility systems (though not specifically for shelter-in-place). Collectively, the actions in these procedures could implement many of the required shelter-in-place activities; however, the roles, responsibilities, and response actions are not planned and integrated to fully implement the protective action. For example:

- Although site personnel recognize that it is not possible or desirable, in some cases, to secure air handling units in all facilities (either because of the facility operations or the external location of the unit controls), those facilities are not identified nor is their habitability analyzed so that the PSS and/or EM will be cognizant of their habitability limitations.
- Although utility services personnel are capable of securing a number of air handling units using the automated control system, there is no procedure to guide the response or indicate who (facility manager or PSS) would direct the actions.
- During a shelter-in-place event, building managers or facility representatives, who are assigned multiple buildings, and utility services personnel will not have access to manually operate the ventilation systems without coordinating their movements with the operations center; mechanisms for implementing this process are not established.
- Although some facilities have procedures to implement shelter-in-place and secure ventilation, a number of facilities do not have shelter-in-place procedures or instructions to locate and secure the facility air handling units.

The emergency plan and an implementing work instruction address accountability for the Pantex site. The accountability work instruction indicates that the EM or EMD initiates accountability, and describes the accountability process (using the personnel accountability system) as being either divisional or site wide. The work instruction also directs PSS actions for accountability during off-shifts. The operations center checklist tasks the PSS with determining and recommending the need for accountability, and the EAL guide sheets contain reminders to consider implementing personnel accountability. Also, the EOC coordinator has an operational emergency checklist that includes a reminder to conduct accountability. Finally, operations and emergency procedures direct personnel to report accountability (either those personnel missing or those present at a muster station) to the operations center. Although the plan and instructions provide a general mechanism for implementing accountability (primarily on a sitewide basis), some gaps and inconsistencies in the roles, responsibilities, and processes for achieving accountability exist. For example:

- Although the emergency plan and work instruction designate the EM as being responsible for accountability, the EM checklist does not have any related implementation actions.
- PSS responsibility for directing accountability prior to the EOC being operational is not explicitly addressed in the emergency plan or work instruction, and the operations center does not have a procedure or checklist to direct the implementing actions for accountability.
- The emergency plan and operations procedures do not address line management (for example, operations personnel or building managers) roles and responsibilities to achieve accountability (including building or area sweeps in those facilities where this action would be practicable) following a facility or building evacuation (either a process building or an office building).

Finding #3: B&W Pantex emergency response procedures do not comprehensively address personnel sheltering and accountability during an emergency, as required by DOE Order 151.1C.

To summarize, B&W Pantex has established plans and procedures that provide a solid foundation for their emergency management program and the emergency response actions of both B&W Pantex and PXSO personnel. Since the previous Independent Oversight inspection, the system of documentation has been redesigned and integrated into the site's document control system, and the efforts of site personnel to continue improvements to the processes are evident. Emergency response actions that address the critical response functions are adequately directed through a set of work instructions, checklists, desk aids, and other supporting tools. Nonetheless, procedures and processes for implementing shelter-in-place and accountability are not fully integrated into a comprehensive set of actions for these important protective actions. However, the overall B&W Pantex system of plans and procedures is well designed and supports an effective administrative program and satisfactory emergency response.

C.3 RATING

A rating of NEEDS IMPROVEMENT is assigned to the area of hazards survey and hazards assessment.

A rating of EFFECTIVE PERFORMANCE is assigned to the area of program plans and procedures.

C.4 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 offered to the site to be reviewed and evaluated by the responsible line management and accepted, rejected, or modified as appropriate, in accordance with site-specific emergency management program objectives and priorities.

B&W Pantex

- To ensure the technical accuracy of the chemical consequence assessment analyses in the EPHA, consider implementing a quality assurance process on the data provided by external contractors.

- To ensure appropriate and conservative material-at-risk quantities are analyzed in source term calculations, either use the total chemical quantity stored in a single location or consider using acceptable segmenting practices such as barriers or adequate separation distances.
- To enhance the usefulness of the EALs, consider evaluating the appropriateness of shelter-in-place for those facilities that contain indoor chemical concentrations with the potential for exceeding protective action criteria and add protective actions to the EAL that initiate controlled evacuations where needed.
- To ensure the desirable response is performed by the ICG that is also consistent with plans, procedures, and the level of training, review the roles and responsibilities within the ICG for responses to abnormal and operational radiological events. Consider the following actions:
 - Revise the emergency plan to describe the operation of the ICG and the members' expected roles and responsibilities during response to these types of events.
 - Review and revise the implementing emergency response documents based on the revised emergency plan.
 - Review the training and drill requirements for radiation services department personnel assigned as incident commanders, and ensure training is commensurate with their roles and responsibilities.
- To ensure consistent understanding of roles and responsibilities for reentry, review the emergency plan and related work instructions and consider the following:
 - Reconcile the roles and responsibilities of the incident commander, PSS, and EM for planning and approval of reentry and revise the emergency plan, if necessary.
 - Clarify the approval authority and process for authorizing personnel to exceed exposure limits.
 - Revise and/or prepare supporting documents to manage the exposures of emergency personnel who are authorized to exceed exposure limits, including, for example, methods for documenting training, acceptance of the increased exposures, and exposure monitoring.
- Enhance the implementation of timely protective actions by considering the following actions:
 - Revise the EAL logic diagram for a sitewide bomb threat to include classification and protective actions for suspicious packages in close proximity to hazardous materials.
 - Revise the work instructions and supporting documentation for the incident commander, PSS, and EM to include protective actions based on explosive standoff distance guides.
- To clarify the roles and responsibilities for approval of offsite notifications, review the forms and implementing documents and consider revising the implementing documents to ensure consistent and desirable execution of this process.

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 a specific facility or the site as a whole. This response includes the ability to make time-urgent decisions and take actions 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, documented program to educate the public and the media about actions that may be required during an emergency response.

The Office of Independent Oversight team evaluated the training, drill, and exercise programs used to support the Pantex ERO. As part of the programmatic review of the training, drill, and exercise elements, the Independent Oversight team evaluated the plans and procedures that support these elements, and reviewed training and proficiency records for key site emergency responders. Drill documentation and exercise reports were also reviewed for indications that they are being used effectively to enhance responder proficiency and to evaluate the level of the site's response preparedness. The Office of Independent Oversight team also evaluated EPI plans and applicable processes for an emergency at the Pantex Plant.

D.2 STATUS AND RESULTS

D.2.1 Training, Drills, and Exercises

Training and Drills

The August 2005 Independent Oversight inspection determined that Babcock and Wilcox Pantex, L.L.C. (B&W Pantex) had continued to revise and improve its training program through changes to the governing emergency preparedness plans and procedures and that the training required for each ERO position was well documented. However, ERO personnel continued to be placed on the roster without receiving instruction on the practical aspects of their position or demonstrating that they are capable of performing their assigned functions, and an effective process was not established to notify and train ERO members when substantive changes are made to plans and procedures. This 2008 Independent Oversight inspection found that B&W Pantex has continued to improve the emergency management training and drill program by effectively addressing the deficiencies identified during the August 2005 inspection and through other B&W Pantex initiatives as detailed below.

The B&W Pantex training and drill program is clearly described within the Pantex emergency plan, the training and drill program plan, the institutional training and drill program standards, and a series of work instructions that implement these plans and standards. These program documents provide all the essential mechanisms needed to ensure that site workers are trained in their response to operational emergencies, that offsite interfaces are provided training on the Pantex emergency management program, and that the Pantex ERO is staffed with knowledgeable and skilled personnel. A division training officer, training and drill coordinators, instructors, and databases support the development, maintenance, and administration of the training and drill program.

B&W Pantex provides periodic training to site workers in the form of general employee training and periodic drills. Periodic drills provide site workers with experience in shelter-in-place, seek shelter, and accountability protocols. Scheduled drills for fiscal year (FY) 2008 include: two sitewide accountability, one shelter-in-place, and one seek shelter drill. One of these, a combined sitewide shelter-in-place drill and personnel accountability drill was performed in the first quarter of FY 2008. The accountability portion was unsuccessful and a causal analysis is pending.

B&W Pantex provides offsite authorities with information on the Pantex emergency management program through a variety of methods including drills, exercises, local emergency planning committee meetings, and the public information program. Additionally, B&W Pantex performed a well-documented tabletop exercise with offsite interfaces; the training provided valuable information to offsite authorities. Training included radiological hazards, plume plots, the emergency planning zone, weather radios used to provide emergency information, and communication mechanisms. The ability to execute the concepts taught during this training will be tested in 2008 during the full participation exercise. An additional noteworthy offsite training session was scheduled for April 2008 in which the Emergency Management Department (EMD) arranged for Radiation Emergency Assistance Center/Training Site instructors, from Oak Ridge, Tennessee, to provide training to medical personnel at the local Veterans Affairs Medical Center, where any injured and potentially contaminated personnel from Pantex are sent.

Together, the Pantex emergency plan and the training and drill program plan contain the necessary provisions for an effective training and drill program to prepare ERO members. Specifically, they contain provisions for:

- Training needs analysis to identify needed training, training settings, and the frequency of periodic training.
- Initial and refresher training, including lessons learned.
- Initial qualification demonstrations and annual drill participation for all ERO members.
- Testing to demonstrate successful completion of training, and remedial training, when required.
- Up-to-date lessons plans and qualified instructors.

B&W Pantex has recently improved its ERO training capability by acquiring a trainer with significant teaching experience. Additionally, as part of a B&W Pantex training improvement initiative, EMD has recently changed most of the ERO courses from a computer-based training setting to an instructor led training session administered at their ERO work station.

The ERO training curricula, described in approved plans of instruction and contained in course presentation material, adequately prepare nearly all ERO members for their response functions and tasks, interfacing roles within the ERO, and membership in a functional team. Important aspects of the current curricula include:

- EMD added performance demonstrations and ERO position checklist training to address a finding from the 2005 inspection.
- EMD has strengthened ERO member training on changes to procedures, checklists, and response actions by incorporating procedures into the institutionalized procedure program. This process requires a training needs analysis whenever changes occur. This change was made to address a finding from the 2005 inspection.
- EMD has recently developed a separate emergency action level (EAL) course that is now being implemented. This course provides more details than the previous instruction provided on EALs.
- EMD continues to provide training to ERO members and site workers on lessons learned from Pantex and DOE complex operating experience databases.

To supplement the training program, B&W Pantex has developed a drill program that provides a well-defined process to provide ERO members with hands-on experience, as a means for program evaluations, and to promote program improvements. EMD evaluates all ERO members using the limited-scope performance demonstration, which is an evaluated drill, as part of their initial qualification process and annually thereafter. Additionally, EMD subjects ERO members to a number of scheduled drills (14 are scheduled for FY 2008) throughout the year to provide opportunities for ERO members to practice their skills at a variety of venues and in a number of ERO functions. EMD identifies improvement items during the performance of drills in hotwashes, documents them in a critique report, and enters them into a site tracking database to ensure corrective actions are taken. The Pantex Fire Department also uses this process for conducting building evacuation drills, which are performed under a separate drill schedule. In all cases, drill packages, critique reports, and drill schedules are performed and maintained as described in the program documents.

B&W Pantex effectively maintains an ERO roster and only assigns trained and qualified personnel to the roster. This represents an improvement since the 2005 inspection. EMD ensures only qualified B&W Pantex personnel remain on the ERO roster through the use of a B&W Pantex ERO training requirements matrix and an automated database, which contains the contents of the matrix. The database automatically generates e-mail notifications to B&W Pantex ERO members and the EMD training coordinator when training is coming due or is overdue. The EMD training coordinator ensures either the training requirements are satisfied or the B&W Pantex ERO members with training deficiencies are removed from the ERO roster. This process proved effective as the B&W Pantex ERO roster only contained qualified ERO member names.

Although the training requirements are generally well established, in a few instances the ERO training matrix is not completely defined for all ERO positions. Specifically, training requirements for the plant shift superintendent, the emergency operations center recovery team, and the Pantex spokesperson position are designated as “To Be Determined” (because these programs are undergoing change); the new EAL course is not contained in the matrix; and the Emergency Response Guidebook training course is not required for plant shift superintendents. Independent Oversight observed during the limited-scope performance tests that plant shift superintendents have Emergency Response Guidebooks available and use them.

To summarize, B&W Pantex has a comprehensive training and drill program that adequately prepares site workers, offsite authorities, and ERO members for their emergency functions. B&W Pantex effectively addressed the training and drill findings identified by Independent Oversight in 2005 and implemented other program improvements as well. ERO members now receive training on their position checklists, demonstrate their skills for initial qualification and annually thereafter, are provided training on significant changes to procedures when they occur, and the ERO roster is effectively maintained with only qualified ERO members listed. Additional program improvements have been made through the development of a new EAL course and by changing most courses from computer-based training to instructor-led training. However, a few ERO training requirements have yet to be defined for some positions, and the new EAL course and the Emergency Response Guidebook course are not required for all appropriate ERO positions.

Exercise Program

The August 2005 Independent Oversight inspection determined that exercise planning and assessment processes did not ensure that program and performance weaknesses were systematically identified and evaluated for corrective action largely because exercise objectives did not contain clear acceptance criteria, the criteria did not promote critical evaluations, and the exercise program was not supported by an effective corrective action process. This 2008 inspection found that B&W Pantex has effectively addressed these concerns by using improved objectives and acceptance criteria and by adopting the same issues tracking and corrective action processes that were previously determined effective for the drill program.

The B&W Pantex exercise program is clearly described within the emergency plan, a comprehensive exercise program plan, and implementing procedures, and the program provides the necessary guidance for planning, preparing, and conducting exercises in order to validate and improve all emergency management program elements. The exercise program is supported by an exercise planning committee and a database for tracking improvement items identified during the performance of exercises. The program plans and procedures provide all the essential mechanisms for developing a safe and effective exercise, a process to evaluate objectives, a method for reporting exercise results, and a system for managing corrective actions, as detailed below.

The B&W Pantex exercise program contains all the attributes required by DOE Order 151.1C and adopts the recommendations from the Emergency Management Guide. Specifically, it includes provisions for planning, documentation, conduct, and evaluation of exercises, and uses results to promote program improvements. The exercise program also includes requirements for controller and evaluator training, Pantex Site Office approval of the exercise packages, annual evacuation exercises and site-level exercises, and triennial invitations for offsite authorities to participate. These positive attributes were incorporated into the 2007 exercise package and associated after-action report, and the April 2008 exercise plan.

B&W Pantex improved the systematic testing and evaluation of emergency management program elements and the corrective action processes for exercise identified weaknesses. Specifically, beginning with the 2006 exercise, EMD has tracked program element objectives, tested in the annual exercises, for use in planning future exercises in order to ensure all elements are tested over a five-year period. Criteria are identified for each element objective that must be satisfied for a successful grade. These criteria are also used to validate corrective actions. The exercise program has adopted the use of the site corrective action tracking database for managing corrective actions for weaknesses identified during exercises.

However, recent annual exercises have not used scenarios with plausible onsite hazardous material releases. The past three annual exercises were all scenarios that resulted in operational emergencies not further classified. Two of these scenarios were offsite hazardous material releases from a nearby rail line and the

other did not include a hazardous material release. It is recognized, however, that the 2008 exercise will use a scenario that has a significant hazardous material release at Pantex.

To summarize, B&W Pantex has implemented a comprehensive exercise program that provides for detailed exercise packages with appropriate evaluation criteria and well-defined processes for conducting and evaluating the exercises. B&W Pantex has adequately addressed the exercise finding from the 2005 inspection by further defining exercise objective grading criteria and by adopting the site corrective action tracking database that will ensure corrective actions are implemented. However, in the past three years, exercise scenarios did not include any plausible onsite hazardous material release to serve as a test of program elements.

D.2.2 Emergency Public Information

The 2005 Independent Oversight inspection of the emergency management program did not include EPI. During this 2008 inspection, Independent Oversight found that the EPI program is an effective program commensurate with identified site hazards, and coordinated between Pantex Site Office (PXSO) and B&W Pantex public information offices. Cooperatively, these organizations have developed the EPI Program Plan and implementing checklists that document well-conceived concepts and processes that effectively address nearly all elements required by DOE Order 151.1C.

The B&W Management and Business Communications Department (MD&C) administers the B&W Pantex EPI program plan in conjunction with the EMD. The plan appropriately provides for a timely initial news release (through use of pre-approved templates by the operations center) within one hour of event categorization, and provides for the coordination of information with DOE/National Nuclear Security Administration (NNSA) Headquarters and offsite officials. The plan describes adequate facilities and provisions for a media center and a joint information center (JIC) with a clear set of roles and responsibilities for its maintenance and staffing. During the initial stages of an operational emergency, the EPI core team reports to the emergency press center (EPC), located within the emergency operations center, to access information regarding the incident and to perform EPI functions. Upon activation of the JIC, a portion of the EPI core team transitions to the JIC, in the role of the JIC management group. The PXSO public affairs officer is a member of the EPI core team and is involved with ongoing planning efforts with MD&C and the EMD.

In addition to emergency response functions, the EPI program contains an extensive public education component that includes several methods of interface and communication, and effectively informs the public of emergency plans and protective actions. This program, primarily the responsibility of MD&C, is a joint effort with the State of Texas and local offsite officials through an Agreement in Principle document. Outreach materials used to disseminate information to the public include calendars, brochures, and telephone books, for use in residences, offices, hotels, and other public locations; these provide appropriate protective action information such as shelter-in-place provisions, evacuation routes, relocation centers, and emergency alert system information. In addition, MD&C has ongoing communications with neighbors in the 10-mile emergency planning zone about emergency management activities and concerns, and publishes a neighborhood newsletter. B&W Pantex also provided each neighbor with a National Oceanic and Atmospheric Administration radio for emergency notification.

Although the program contains many positive attributes and the EPI core team is experienced in all the required processes, several EPI planning documents lack the details necessary to ensure consistent implementation of some of the processes, as required by their plan and DOE Order 151.1C. Specific examples are:

- While the EPI program plan appropriately addresses the process for the development of timely and accurate news releases, some implementing mechanisms for the approval process are incomplete or inconsistent. Specifically, the EPI program plan requires approval of news releases by the emergency oversight manager (EOM) and the emergency manager (EM). The EPC PXSO checklist requires approval by the senior technical advisor and the EOM. The EPC director checklist requires approval by the authorized derivative classifier and the EOM.
- Both the EPI program plan and the Pantex emergency plan require EPI staff involvement in the provision of accurate and timely information to site workers during an emergency. However, neither the EPI program plan nor the EPC checklists fully address implementation of that role; consequently, during one of the limited-scope performance tests, the EPI core team was unaware of their responsibility to facilitate site worker announcements with the operations center.
- The EPI program plan requires that EPC and JIC staff provide accurate information and document rumors. However, the implementing process to identify, report, and resolve misinformation/rumor control is not documented in the work instruction, EPI program plan, or the checklists.
- The EPI program plan states that in the event of a General Emergency, the EOM and EM will activate the JIC. However, neither the Pantex emergency plan nor any ERO checklists include requirements to activate the JIC upon declaration of a General Emergency. Further, the EPI training program provides that activation of the JIC by the EOM and EM will be in consultation with the EPI core team, but this consultation is not included in the EOM or EM checklists. Consequently, during one limited-scope performance test, EPC personnel were unaware that the EOM and EM activated the JIC and issued a news release that omitted information on JIC activation.

Finding #4: PXSO and B&W Pantex do not adequately document emergency public information processes and checklists for the approval of news releases, methodology for informing workers, provision of rumor control, and coordination of JIC activation, as required by their EPI Program Plan and DOE Order 151.1C.

Independent Oversight found that the EPI training program includes all the appropriate requirements to effectively support the EPI program and to maintain proficiency. These requirements include initial and refresher training; provision of position-specific and team training courses; involvement in a limited-scope performance demonstration; and annual participation in a drill, exercise, or actual event. The training program appropriately addresses the EPI responsibilities defined in the position checklists. In addition to this EPI training, both PXSO and B&W Pantex spokespersons participated in extensive annual spokesperson training sessions over the past three years. While the training materials indicate that the subject areas were thoroughly covered, spokesperson training is not officially part of the current site training program.

To summarize, the EPI program plan and supporting checklists implement well-conceived concepts and processes that effectively address nearly all elements required by the plan and DOE Order 151.1C. As designed, the training program effectively prepares the EPI organization to develop timely and accurate information and to operate a JIC. An extensive public education program supports the EPI program, informing the public of emergency plans and protective actions before and during emergencies. However, while execution of all the EPI processes is mostly successful due to the knowledge and experience of the EPI staff, implementing procedures require additional details related to the approval of news releases, facilitation of public announcements for site workers, provision of rumor control, and coordination of JIC activation.

D.3 RATING

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

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

D.4 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 offered to the site to be reviewed and evaluated by the responsible line management and accepted, rejected, or modified as appropriate, in accordance with site-specific emergency management program objectives and priorities.

B&W Pantex

- To ensure all future ERO trainees are provided with the desired training, consider adding the following to the ERO training requirements matrix and the training requirements database (PLATEAU):
 - The new EAL course.
 - The Emergency Response Guidebook course to the plant shift superintendent position.
 - The new curricula for the plant shift superintendent, the emergency operations center recovery team, and the Pantex spokesperson positions.
- To ensure all emergency management program elements are validated over a five-year period and to optimize the usefulness of annual exercises, consider the following:
 - Complete the five-year exercise program element matrix by recording elements tested in the years prior to 2006 to identify any elements that should be tested in the near term.
 - Increase the frequency of using exercise scenarios that result in postulated onsite hazardous material releases.

Pantex Site Office and B&W Pantex

- Strengthen and clarify the ERO and EPI roles and responsibilities regarding the news release approval process. Specific actions to consider include:
 - Clearly detail in the EPI program plan all roles and responsibilities for approving information to be released to the media and public. Develop a chart for time urgent referral.
 - Add the appropriate action steps associated with the approval responsibilities in each associated checklist (i.e., EM, EOM, authorized derivative classifier, PXS0 action officer etc.).
 - Clearly detail the approval process and each individual's role in the EPC Director, EPC public affairs officer (PXS0), and JIC Director checklists.

- Strengthen and clarify the EPI roles and responsibilities regarding the development of site worker public announcements. Specific actions to consider include:
 - Clearly detail in the EPI program plan the role of the EPC core team in the development of public announcement language in support of the plant shift superintendent.
 - Clearly detail that role in the EPC Director, EPC public affairs officer (PXSO), and news writer checklists.
- To enhance the process for rumor control, consider the following actions:
 - Review and amend, as necessary, the work instructions regarding the rumor control process and describe that process in the EPI program plan.
 - Add implementing details in the supporting checklists that describe the responsibilities of the media monitors, emergency telephone operator coordinator, public and media telephone operators, JIC news conference coordinator, the JIC Director, PXSO JIC representative, JIC spokespersons, EPC director, and EPC public affairs officer (PXSO). Specifically include responsibilities for identifying rumors and misinformation, use of the media question form, and interactions with other positions that are integral in the identification and resolution of misinformation in a timely manner.
- Enhance the effectiveness of the JIC activation by the EM, the PXSO EOM, and the EPC core team, and clarify their responsibilities and titles. Specific actions to consider include:
 - Review the arrangement with offsite officials to determine if automatic JIC activation at a General Emergency classification is the desirable response action.
 - Define the action steps required to activate the JIC automatically for the operations center, EOC, and EOC core teams.
 - Review the policy and coordination steps needed to activate the JIC to ensure they are appropriate.
 - Revise the EM, EOM, EPC Director, EPC public affairs officer (PXSO) checklists to clarify their responsibilities and titles. Define and incorporate all action steps into the checklists.
 - Revise the EPI program plan and implementing work instruction to update them to the current policies, roles, and responsibilities.
 - Provide criteria in the EPI program plan and implementing checklists that detail the transition of operations from the initial EPC core team to the JIC. Include protocols for the declaration of JIC operability and the transfer of EPI responsibilities to the JIC.

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 formulating protective actions, categorizing and classifying the emergency, and notifying onsite personnel and offsite authorities. Concurrent response actions include reentry and rescue, provision of medical care, and ongoing assessment of event consequences using additional data and/or field monitoring results.

The information provided in this section is based on observations from two sets of emergency management limited-scope performance tests (LSPTs) evaluated by the Office of Independent Oversight. Each set of LSPTs involved a combined assessment of response activities within the incident command group (ICG), plant shift superintendent's (PSS) office, and the emergency operations center (EOC). The Pantex incident command decision-making team consisted of security and fire officers, radiation safety and industrial hygiene representatives, and a Pantex Site Office (PXSO) representative. The EOC is staffed by an executive team that provides strategic management of the event and an environment, safety, and health team that performs consequence assessment functions. The executive team is composed of a Babcock & Wilcox Pantex, L.L.C. (B&W Pantex) emergency manager (EM), a PXSO emergency oversight manager (EOM), and selected EOC support staff. The environment, safety, and health team is composed of a plume modeler, WebEOC operator, and subject matter experts in the areas of radiological safety, industrial hygiene, and explosives safety.

Two operational emergency scenarios were developed for the LSPTs: a facility operational event resulting in a release of a hazardous radiological material, and a malevolent act involving the potential release of a hazardous chemical. The LSPT scenarios, which were developed by Independent Oversight in conjunction with PXSO and B&W Pantex trusted agents, were presented to the participants by the trusted agents to ensure scenario validity and delivery of accurate event cues.

E.2 STATUS AND RESULTS

In the event of an emergency, initial direction and control of the Pantex emergency response organization (ERO) is provided from the operations center by a duty PSS supported by a minimum of one additional PSS, while initial on-scene command and control is provided by an on-scene incident commander (IC). The position of IC resides with the most qualified fire department or security responder based on the type of emergency event. As the interim EM, the duty PSS is responsible for emergency classification, initial protective actions and protective action recommendations, recall of the ERO, and notification of onsite personnel and offsite authorities until relieved by the EM. ERO members in the operations center or the EOC support the IC in formulating subsequent protective actions as event information becomes known and consequence assessment results become available.

During the August 2005 inspection, with few exceptions, PSSs and emergency response decision-makers on the EOC emergency management team demonstrated effective performance during LSPTs, but consequence assessment and formulation of protective actions did not consistently ensure that on-scene responders and site workers were adequately protected. This 2008 inspection identified several performance strengths, particularly those related to IC performance in the on-scene incident command structure, and in the consequence assessment team's (CAT) demonstrated ability to effectively perform timely initial consequence assessment and formulation of protective actions based on updated and refined consequence assessment data. However, communications between response teams were not always effective throughout the entire response. Additionally, although the performance of the ICGs was effective, roles and responsibilities for incident command were not always as described in the emergency plan and response procedures.

E.2.1 Plant Shift Superintendents

During LSPTs, PSSs immediately assumed the role of interim EM, established an appropriate response organization, including a response by fire and security emergency resources, and provided safe route information to responders. Furthermore, the PSS demonstrated appropriate recall of EOC and ICG teams, communicated initial protective actions to site personnel, activated the Pantex alert warning system, and issued the prescribed protective action recommendations to offsite authorities, as required. The PSS demonstrated effective use of checklists to segregate and distribute time-urgent response tasks between PSSs. Once the Pantex EOC became operational, the PSS formally transferred authority as the interim EM to the EOC EM.

The PSSs consulted appropriate hazardous materials databases and building managers to determine hazardous materials involved in the postulated events. PSS teams consistently recognized emergency events and promptly categorized and classified operational emergencies within fifteen minutes of event discovery using appropriate discretionary or facility-specific emergency action levels (EALs). PSSs accomplished initial written offsite notifications in a timely manner, followed by verbal verifications to ensure offsite authorities received the notification form; however, initial notification forms characteristically conveyed a minimal amount of the available information. PSSs quickly implemented the site's default protective action of sheltering onsite personnel and provided safe routing instructions to the ERO staff, in accordance with EALs and associated guide sheets. However, the security event LSPT is designed in part to test anticipatory decision-making and the ability of the decision-maker to recognize the need to relocate responders and workers outside the applicable evacuation distances for a briefcase bomb. PSSs did not consider the potential blast effects from the suspicious package in their formulation of protective actions.

Communications weaknesses somewhat diminished what was otherwise an effective overall emergency response among the PSS, ICG, and EOC. Although the PSSs performed their emergency response duties using effective teamwork within the PSS office, they did not consistently ensure effective communications with the ICG and EOC throughout the response. During one of the tritium events, the release of material and revised onsite protective actions did not result in an appropriate update notification to offsite authorities. Incomplete and inadequate PSS event logs, combined with the operations center not providing event information for entry into WebEOC, also resulted in the absence of necessary information needed for emergency public information (EPI) tasks and decision-making in the EOC, which are further discussed in Section E.2.3. Additionally, several offsite notification forms did not have complete entries; however, the missing information was not critical. Furthermore, the PSS encountered problems establishing and maintaining the incident command phone bridge, which delayed the transmittal of event scene information to the PSS and EOC. As a result of a miscommunication of responsibility between the PSS and public affairs for issuance of the pre-approved initial news release, one PSS team did not issue the initial news

release (until directed by the LSPT controller), assuming it was the responsibility of the emergency press center (EPC) when staffed.

Finding #5: During LSPTs, emergency responders did not maintain effective communications among event scene responders, emergency managers, and response facilities, as required by DOE Order 151.1C and the Pantex Emergency Plan.

To summarize, PSS teams effectively demonstrated their ability to recognize operational emergencies, recall the ERO, and communicate initial protective actions to onsite workers. PSSs appropriately used EALs to categorize and further classify emergency events and consistently accomplished offsite notifications, with one exception, in a timely manner. However, communication weaknesses among the PSS, ICG, and EOC somewhat diminished what was otherwise an effective response.

E.2.2 Incident Command Staffs

Overall, Pantex ICs effectively demonstrated the capability to implement an incident command system (ICS) and lead the field response. ICs maintained operational control of the simulated response at the event scenes and frequently transmitted information via the bridge line to the PSS and EOC. Moreover, the ICGs are well staffed with knowledgeable personnel, including decision-making and support staff.

ICGs applied safe approaches in their response strategies and tactics, and security and fire department officers worked well together to conduct an initial assessment, to establish safe distances for the incident command post and response personnel, and to evacuate personnel from the isolation zone. Additionally, command post briefings ensured that response personnel exercised necessary precautions for personnel safety by keeping personnel upwind, closely monitoring weather conditions, and periodically assessing the habitability of the command post. Also, ICG personnel effectively used maps, response guides, and other resources to support assessments of the response and to develop mitigation strategies. The ICG effectively integrated mutual aid assistance from the Amarillo Police Department and local sheriff's departments, and appropriately included safe routing and staging of their responders.

During the security event LSPT, security and fire officers established a unified command with clear lines of authority in accordance with the emergency plan and response procedures. Radiation Safety Department supervisors assumed command during the tritium events and established unified command with security and the fire department. Radiation safety supervisors demonstrated a thorough understanding of the procedures and considerations for the tritium response, with the exception of the possible unavailability of radiation safety technicians who would have been sheltered in place. Nonetheless, emergency plan and procedures do not address the use of the radiation safety supervisor in the role of IC. Furthermore, ICs did not use the ICG checklist or develop a written Incident Action Plan, as required by procedure.

To summarize, Pantex ICs led a coordinated and effective response to security and operational events involving hazardous materials. ICGs are well staffed with knowledgeable personnel, including decision-making and support staff, who worked well together to conduct an initial assessment and develop appropriate response strategies and tactics. However, use of the radiation safety supervisor in the role of IC is not in accordance with the emergency plan or procedures. Additionally, ICs did not complete required checklists and incident action plans. These procedural and performance weaknesses did not substantially impact the overall effectiveness of the ICGs.

E.2.3 Emergency Operations Center Teams

Overall, the B&W Pantex EMs and PXSO EOMs demonstrated effective command and control, decision-making, and leadership within the EOC. EMs were familiar with most EOC operations and their assigned responsibilities, for example, verifying minimum staffing before declaring the EOC operational. Furthermore, EMs completed transfer of command from the PSS in a formal manner with ERO personnel informed of the transfer. Lastly, periodic situational briefings ensured the involvement of the EOM and appropriate EOC staff in key decision-making processes (e.g., EAL verification, onsite protective actions, and offsite protective action recommendations).

EOC response teams typically provided continuous, effective, and accurate event response. Additionally, EMs and EOMs used position-specific checklists to support decision-making tasks, and most EOC positions maintained event logs. However, Independent Oversight observed a few inconsistencies and weaknesses with some EOC activities. For example, the EOC did not always maintain effective coordination and communication with all external organizations, electing during one of the tritium events not to issue an updated notification form identifying the material release and revised protective actions. When reviewing the release information, the EOC determined that since the event classification would remain the same as the initial classification, updated notifications were not required. During both security events, EOC staff did not complete adequate “what if” analyses and strategies to determine if sufficient security and safety boundaries existed for the potential bomb threat.

EMs and EOMs implemented a well-planned course of action based on their current knowledge of the event situation; however, Independent Oversight observed some weaknesses related to situational awareness. For example, the EOC was not aware that the IC planned to evacuate downwind personnel following one of the tritium events, requesting the PSS to implement the protective action decision. All ERO activities were not supported with effective EPI. The EPC developed news releases and employee messages following receipt of information from the EOC and the PSS; however, the PSS did not routinely provide or distribute relevant EPI data to the EPC, which resulted in unnecessary confusion within the EPC and the potential for miscommunication of key information. Additionally, the EPC core group did not facilitate communications with the PSS relative to site worker public announcements, despite several requests for support by the PSS. The EPC, and other EOC staff, did not demonstrate an awareness that the JIC is required to activate for a General Emergency, resulting in an incomplete news release.

In summary, EMs and EOMs demonstrated effective command and control, decision-making, and leadership within the EOC. Overall, EOCs demonstrated the capability for determining and implementing a well-planned course of action to mitigate emergency events. However, communication weaknesses, similar to those discussed in Section E.2.1, resulted in reduced EPI effectiveness and EOC situational awareness. Additionally, EOCs did not complete adequate analyses to determine if sufficient security and safety boundaries existed for the potential bomb threat. Taken as a whole, these performance weaknesses did not significantly impact the overall effectiveness of the EOC teams.

E.2.4 Consequence Assessment

Overall, significant improvement in CAT performance was noted since 2005. The CATs effectively demonstrated required skills and knowledge including the appropriate use of consequence assessment tools. CAT modelers were proficient at meteorological monitoring and dose assessment modeling using appropriate software and systems. Additionally, the process for consequence assessment is appropriately integrated with processes for categorizing and classifying an emergency and protective action formulation.

Furthermore, CATs appropriately displayed consequence assessment products in the EOC and provided key decision-makers and EOC staff access to current data, information, and projections.

With few exceptions, CAT personnel provided appropriate guidance to the EM and adequately briefed the EOC on their assessments. Independent Oversight confirmed CAT proficiency in the use of the National Atmospheric Release Advisory Center dispersion modeling program, an activity that was identified as a weakness during the 2005 inspection. However, Independent Oversight observed a few inconsistencies and weaknesses with some other CAT activities. For example, neither CAT assessed the potential consequences from the blast effects of an explosive device detonation during the security events. Additionally, in two instances after the CAT leader correctly determined protective action distances, he verbally reported them in the wrong units of measure – available log sheets were not used and distances were given in feet instead of yards or meters. Although unrecognized in the EOC, the miscommunications were not detrimental to decision-making due to the conservative protective actions implemented by the IC. Lastly, one CAT did not provide input for classification decision-making even though this is required by the checklist.

To summarize, the CATs consistently demonstrated the ability to provide timely information to support protective action decision-making and event classification. Although a few inconsistencies and weaknesses were noted, particularly consequence assessment related to explosion and blast effect analyses, significant improvement in CAT performance is noted since 2005 and the CATs effectively demonstrated required skills and knowledge.

E.3 RATING

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

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

A rating of EFFECTIVE PERFORMANCE is assigned to the EOC teams emergency response decision-making.

A rating of EFFECTIVE PERFORMANCE is assigned to consequence assessment.

E.4 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 offered to the site to be reviewed and evaluated by the responsible line management and accepted, rejected, or modified as appropriate, in accordance with site-specific emergency management program objectives and priorities.

B&W Pantex

- To further enhance the command and control functions, consider the following actions:

- Define and document the prerequisite qualifications and training for all individuals expected to perform as ICs, such as radiation services department personnel.
- Develop a single emergency plan implementing procedure for incident command, applicable to all personnel/organizations expected to perform the function of IC. The procedure should promote a seamless response effort for all types of events, ensure a unified command structure as described in site plans, and support the transition from a security command to a fire department or other department command.
- Strengthen notifications and communications with offsite organizations. Specific actions to consider include:
 - Implement a verbal notification process that utilizes ring-down circuits to permit concurrent notifications with all offsite authorities as specified in agreement documents and DOE Order 151.1C requirements for each event classification.
 - Identify critical information on the notification form, to distinguish it from other less urgent information and to improve the efficiency of the initial notification.
 - Document all verbal information provided during the initial notification process to ensure repeatability and complete information transfer to all parties.
- When strengthening the ERO’s communications protocols, consider the following actions:
 - Provide an improved capability to record, sequence, validate, and track the flow of initial emergency information. This should be designed to improve overall situational awareness at all venues.
 - Emphasize the recording of all available information on the PX-2247 notification form and the actions taken on checklists used in the operations center and EOC.
 - Select a standard unit of measurement, English or metric, to be used by the ERO; also utilize software, resident on the EOC information management system, to enable conversion between standard and non-standard units.

APPENDIX F

Readiness Assurance

F.1 INTRODUCTION

Emergency management program administration includes elements of readiness assurance as well as performance of some planning and response functions. Readiness assurance activities ensure that the emergency management program plans, procedures, and resources of the Pantex Site Office (PXSO) and Babcock and Wilcox Pantex, L.L.C. (B&W Pantex) will facilitate an effective response to an emergency at the site. 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, implementing self-assessment programs, and ensuring that timely corrective actions are taken for identified weaknesses. NNSA field elements also have direct responsibility for performing some emergency response activities, including oversight of the site's emergency response and activities related to the release of emergency public information to site workers and the public.

This Independent Oversight inspection examined the processes by which PXSO provides guidance and direction to and maintains operational awareness of the Pantex emergency management program. The inspection included reviews of PXSO emergency management program assessment and issues management processes, and B&W Pantex emergency management self-assessment and issues management processes.

F.2 STATUS AND RESULTS

F.2.1 NNSA Line Program Management

The August 2005 Independent Oversight inspection determined that PXSO assigned an individual with direct responsibility for oversight and monitoring of the program, and effectively applied contract performance measures to guide and manage programmatic upgrades. PXSO also engaged in both informal and formal oversight activities of the site program, and was significantly supported by the NNSA Office of Emergency Management Implementation (NA-43) in the review of the Pantex hazards survey and emergency planning hazards assessment and verification reviews of corrective action closure packages. However, some PXSO and B&W Pantex corrective actions were not effective in addressing key underlying issues associated with several findings. This 2008 Independent Oversight inspection found that PXSO continues to effectively use contract performance measures and has initiated formal, documented assessments of the Pantex emergency management programs. However, weaknesses in the PXSO emergency response organization (ERO) training program were noted.

NA-43 provides active oversight of the PXSO and B&W Pantex emergency management programs, with current activities focused on preparations for the upcoming full participation exercise. In support of the exercise, NA-43 provided assistance in preparing the exercise package and will provide help with exercise logistics and evaluation. NA-43 is also coordinating the participation of a Headquarters emergency management team in the exercise.

PXSO has developed and implemented a comprehensive process for performing assessments of the contractor and PXSO emergency management programs. PXSO procedures for conducting contractor assessments and self-assessments appropriately include training requirements for assessors, objective evaluation criteria, and formal documentation of results. PXSO conducted or has scheduled formal assessments of all 15 contractor emergency management program elements over a three-year period. In addition, a PXSO Facility Representative assessed two of the seven Federal emergency management program elements over the last two years. PXSO assessments of the contractor emergency management program were performed while shadowing the contractor self-assessment on the same topic areas. Although there are some efficiencies and advantages to this approach, including oversight of the contractor self-assessment program, PXSO relies solely on the contractor to document items requiring improvement. As a result, no emergency management issues are tracked by PXSO. Both types of assessments primarily focused on ensuring that appropriate plans and procedures were in place for all applicable requirements. However, inconsistencies were noted in most of the assessment reports and included several criteria in the lines of inquiry that were not assessed and criteria marked as met with no indication on how that determination was made. In other cases, criteria were marked as met, yet the comments provided in the assessment report did not support that determination. In addition, assessments infrequently included a review of the implementation of requirements and as a result, assessments were not as rigorous as indicated by the lines of inquiry selected for the assessments.

The PXSO issues management process is comprehensive, but implemented informally. PXSO does not have an approved issues management procedure; however, a comprehensive draft issues management procedure was developed that includes all necessary aspects, including identification of root causes, prevention of recurrence included in corrective action development, tracking of corrective actions, and a verification and validation process for corrective action closure. However, because PXSO relies on the contractor to track issues identified by assessments, there have been no issues from emergency management assessments in the PXSO issues management system entered during the last three years.

PXSO verified that all corrective actions completed in response to the findings in the 2005 Independent Oversight inspection had been effective. Three findings were appropriately validated as effective through successful performance demonstrated during an exercise or through the successful completion of formal, documented assessments. However, the effectiveness review for the remaining four findings was limited to stating that corrective actions had been completed and did not include references to evidence demonstrating that the actions had been effective in resolving the underlying issues.

The PXSO emergency management program meets most programmatic requirements. PXSO successfully employs contractor performance measures that result in quantifiable improvements such as increasing the percentage of fully qualified ERO members and improving timeliness in key document submittals. In addition, PXSO provides informal feedback on contractor program performance through weekly and monthly meetings with B&W Pantex managers. Furthermore, PXSO reviewed and approved key contractor emergency management documents, and copies were sent to U.S. Department of Energy (DOE) Headquarters as required. However, few of the processes used to meet the programmatic responsibilities are defined or documented. The process for review and approval of emergency management documents is not included in the PXSO procedures, and expectations for the review of these documents are not defined. Furthermore, the PXSO Functions, Responsibilities, and Authorities Manual includes only a few of the site office responsibilities for emergency management, and PXSO has not pre-designated personnel to serve as the on-scene coordinator, senior Federal official, or senior energy official as required. Within PXSO, emergency management was recently transferred to the Assistant Manager for Safeguards and Security in order to place greater management emphasis on the PXSO emergency management program and oversight of the contractor, and also to address formality and documentation issues.

PXSO established appropriate training requirements for their ERO positions based on the recommendations of B&W Pantex. Requirements include ERO and incident command system (ICS) initial and annual refresher training courses and an annual demonstration of competency. The site training management system is used to document qualification status of the ERO members, and B&W Pantex enters course completion data into the system as ERO members complete their training requirements and annual demonstrations of competency. However, PXSO does not ensure that their ERO members have completed all training requirements and demonstrated competency before serving on the ERO. The ICS training requirements were not entered into the site training management system for the PXSO ERO positions, and completion of the ICS training requirements is not tracked by PXSO. Four members of the PXSO ERO did not complete all of the required ICS courses, and two more members did not complete annual ERO refresher training. In addition, one of those members also did not complete the annual demonstration of competency. All six members are currently included in the PXSO ERO. Furthermore, no one within PXSO is formally assigned the responsibility to ensure that their ERO members have completed all required training and demonstrated competency.

Finding #6: The PXSO does not ensure that their ERO members have completed all training requirements and are capable of fulfilling their assigned response functions before assignment to the ERO roster, as required by DOE Order 151.1C.

To summarize, PXSO continues to receive support from NA-43 and has established a comprehensive process for performing emergency management assessments. PXSO conducts formal assessments of the contractor and PXSO emergency management programs with a strong focus on ensuring requirements are included in contractor plans and procedures. In addition, a detailed issues management process has been implemented informally by PXSO, and an effectiveness review for the findings in the 2005 Independent Oversight inspection was conducted, although conclusions were not always well supported. Moreover, PXSO satisfies most emergency management programmatic requirements and includes effective contractor performance measures, frequent informal meetings with B&W Pantex management, and review and approval of contractor emergency management documents. Training requirements for the PXSO ERO positions are defined, and include initial and annual refresher training and an annual demonstration of competency; however, several members serving on the ERO have not completed all of their required training or demonstrated their competency. Additionally, in many instances, programmatic requirements are not proceduralized, and assessments are not well documented. Despite these weaknesses in documentation, program requirements are, for the most part, adequately implemented by PXSO.

F.2.2 B&W Pantex Feedback and Improvement

The August 2005 Independent Oversight inspection determined that B&W Pantex had effectively addressed the majority of the weaknesses identified during the previous inspection conducted in November 2002; however, corrective actions were not effective in addressing key underlying issues associated with several findings. This 2008 Independent Oversight inspection found that B&W Pantex effectively addressed the majority of the deficiencies identified during the August 2005 Independent Oversight inspection. Assessment and issues management processes continue to support an effective feedback and improvement program, and with few exceptions, corrective action processes were effective.

B&W Pantex has a well-defined system in place to provide senior managers with a broad range of information on the status of the emergency management program. The Emergency Management Department (EMD) distributes performance indicators monthly to senior B&W Pantex management and PXSO that cover a variety of topics such as, the number of assessment findings, corrective action status, ERO training status, equipment inspection results, pager recall test results, and offsite agency notification test results. EMD takes

action on any performance indicators that demonstrate a negative trend, and those actions are documented in the performance indicator report. In addition, a status report is sent monthly to senior managers regarding the assessments completed during the previous month, the assessments scheduled for the current month, and any assessments that are overdue. Further, an automated report from the corrective action tracking system is distributed weekly that lists all overdue corrective actions.

A comprehensive process for conducting annual assessments of the emergency management program has been defined and implemented by B&W Pantex. The site contractor assurance program appropriately includes the requirements of DOE Order 226.1 and provides a framework for conducting assessments that includes emergency management assessments. Emergency management assessments are further defined in a readiness assurance program plan; a work instruction; a desk aid; and yearly schedules, along with training that is required for emergency management assessment team leaders. EMD conducts well-documented assessments (based on the evaluation criteria in DOE Guide 151.1-3) of all 15 emergency management program elements annually.

The emergency management assessment reports document a strong emphasis on ensuring that all applicable requirements are included in appropriate plans and procedures. The assessments identified numerous opportunities for improvement associated with the incorporation of requirements into EMD plans and procedures. Several assessments also reviewed the implementation of plans and procedures, and consisted of observation of drills and equipment checks, verification of chemical inventories and training status, review of exercise after-action reports, and examination of documents prepared using EMD plans and procedures. These assessments were appropriately self-critical and resulted in four findings related to inadequate performance during a drill, inadequate staffing during a no-notice exercise, inaccurate hazardous chemical inventories, and personnel not completing all training as required before assignment to the ERO. Although these assessments provided meaningful feedback on implementation, the majority of assessments did not review implementation or did not document how implementation had been reviewed.

Emergency management assessments also include verification that corrective actions taken in response to previously identified findings and opportunities for improvement were effective in resolving the issues. This process, with one exception, has proven highly successful in ensuring resolution of issues. Annual assessments documented that seven corrective actions associated with previous assessments had been ineffective. Additional actions were immediately taken for six of the ineffective corrective actions; the issues were resolved, although the specific actions taken were not documented in the assessment reports. One corrective action was determined to have been ineffective in August 2007, and the assessment report indicated that a new problem evaluation request would be issued. The new problem evaluation request has not been issued, and the change in the work instruction that was indicated as needed in the assessment report has not been made. However, this is an isolated case and is not indicative of the overall effectiveness of the assessment program.

A detailed issues management process has been established to track the resolution of findings and selected opportunities for improvement from assessments and exercises. The sitewide issues management process is well defined by the emergency plan, associated work instructions, and corrective action planning templates. B&W Pantex effectively utilizes corrective action planning meetings between the issue owner and affected organizations to develop and prioritize corrective actions, determine an appropriate due date, and agree on the specific documentation that will demonstrate that the corrective actions have been completed. A formal validation process is in place for corrective actions to ensure actions were completed as stated, and closure of corrective actions requires the approval of the B&W Pantex EMD and the PXSO Emergency Preparedness Program Manager.

Timely and effective corrective actions have been implemented for most issues identified in the 2005 Independent Oversight inspection report and B&W Pantex self-assessments and exercises. The EMD developed appropriate corrective actions for most findings and opportunities for improvement. Corrective actions were largely completed by the assigned due date, appropriately validated as complete by B&W Pantex and PXSO, and verified as effective in an assessment conducted the following year. In a few cases, draft documents or procurement requests were used as corrective action closure evidence rather than approved documents or actual procurement of items, although all were subsequently approved or received. However, corrective actions have not yet been developed for one finding regarding the accuracy of hazardous chemical inventories identified in a September 2007 self-assessment due to disagreements over the organization that should be responsible for implementing the corrective actions.

To summarize, B&W Pantex provides a variety of information to senior managers on the status of the emergency management program through monthly reports on performance indicators, assessments, and corrective actions. In addition, the process for annual emergency assessments is well defined by appropriate plans, procedures, and schedules, and EMD performs detailed assessments of all 15 emergency management program elements annually. Additionally, corrective actions completed in response to previous issues are reviewed during assessments and are corrected immediately, in most cases, when the actions are proven ineffective. Further, the issues management process is comprehensive and includes corrective actions for most findings and opportunities for improvement discovered during assessments and exercises; corrective action planning meetings provide an effective forum for preparing corrective actions. Moreover, timely and effective corrective actions were completed for most issues and were validated as complete by EMD and PXSO. However, assessments generally focused on documentation and most did not review the implementation of requirements.

F.3 RATING

A rating of EFFECTIVE PERFORMANCE is assigned to the area of NNSA line program management.

A rating of EFFECTIVE PERFORMANCE is assigned to the area of B&W Pantex feedback and improvement.

F.4 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 offered to the site to be reviewed and evaluated by the responsible line management and accepted, rejected, or modified as appropriate, in accordance with site-specific emergency management program objectives and priorities.

Pantex Site Office

- Consider the following to improve the usefulness of effectiveness reviews for corrective actions:
 - Increasing the use of performance-related criteria in these reviews.
 - Improving documentation by including references to evidence used to support conclusions regarding the effectiveness of actions in resolving the underlying issue.

- Providing training in the conduct of performance-related reviews.
- To formalize and promote timely reviews and approval of contractor emergency management documents, consider developing written protocols that:
 - Specify the technical disciplines (e.g., safety analysis experts and Facility Representatives) required within PXSO for the review.
 - Include checklists and/or procedural guidance to address such review activities as verifying facility material-at-risk quantities, sampling release calculations, reviewing protective action criteria and associated distances, understanding the derivation of emergency action levels and associated protective actions, and reviewing the determination of the emergency planning zone.
 - Provide a method to capture the comment and resolution cycle during the review, and include a comment resolution process if necessary.
- Formally document the requirements and expectations for PXSO oversight of the Pantex emergency management program. Specific actions to consider include:
 - Clearly convey management’s expectations for oversight of the contractor and provide direction to the contractor on implementing emergency management policy and requirements.
 - Specify the training and experience requirements for PXSO personnel conducting self-assessments to ensure that they have the appropriate background to enable them to identify the expected standards of performance in the areas being evaluated.
 - Finalize the PXSO assessment reporting and issues management procedure.
 - Pre-designate PXSO personnel to serve as the site lead for national responses.
 - Establish a list of training, skills, and experience necessary for a new individual assigned responsibility for PXSO oversight of the Pantex emergency management program to ensure that the individual is appropriately qualified.
 - Use objective contractor performance measures that contain specific deliverables and fixed due dates.
- Enhance the ability of the PXSO ERO members to contribute to the success of the Pantex emergency response by considering the following:
 - Formally document the training and demonstration of competency requirements for all PXSO ERO positions.
 - Describe the responsibilities and processes for administering the PXSO ERO training program, including tracking completion of training requirements and annual demonstrations of competency, granting waivers of training requirements, and issuing Pantex ERO badges.

Pantex Site Office and B&W Pantex

- Improve the ability of the assessment program to identify and correct weaknesses in the emergency management program. Specific actions to consider include:
 - Balance assessment activities between evaluations of program document content and implementation of requirements.
 - Document the evidence (document reviewed and/or observation of implementation) used to determine whether evaluation criteria were met or not met in assessment reports.

B&W Pantex

- To promote continuous program improvement in the emergency management issues management process, consider the following actions:
 - When validation activities during an assessment identify continuing weaknesses, document the additional actions that were taken to resolve the weaknesses in the assessment report.
 - Close corrective actions based only on documents that are approved and implemented or equipment that is purchased and available for use.
 - Raise disagreements on the ownership of corrective actions to higher levels of management to ensure timely resolution.

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