

**Office of Independent Oversight  
and Performance Assurance**

**Focused Review of Emergency Management at the**

# **Kansas City Plant**

**Volume II**

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## Abbreviations Used in This Report

AL	Albuquerque Operations Office
AL-EMB	Albuquerque Operations Office Emergency Management Branch
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EOC	Emergency Operations Center
EPZ	Emergency Planning Zone
ERO	Emergency Response Organization
ERPG	Emergency Response Planning Guideline
ES&H	Environment, Safety, and Health
FM&T	Honeywell Federal Manufacturing & Technologies
HA	Hazards Assessment
KCFP	Kansas City Fire Department
KCP	Kansas City Plant
MAST	Metropolitan Ambulance Service Trust
NA-10	Office of the Deputy Administrator for Defense Programs
NNSA	National Nuclear Security Administration
OA	Office of Independent Oversight and Performance Assurance
OKCSO	Office of Kansas City Site Operations
PHA	Preliminary Hazards Analysis
SO	Office of Security

# OVERSIGHT

The Secretary of Energy's Office of Independent Oversight and Performance Assurance (OA) conducted an emergency management program review at the Kansas City Plant (KCP) in November 2001. The purpose of this review was to assess KCP's readiness to protect site personnel and the public from the consequences of onsite events that could result in the release of hazardous materials from site facilities and activities. The focus areas selected for this review included the site emergency management plan and implementing procedures; the emergency planning hazards survey and hazards assessment; offsite response interfaces; the emergency response training and drill program; and the feedback and improvement mechanisms specific to the emergency management area. In addition, tabletop performance tests were conducted for a sample of the site's initial decision-makers to evaluate the ability of emergency responders to mount an effective response to postulated emergencies.

In 1996, the Albuquerque Operations Office (AL) approved the KCP industrial standards transition plan, which shifted the bases for KCP environment, safety, and health management systems, including emergency management, from U. S. Department of Energy (DOE) orders to a set of "best practice" industrial standards. As a result, compliance with DOE Order 151.1A, *Comprehensive Emergency Management System*,



Aerial View of KCP Site

and the accompanying emergency management guide is not a contractual requirement. Instead, the KCP Emergency Plan, which is called out in the contractual "operating requirements list," serves as the requirements identification document for the KCP emergency management program. Consequently, for this review, the KCP Emergency Plan was used as the requirements basis for those elements of the KCP emergency management program that are under the direct control of the KCP management and operating contractor. However, DOE Order 151.1A was used for this review as the requirements basis for those elements of the KCP emergency management program applicable to AL and the Office of Kansas City Site Operations (OKCSO) because the site has not been formally exempted from DOE Order 151.1A.

KCP is situated on the 300-acre Bannister Federal Complex, which contains facilities occupied by several Federal tenants. Current site activities performed at KCP include the manufacture of non-nuclear mechanical, electronic, and engineered material components for U.S. national defense systems. These activities are conducted within several adjacent buildings, the largest of which is the Main Manufacturing Building (a portion of which the General Services Administration also occupies). KCP also provides national laboratories and government agencies with technical support services, including laboratory testing and analysis, training program development, and vehicle safeguarding.

The National Nuclear Security Administration (NNSA) Office of the Deputy Administrator for Defense Programs (NA-10) is the cognizant secretarial office for KCP. As such, it has overall Headquarters responsibility for programmatic direction and funding of activities at the site. At the site level, line management responsibility for the operation of KCP falls under OKCSO, which is a subordinate office of AL. For KCP, the Department's emergency management responsibilities are divided among OKCSO, AL, and the KCP management and operating contractor, Honeywell Federal Manufacturing & Technologies (FM&T).

The results of this review indicate that, overall, the KCP emergency management program provides an adequate response capability for potential accidents within the range of events analyzed in the emergency planning hazards assessment (HA). However, the KCP HA does not provide a complete, technically-sound basis for the site's emergency management program largely, because the industrial standards emergency management model is not equivalent to the DOE emergency management system, and no formal exemption from the requirements of DOE Order 151.1A was processed. In addition, the emergency management program is in many ways expert-based, relying on the knowledge, experience, and skill of decision-makers and staff rather than a comprehensive set of protocols, procedures, and job aids. The reliance on individual expertise, combined with a lack of

function-specific refresher training for key initial decision-makers and certain procedure deficiencies, resulted in some performance weaknesses that were demonstrated during emergency responder tabletop tests.

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

## 2.1 Positive Program Attributes

KCP has implemented an emergency management program that is generally commensurate with the range of hazards currently analyzed in the HA and provides confidence that the emergency response organization can mount an effective response to initiating events within this analyzed range. Positive attributes of the emergency management program are delineated in this section.

**The concept for initial emergency response adequately supports timely and accurate decision-making, and most associated decision-making tools are adequate.** For all events, security, environment, safety, health, and facility management personnel form a unified incident command system through which the event severity can be determined, appropriate protective actions identified, and notifications performed. A separate emergency operations center function is appropriately staffed and promptly activated for all operational emergencies and is available on short notice during normal working hours, which is generally when hazardous material operations are conducted. With some exceptions, the emergency plan implementing procedures, checklists, and other decision-making tools are adequate to support timely and accurate decision-making.

**Drills and exercises adequately test KCP emergency response capabilities and provide a mechanism for maintaining emergency response cadre proficiency and improving the emergency management program.** Drills and exercises are conducted at an appropriate frequency, and annual drill or exercise participation is required for all KCP emergency responders. Consistent with the range of analyzed events, the drill/exercise scenarios are challenging, and emergency response organization performance is evaluated against defined objectives and performance criteria. Performance improvement items are identified and corrected.



Offsite Response Units Participating in a Drill at KCP

**The offsite interfaces established by KCP adequately support the site's response capabilities for the range of analyzed events.** KCP relies on offsite fire departments, ambulance services, and hospitals to provide most emergency services. The KCP Fire Protection Department routinely interfaces with the Kansas City Fire Department, and they have a common understanding of roles and responsibilities. Effective KCP security protocols have been established for facilitating rapid emergency medical response and plant access by the offsite ambulance service. OKCSO and FM&T are proactively involved in the Local Emergency Planning Committee, which enhances the working relationship with other emergency planners and responders in the community and helps assure the compatibility of the KCP Emergency Plan with local organizations and resources.

## 2.2 Program Weaknesses and Items Requiring Attention

Although the KCP emergency management program provides an adequate response capability for currently-analyzed potential accidents, weaknesses in the program's technical basis were noted, including the absence of a formal exemption request from the requirements of DOE Order 151.1A, which is the mechanism used to ensure

equivalency with Departmental expectations for emergency management. Weaknesses in initial protective action decision-making by initial decision-makers and in the training program for emergency response organization cadre members were noted as well. Specific weaknesses are described below.

**The HA does not serve as a technically sound foundation for the KCP emergency management program in that it does not evaluate a complete spectrum of accidents and contains some important analytical weaknesses.** The HA event spectrum is limited to “credible” events that only include spills of hazardous materials and mixing of incompatible chemicals. The HA does not quantitatively evaluate events such as fires, explosions, and malevolent acts. In addition, the HA does not evaluate the maximum amount of material that may be at risk to determine the maximum consequences for certain postulated events, such as a spill of nitric acid during transportation on site, and the HA utilizes a computer code that does not accurately model heavy gas dispersion close to the release source. Therefore, the analysis of the potential consequences of some events is not conservative. As a result, all appropriate emergency planning and response provisions, such as pre-determined protective action recommendations, may not have been identified.

**Compliance with DOE Order 151.1A, *Comprehensive Emergency Management System*, is not a contractual requirement, and no formal exemption has been requested.** The KCP emergency management program is based on a set of “best practice” industrial standards that was developed and implemented several years ago as part of an initiative to reduce the costs associated with maintaining an

adequate emergency management program. The transition to the current set of standards was informally approved by AL (although not documented), but no exemption to DOE Order 151.1A requirements was ever developed, nor could any evidence be found that DOE Headquarters line management approved the permanent adoption of the standards in lieu of the order. Because the KCP HA only quantitatively evaluates a limited spectrum of “credible” accidents, the potential consequences of the worst-case accidents at KCP are unknown. A process is needed that would formally provide senior DOE line management with the information necessary to understand and acknowledge the complete range of risks of operating KCP outside of the DOE emergency management system.

**Initial response decision-makers did not demonstrate adequate proficiency in identifying and implementing protective actions for responders and other affected population groups during tabletop performance tests.** While performance was generally adequate in the areas of event recognition, categorization, and notification, some initial decision-makers appeared to have difficulty in formulating and implementing protective actions appropriate for the scenario conditions. These difficulties included weaknesses in using the 2000 Emergency Response Guidebook and the KCP HA as a source of protective action information. In addition, some initial decision-makers were uncertain regarding their responsibilities for recommending protective actions to nearby Federal facilities and potentially affected offsite entities following onsite events. In part, this can be attributed to weaknesses in the emergency response refresher training program, including the lack of job-specific training in protective-action decision-making.

KCP has implemented an emergency management program that is generally commensurate with the events analyzed in the HA. The concept of emergency operations described in the KCP Emergency Plan and associated implementing procedures establishes an emergency response organization that can adequately respond to mitigate incidents within this range of initiating events. With certain important exceptions, initial decision-makers demonstrated acceptable overall proficiency in executing their assigned roles and responsibilities. The KCP HA includes many of the elements required by DOE Order 151.1A in the manner described in the accompanying emergency management guide, even though this is not a KCP programmatic requirement. The emergency management training program meets most responder needs for the hazards that the site has identified, and drills and exercises are used effectively to validate the key elements of the emergency management program and maintain responder proficiency. Additionally, the necessary offsite response resources have been identified, integrated into the overall response approach, and periodically tested to assure a comprehensive response. Areas for improvement in the KCP emergency management program are being identified and addressed through a combination of assessment activities and exercises.



Emergency Management Drill

The robustness of the KCP emergency management program is, however, significantly limited by an HA whose analyzed spectrum does not include low-likelihood events that may cause the release of hazardous materials, and hence does not provide a complete programmatic foundation. This shortcoming results from the site having implemented an emergency management program that is based on a set of industrial standards that is not equivalent to the DOE emergency management system. Furthermore, a formal exemption to the requirements of DOE Order 151.1A has never been submitted to the appropriate level of DOE line management. Even for events within the envelope of the HA assumptions, the potential for classifiable emergencies may have been missed due to analytical weaknesses and inappropriate assumptions regarding the maximum amount of materials that could be involved in some events. Other concerns were identified as well. Weaknesses in certain emergency response procedures and tools, particularly in the areas of categorization and protective action identification and implementation, contributed to initial responder difficulties in performing critical time-sensitive actions, including protecting onsite workers and affected offsite populations. In addition, the lack of function-specific training in the emergency response organization's annual refresher training program could have contributed to some of the observed performance weaknesses. Finally, weaknesses in the various feedback and improvement mechanisms limit KCP's ability to identify higher-significance concerns and to continue to improve the effectiveness of the program.

The AL Emergency Management Branch (AL-EMB) and OKCSO are maintaining awareness of the KCP emergency management program. Both frequently interact with each other and the FM&T emergency management staff. Additionally, AL-EMB conducts staff assistance visits through which AL has identified areas for programmatic improvement, and AL annually

approves the industrial standards basis for the KCP emergency management program. OKCSO provides guidance and focus through document reviews and drill/exercise observations, and maintains significant involvement in the Local Emergency Planning Committee. During performance tests, OKCSO staff generally demonstrated their ability to assess initial contractor decisions during emergencies. Notwithstanding these positive attributes, several important weaknesses were identified in the rigor of DOE line management oversight. The most significant of these was that AL and OKCSO have not ensured either that the basis for the KCP emergency management program is equivalent to the DOE emergency management system or that a formal exemption to the requirements of DOE Order 151.1A was processed. Other weaknesses were identified in the rigor of the AL-EMB staff assistance visits and in the performance of a few OKCSO duty officers in ensuring that adequate protective actions were promptly initiated by FM&T. Finally, the informal manner with which OKCSO's awareness and oversight

activities are planned, conducted, and documented limits their effectiveness in influencing long-term improvement.

Overall, the results of this review indicate that KCP has implemented an emergency management program that, within the range of analyzed hazards, provides the structure, mechanisms, and resources necessary for mounting an effective response to a site accident. However, the consequences of the full range of potential site accidents are not known. Consequently, the emergency preparedness and planning aspects of the KCP program may be incomplete and could contain significant vulnerabilities that senior Departmental line managers have unknowingly accepted because KCP has not been formally exempted from DOE Order 151.1A requirements. Line management attention is necessary to ensure that a comprehensive, technically-based path forward is developed to implement an emergency management program at KCP that meets the needs of the Department and KCP stakeholders.



This review focused on a detailed assessment of four key emergency management programmatic elements. Consequently, no overall program rating has been assigned. The individual element ratings reflect the current status of the respective KCP emergency management program elements. It should be noted that the rating assigned below to the feedback and improvement section is specific to those feedback and improvement mechanisms applicable to the emergency management area.

The ratings for the individual program elements are:

Emergency Management Program Basis, Plan, and Procedures .....	NEEDS IMPROVEMENT
Hazards Survey and Hazards Assessment .....	NEEDS IMPROVEMENT
Training, Drills, Exercises, and Offsite Response Interfaces .....	EFFECTIVE PERFORMANCE
Feedback and Improvement .....	EFFECTIVE PERFORMANCE

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# APPENDIX A

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## SUPPLEMENTAL INFORMATION

### A.1 Dates of Review

	Beginning	Ending
Planning Meeting	October 17, 2001	October 18, 2001
Onsite Review	November 5, 2001	November 15, 2001
Report Writing	November 19, 2001	December 3, 2001
Validation and Outbrief	December 4, 2001	December 6, 2001

### A.2 Review Team Composition

#### A.2.1 Management

Glenn S. Podonsky, Director, Office of Independent Oversight and Performance Assurance  
Michael A. Kilpatrick, Deputy Director, Office of Independent Oversight and Performance Assurance  
Charles Lewis, Director, Office of Emergency Management Oversight  
Patricia Worthington, Director, Office of Environment, Safety and Health Evaluations  
Thomas Staker, Deputy Director, Office of Environment, Safety and Health Evaluations (Team Leader)

#### A.2.2 Quality Review Board

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

#### A.2.3 Review Team

Steve Simonson (Topic Lead)  
James O'Brien  
David Schultz  
Jeffrey Robertson

#### A.2.4 Administrative Support

Mary Anne Sirk

## APPENDIX B

### SITE-SPECIFIC FINDINGS

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

FINDING STATEMENT	REFER TO PAGES
OKCSO, AL, and NNSA have not ensured either that the DOE Order 151.1A exemption process has been appropriately used to demonstrate programmatic equivalency or that senior DOE line management has been given the information necessary to understand and acknowledge the complete range of risks of operating KCP outside of the DOE emergency management system, as required by DOE Order 151.1A.	12
The KCP Emergency Plan, implementing procedures, and other response documents do not in all cases accurately reflect actual response practices, define required emergency response actions, or adequately support accurate and timely decision-making during operational emergencies, as required by the KCP Emergency Plan.	14
Not all FM&T initial decision-makers effectively implemented emergency response actions in a timely manner to ensure event mitigation and adequate protection for all members of affected onsite and offsite organizations, as required by the KCP Emergency Plan.	16
Not all OKCSO duty officers were proficient in assessing initial contractor decisions and ensuring that adequate protective actions were promptly initiated, as required by DOE Order 151.1A.	16
OKCSO and AL have not ensured that DOE’s emergency planning policy for analyzing the complete spectrum of events has been implemented at KCP, as required by DOE Order 151.1A.	19
FM&T has not appropriately evaluated and documented the consequences of some credible events, such as the release of hazardous materials from spills and mixing of incompatible materials, as required by the KCP Emergency Plan.	19
Emergency response organization annual refresher training does not include all required course topics and is not specific to functional or support positions, as required by the KCP Emergency Plan.	23

## APPENDIX C

# EMERGENCY MANAGEMENT PROGRAM BASIS, PLAN, AND PROCEDURES

## C.1 Introduction

An emergency plan describes the results of a technical evaluation of emergency conditions that may affect facilities and the site, and identifies and defines the program that must be established, including the necessary response organization and resources, to effectively mitigate the consequences of analyzed events. The emergency plan and implementing procedures must clearly define roles, responsibilities, and authorities, and provide detailed instruction for accomplishing the preplanned actions.

This Office of Independent Oversight and Performance Assurance (OA) evaluation focused on the Kansas City Plant (KCP) Emergency Plan and implementing procedures, and the resources established by the plan for the Honeywell Federal Manufacturing & Technologies (FM&T) and Office of Kansas City Site Operations (OKCSO) organizations. The primary goal was to determine whether the plan and procedures fulfill the goals and standards established by Department of Energy (DOE) policy, requirements, and guidance, and whether they are capable of providing adequate protection to site responders, co-located workers, and the public in the event of an emergency at the site. Data collection activities included performance-based, tabletop evaluations of key members of the emergency response organization (ERO) to assess the ability of initial decision-makers to categorize events; protect responders, co-located workers, and offsite populations; and make required notifications, using established protocols and job aids.

## C.2 Status and Results

### C.2.1 Emergency Management Requirements Basis

As mentioned in the introduction to this volume, DOE Order 151.1A is not identified as an operating requirement for KCP. Instead, the KCP emergency management program is based on a “best practice” set of industrial standards (i.e., applicable Code of Federal Regulations plus selected management best practices). The genesis for the adoption of industrial standards

was a January 1995 memorandum from the cognizant program office (DP-22) authorizing implementation of a pilot transition program as a vehicle to provide an emergency management program that was less costly while still providing an adequate level of protection for site workers and offsite entities. Following a one-year pilot program that used a set of standards proposed by FM&T (which did not include DOE Order 151.1 or its predecessor), and a subsequent analysis of the standards by representatives of the Albuquerque Operations Office Emergency Management Branch (AL-EMB) and OKCSO, Albuquerque Operations Office (AL) management apparently approved the set of operating requirements for KCP in late calendar year 1996. No formal approval documentation by AL could be located, and no evidence could be found to indicate that the DOE Headquarters program office (DP) or the Headquarters emergency management office (NN-60, now SO-40) formally approved the final adoption of the industrial standards as the permanent basis for the KCP emergency management program.

AL annually approves the industrial standards basis for the KCP emergency management program through the environment, safety, and health (ES&H) management plan. The KCP Emergency Plan, which describes the current programmatic structure and content, is a specific contractual requirement (through the operating requirements list) and is approved through site and OKCSO line management. AL reviews (but does not approve) the Emergency Plan and forwards it to the Headquarters Office of Security (SO).

The absence of an exemption to DOE Order 151.1A was identified in the March 26, 2001, report of the AL-EMB staff assistance visit, and discussions between SO, AL-EMB, and OKCSO regarding whether to proceed with an exemption have been ongoing for most of calendar year 2001. In response to the AL-EMB assistance visit report, the OKCSO Manager recommended in a May 10, 2001, memorandum that the concept of “industrial standards” for the emergency management area be reconsidered, in part because of the perception that an extensive exemption to DOE Order 151.1A would be problematic for DOE Headquarters to approve. AL-EMB has not yet responded to this memorandum.

Except for a few specific exclusions, DOE Order 151.1A applies to all DOE elements, including the National Nuclear Security Administration (NNSA). Requests for exemptions must be justified, demonstrate equivalency, and be submitted to the Deputy Secretary for approval. It should be noted that these requirements have remained essentially unchanged since before KCP's transition to industrial standards. However, the KCP emergency management program does not achieve equivalency with DOE Order 151.1A, most notably in the emergency planning hazards assessment (HA) area, and no exemption has ever been sought. Because the KCP Emergency Plan requires that only "credible" accidents (i.e., limited to spills of hazardous materials and mixing of incompatible chemicals) be analyzed in the HA, the potential consequences of a complete spectrum of potential events are not known. This significant weakness is discussed in more detail in Appendix D.

**FINDING: OKCSO, AL, and NNSA (NA-10) have not ensured either that the DOE Order 151.1A exemption process has been appropriately used to demonstrate programmatic equivalency or that senior DOE line management has been given the information necessary to understand and acknowledge the complete range of risks of operating KCP outside of the DOE emergency management system, as required by DOE Order 151.1A.**

### **C.2.2 Emergency Plan, Procedures, and Response Resources**

The emergency management system at KCP is defined and implemented by several tiers of plans and procedures. These tiers consist of an Emergency Plan; appendices to the Emergency Plan that provide job aids and instructions for protective actions; work instructions; and a Facility Manager Manual. The FM&T Emergency Plan was published in July 2001 and subsequently approved by OKCSO. The plan describes the industrial standards emergency management system for the KCP that was developed using Federal laws and regulations, as well as the KCP emergency planning HA, as its basis. The plan format generally follows DOE Order 151.1A and the associated guidance, and it addresses such elements as the emergency response organization, emergency event identification, and emergency public

information. The Emergency Plan prescribes the use of the nationally-recognized unified incident command system that includes onsite fire, security, and facilities management resources for all events and readily integrates the response with offsite resources. The plan calls for use of an emergency operations center (EOC) to provide strategic planning and support to the incident command function for all operational emergencies.

An important weakness in the document hierarchy is that the Emergency Plan and supporting implementing procedures do not clearly define decision-making roles and responsibilities. The Emergency Plan specifies that direction and control of the emergency response flows from the OKCSO emergency manager (the Director of OKCSO or designee) to the FM&T president, who is responsible for the initial response to and mitigation of the emergency. Notwithstanding the Emergency Plan description of these roles and responsibilities, OKCSO and FM&T senior management describe their respective roles as equivalent to day-to-day operations: FM&T manages the incident response, and OKCSO monitors and concurs in contractor decision-making. In addition, authority for initial activation of the ERO is not clearly defined. During day shift, the Emergency Plan reflects that the OKCSO Manager will declare the emergency; during back-shifts, the FM&T facility manager (or designee), with concurrence of the OKCSO duty officer if available, will declare the emergency and make necessary notifications. In contradiction to the Emergency Plan expectation that the OKCSO Manager will declare an emergency, several implementing documents and performance tests indicate that the facility manager will declare the emergency with concurrence of the OKCSO duty officer for any shift. Clear definition of roles and responsibilities, undivided by organizational boundaries, is required during initial emergency response to ensure that all actions are completed in a timely manner.

Appendix B of the Emergency Plan lists protective actions for the 12 emergency initiating conditions considered credible by the KCP HA. Some protective action considerations, such as reserve rescue team availability prior to re-entry, are further addressed in work instructions. However, in several cases, the event-specific responses are not detailed and rely heavily on an expert-based system of responder training and skills. For example, Protective Action No. 6 – Onsite Spill, first step, requires, "Initiate immediate evacuation of the spill site and secure the site to prevent

entry.” No further methodology or pre-determined protective actions are specified in the appendix or in any other KCP procedure (such as the Spill Control Plan) for determining impacted areas from spills of hazardous materials. The expectation at KCP is that the incident commander and members of his/her staff will initially use the 2000 Emergency Response Guidebook and the KCP HA to determine appropriate protective actions for responders, workers, and offsite organizations; however, this expectation is not proceduralized.

Appendix C of the Emergency Plan provides EOC job aids, which are position-specific checklists for members of the EOC staff, including FM&T and OKCSO. The job aids rely heavily on an expert-based system of responder skills and lack the detail necessary to make the checklists effective tools for less-experienced responders during an event. For example, the FM&T Security checklist requires only that all security activities be addressed, that communications be monitored for security concerns, and that communications with AL EOC security personnel be established. Other activities, such as establishing interfaces with local jurisdictions, are not addressed. The OKCSO-ES&H and Security checklist only addresses notifications to offsite jurisdictions; other considerations, such as independently assessing the initial and potential impacts and concerns of the emergency response, are not addressed.

Supporting, but separate from the Emergency Plan, an FM&T process description entitled “Emergency Management Process” includes a checklist specific to incident command team responsibilities. The composition of the incident command team specified by the checklist is comprehensive and includes functional positions, such as a safety officer, required by the national incident command system model, as well as a public information officer and a plume modeler. These additional functions reduce the overall burden on incident command and allow focus on event mitigation and worker safety. Activities specified for incident command team members are generally comprehensive and address the major expected actions in sufficient detail. The incident command checklist is available in a format suitable for use at the event scene. However, the checklist does not include a step for ERO activation.

Several FM&T work instructions implement provisions of the Emergency Plan. These work instructions generally lack detail or are inaccurate for specific subject areas. For example, the work

instruction for reporting and responding to an emergency requires only that FM&T associates report emergencies to Patrol Headquarters and proceed to designated assembly or sheltering areas. The instruction lacks other details for associate response, such as the correct number to call for a chemical spill, and is inconsistent with initial employee training, which requires the associate to return to the scene at a safe distance after performing notification in order to guide emergency responders to the scene. The work instruction for conducting event notifications does not adequately address emergency reporting requirements or convey the urgency of categorizing site events, including emergency conditions. This instruction improperly requires event categorization within two hours of discovery, even for operational emergencies, followed by oral notification within the next 30 minutes. No mention is made of the expectation stated in DOE Order 232.1A, *Occurrence Reporting and Processing of Operations Information*, that categorization be performed as soon as practicable (but within two hours); if the notification work instruction were followed as written, oral notifications could be significantly delayed.

The Facility Manager Manual is used by facility managers and OKCSO duty officers to perform categorization and notification decision-making. Attachment 2, “Categorizations and Exceptions,” is a matrix of thresholds derived from the DOE occurrence reporting manual that defines conditions requiring the reporting of certain events as unusual or off-normal occurrences. KCP has correlated the ten occurrence reporting groups with many other thresholds derived from DOE Order 151.1A that constitute operational emergencies not requiring classification. Although the matrix is an effective initial decision-making tool for occurrence reporting, several concerns were noted with its effectiveness as an operational emergency decision-making tool; these concerns were reinforced by performance problems observed during tabletop exercises. For example:

- Some thresholds do not include anticipatory declarations based on potential consequences if a specified event condition degrades.
- Some thresholds are not readily measurable by initial decision-makers, such as an Emergency Response Planning Guideline (ERPG)-2 level on site.

- Some thresholds required by DOE are not included in the matrix, such as a mass casualty event that is not related to transportation.
- Some thresholds (e.g., “security activity”) are too broad and require interpretation that may be problematic during initial, time-urgent decision-making.

**FINDING: The KCP Emergency Plan, implementing procedures, and other response documents do not in all cases accurately reflect actual response practices, define required emergency response actions, or adequately support accurate and timely decision-making during operational emergencies, as required by the KCP Emergency Plan.**

### C.2.3 Performance-Based Testing Results

The KCP Emergency Plan establishes FM&T as the initial decision-maker. The role of OKCSO is that of a concurring authority. Any worker who discovers an off-normal condition sets initial response in motion. The worker reports the condition to Patrol Headquarters, who dispatches the acting fire sergeant, Security, and the facility manager to the event scene. The interim incident commander is the fire sergeant until relieved by the manager of the Fire Protection Department or manager of ES&H. During day shift, the incident command staff and EOC may be activated quickly; during the back shift, it may take an hour to fully staff the functions. Although not prohibited, hazardous operations are generally not conducted during the back shift in order to minimize precursors to significant events. Mitigation of significant events, such as internal structural fires, requires support from offsite response.

Performance tests were administered to three groups of emergency responders, as described below. In keeping with the site practice to generally conduct hazardous material operations during normal working hours, these tests simulated events during day shift when staff augmentation was available to the interim incident commander.

### Incident Commander, Facility Manager, and Security Manager Teams

The FM&T incident commander, facility manager, and security manager form a unified incident command system in response to significant events. Tabletop performance tests were conducted with four incident command teams to verify that these response personnel are knowledgeable of their authorities and responsibilities and can utilize their procedures, checklists, and other response tools effectively to categorize postulated events; determine protective actions for responders, co-located workers, and offsite jurisdictions; and perform notifications. Two facility-specific scenarios (an operations event and a security event) were presented to the incident command teams by an FM&T trusted agent. The trusted agent ensured scenario validity and delivery of accurate event cues.

Most incident command teams demonstrated good knowledge and coordination of their respective roles and responsibilities. Additionally, most incident commanders demonstrated good command and control and effectively delegated responsibilities for response actions to members of the incident command staff. All teams promptly recognized the postulated conditions as emergency conditions, and most teams initiated response actions in accordance with applicable procedures and checklists. Initial scene assessment was generally performed well. However, concerns were noted with some initial decision-making. Two incident commanders did not consider wind direction, which could have impacted the approach path or the expected arrival point for offsite responders. One incident command team did not order the balance of the ERO activated, and one facility manager did not initiate ERO activation until 11 minutes into the event. Although overall command and control were performed well, one incident commander became focused on the rescue of a casualty and did not utilize the incident command priorities and status worksheet.

Most facility managers correctly categorized both postulated events. However, one facility manager improperly categorized one operational emergency as an unusual occurrence. Upon prompting by the OKCSO duty officer (role played by trusted agent), the facility manager recategorized the event correctly. Offsite notifications were promptly initiated by all facility managers after emergency categorization.



Protective actions for responders, co-located workers, and offsite organizations were formulated and implemented well in most cases, but some instances of poor performance were observed. All incident command teams used the plant's emergency notification system to perform immediate notifications to affected plant populations. In response to a credible security threat, all incident command teams promptly evacuated the scene and correctly sheltered co-located workers away from the threatened area. However, one incident commander ordered a rescue team back into an evacuated area affected by the security threat to perform a personnel sweep without any reports of missing persons. In response to a postulated hazardous material spill, two incident commanders effectively implemented protective actions for affected groups. However, one incident commander did not determine and establish an initial isolation zone for the hazardous material spill, did not determine and ensure that personal protective equipment was adequate for re-entry to rescue a casualty, did not determine the correct fire suppressant to mitigate the event consequences, and did not consider the downwind consequences of the event. The fourth incident commander did not make recommendations to potentially-affected offsite organizations, and deferred his responsibility for decisions regarding search and rescue of a casualty to the fire sergeant team leader; both of these actions conflict with KCP Emergency Plan requirements. Consequently, offsite populations and onsite responders might not have been adequately protected from the effects of the postulated release.

### **Response Personnel for Offsite Transportation Event**

OA conducted a performance test of KCP's capability to respond to a request for supplementary emergency response information from a local incident commander managing a simulated on-the-road emergency event involving a KCP shipment of hazardous materials, as would be required by Department of Transportation regulations related to transportation emergency response information (49 CFR 172). The concept of emergency response is essentially the same as for an in-plant event: Patrol Headquarters is notified of the event and then should immediately contact the environmental operations duty officer (who, for hazardous material shipments, is the cognizant facility manager) to provide supplementary information and perform decision-making. Patrol

Headquarters, manned 24 hours per day, is the emergency contact point listed on KCP hazardous materials manifests and bills of lading. The duty officer's telephone number is also on the manifest. The Patrol console operator demonstrated awareness that Patrol personnel could receive a request from a field incident commander for emergency response information concerning a KCP shipment.

Although a KCP work instruction exists for addressing emergency events on the road, Patrol did not have the instruction available. An informal instructional guide directs Patrol to perform the activities specified in the work instruction, but Patrol officers present during the performance test had not been trained on the work instruction or the guide and were not aware of either document. Consequently, Patrol attempted to respond to detailed requests for supplementary information on an affected shipment even though they were not trained or qualified to do so, rather than contacting the cognizant hazardous materials shipment facility manager. Approximately three dozen bills of lading were haphazardly collected in a wall holder, making it difficult to find a particular document in a short time, and many documents appeared to be associated with completed shipments.

Two environmental operations staff are designated facility managers for hazardous materials shipments. They have the authority and responsibility to provide emergency response information to field responders, and to perform event categorization and notifications on behalf of FM&T when warranted. A performance test was administered to one environmental facility manager. This individual possessed a good knowledge of shipments. The manager conducted daily reviews of shipping manifests to assure continuous awareness of hazardous materials that could be involved in events. Shipping manifests were available to the manager, as was the 2000 Emergency Response Guidebook, to provide supplementary emergency response information. However, this individual was not well acquainted with his responsibility for initiating emergency notifications. When presented with a hypothetical scenario involving a significant event on the road, the manager did not initially utilize the Facility Manager Manual to guide his response actions. The manager also did not recognize the significance of establishing an initial isolation zone at the accident scene by the local incident commander as a trigger for time-urgent response actions by KCP, and incorrectly categorized an operational emergency event as an off-normal occurrence. Eventually, the manager properly

concluded that categorization and notifications could be performed by FM&T if the OKCSO duty officer's concurrence could not be obtained.

**FINDING: Not all FM&T initial decision-makers effectively implemented emergency response actions in a timely manner to ensure event mitigation and adequate protection for all members of affected onsite and offsite organizations, as required by the KCP Emergency Plan.**

### OKCSO Management and Duty Officers

Five OKCSO managers and duty officers assigned the role of concurring authority to emergency categorization decisions made by the contractor facility manager were interviewed to determine their knowledge of roles, responsibilities, and authorities, as well as their ability to evaluate FM&T initial response actions. Most OKCSO staff demonstrated a clear understanding of their responsibilities in assessing initial contractor decisions, including the need for timely reporting of operational emergencies. Staff correctly concurred in decisions that were consistent with the categorization matrix. However, when presented with an incorrect event categorization by the facility manager, two of five staff concurred in the facility manager's assessment that the postulated operational emergency was an unusual occurrence because some of the threshold criteria were met. Additionally, one of the OKCSO staff believed that it was inappropriate for FM&T to transmit protective action recommendations to offsite organizations, even though such recommendations are required by the Emergency Plan and other response documents.

**FINDING: Not all OKCSO duty officers were proficient in assessing initial contractor decisions and ensuring that adequate protective actions were promptly initiated, as required by DOE Order 151.1A.**

### C.3 Conclusions

The KCP Emergency Plan and associated implementing procedures establish an industrial-standards-based emergency response system that provides adequate resources to mitigate events for the

spectrum of accidents analyzed in the KCP HA. In addition, most initial decision-makers demonstrated acceptable overall proficiency in performing their assigned roles and responsibilities. However, the rationale for adopting the less rigorous emergency management industrial model (which does not require the analytical evaluation of events such as fires, explosions, and malevolent acts) rather than the DOE emergency management model was not formally reviewed and accepted by senior DOE line management. Additionally, emergency response procedures and tools designed to accomplish the critical objectives of timely and accurate decision-making do not in all cases support the response staff in performing their assigned duties, and several instances were observed where implementation of required response actions was not effective, most notably in identifying and/or recommending protective actions for responders and offsite populations.

### C.4 Rating

The emergency management program, plan, and implementing procedures at the KCP are not fully developed, and demonstrated responder proficiency does not in all cases provide adequate assurance that workers and the public are protected following emergency events. A rating of NEEDS IMPROVEMENT is therefore assigned.

### C.5 Opportunities for Improvement

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

#### FM&T

- Ensure that emergency plans and procedures define roles and responsibilities in accordance with the manner in which the emergency management system is intended to be operated.

- As part of the procedure development/improvement process, consider using individuals who are responsible for procedure implementation to conduct procedure verification (for accuracy) and validation (for usability).
- Continue enhancing tools employed by incident commanders and initial responders, such as position-specific checklists and job aids.
- Conduct performance-based training for initial decision-makers that focuses on weaknesses observed during tabletop performance tests, such as determining protective actions for all affected population groups.

#### **AL/NNSA**

- Develop a strategy for the KCP emergency management program that weighs the complete risk of site operations against the additional costs of adopting DOE Order 151.1A as a contractual requirement. As a first step, consider directing the development of an HA that evaluates the full range of accident initiators to completely define the potential operating risks, and then using the results as a decision point for how to proceed.

#### **OKCSO**

- Work with NNSA (NA-10), AL, SO, and FM&T to develop a project plan that establishes the activities and milestones necessary to resolve the concerns about application of DOE Order 151.1A.

# APPENDIX D

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## HAZARDS SURVEY AND HAZARDS ASSESSMENT

### D.1 Introduction

The emergency management requirements of the U. S. Department of Energy (DOE) are based to a large extent on the commercial nuclear power emergency management model and include such elements as emergency action levels for event classification, pre-determined protective actions, and emergency planning zones. DOE provides flexibility in its emergency management requirements so that site-specific programs will be established that are commensurate with the site hazards, both chemical and nuclear. The level of emergency classifications, type of pre-determined protective actions, and extent of the emergency planning zone are to be based upon a site/building-specific analysis of the hazards. In accomplishing this graded approach, emergency management planning efforts begin with the hazards survey, which is the identification and qualitative assessment of site-specific hazards and associated emergency conditions that may require a response. If the hazards survey identifies hazardous material quantities that pose a potentially serious threat to site workers or the public health and safety, then a quantitative hazards assessment (HA) is performed to estimate the severity of the impact.

The Office of Independent Oversight and Performance Assurance (OA) evaluation of the Kansas City Plant (KCP) hazards survey and HA included a review of analytical methods and results and several building walkdowns to determine how well the hazards survey and HA serve as the technical basis for the KCP emergency management program.

### D.2 Status and Results

#### D.2.1 Hazards Survey

Honeywell Federal Manufacturing & Technologies (FM&T) has developed a hazards survey that covers all the facilities and activities at KCP, even though not contractually required to do so. The hazards survey states that it meets the intent of DOE Order 151.1A, and it includes most of the information required by this order, such as a brief description of the type, use, and occupancy of each building and a list of hazards

the building may be exposed to. However, the survey does not provide data on the Federal, state, and local emergency preparedness requirements that apply to the various facilities at KCP as specified in the order. In addition, although the hazards survey identifies those facilities that store or use hazardous materials and further identifies those facilities that contain hazardous materials greater than the threshold planning quantity, it does not describe how this information was developed. Furthermore, neither the hazards survey nor the Emergency Plan describes how the hazards survey is to be maintained or how it is used to establish the operational emergency base program. The hazards survey, if properly performed and documented, can support development and maintenance of the site's operational emergency base program and serve as a viable emergency response tool, in accordance with DOE's expectations.

#### D.2.2 Hazards Assessment

The KCP HA was first developed in 1993. At that time, KCP was required to comply with the 5500 series of emergency management orders, which included very specific requirements for performing an HA. The results of the original HA indicated that some events could impact personnel outside of the immediate vicinity of the event and therefore warranted developing emergency action levels to promptly classify the emergency, and establishing pre-determined protective actions. In 1994, KCP undertook an effort to eliminate or reduce hazardous materials used on site to eliminate classifiable events or reduce them to a lower emergency level. This good practice is recommended in DOE's emergency management guide. In addition, KCP reanalyzed its HA to correct an error identified by the Headquarters Office of Emergency Management during a 1994 technical assistance review of the HA. As a result of these efforts, KCP concluded that no postulated events would result in consequences beyond the immediate vicinity of the event and, therefore, that no events would warrant classification.

In 1995, KCP transitioned to industrial standards and is no longer contractually required to abide by the DOE emergency management order (DOE Order 151.1A, which replaced the 5500 series orders).

Although neither the KCP contract nor the KCP Emergency Plan requires compliance with DOE Order 151.1A, the KCP HA states that it meets the intent of DOE Order 151.1A. It includes many of the elements prescribed by the order and the associated emergency management guide, and many good practices were followed in developing the HA. For example, the HA development process included a review of hazardous material databases, building walkdowns, and involvement of building/activity subject matter experts. Furthermore, the HA includes a list of hazardous materials stored, used, or transported in the vicinity of KCP that could affect the site (identified from discussion with the Local Emergency Planning Committee and Union Pacific Railroad officials). Finally, the DOE Office of Kansas City Site Operations (OKCSO) formally reviewed and approved the HA.

However, the HA's ability to serve as the technical basis for the emergency management program is significantly degraded because the HA did not evaluate a complete spectrum of potential events that could cause the release of hazardous material. Specifically, the spectrum of events that were analyzed was limited to design basis events and only included spills of hazardous materials and mixing of incompatible chemicals. The HA states that beyond-design-basis accidents are considered "incredible" events and provides a brief qualitative argument justifying this conclusion. For example, the rationale for not evaluating explosions was that "an explosion that damages a structure to the extent that a TPQ [threshold planning quantity] volume of material is involved...will be considered an incredible or beyond design basis event." This rationale does not adequately justify the statement that this type of event cannot occur, and it does not address whether an explosion involving hazardous materials in quantities less than a threshold quantity is possible and may have consequences warranting emergency response beyond the locally affected area. As a result of the manner in which FM&T identifies credible events, the HA does not quantitatively evaluate events such as fires, explosions, earthquakes, aircraft crashes, and malevolent acts (as discussed in DOE's emergency management guide). Evaluation of these events could indicate that their consequences warrant event classification at the Alert or higher classification level. For example, the 2000 Emergency Response Guidebook recommends isolating and evacuating 50 to 100 meters if a spill of sulfuric acid is not involved in a fire, but recommends expanding that distance to 800 meters if a fire is

involved. Consideration of fire and explosion scenarios is particularly important for some KCP hazardous materials, such as sulfuric acid and toluene diisocyanate, that have low volatility at ambient temperatures but may be released at a much more significant rate if involved in a fire or explosion.

**FINDING: OKCSO and AL have not ensured that DOE's emergency planning policy for analyzing the complete spectrum of events has been implemented at KCP, as required by DOE Order 151.1A.**

Additionally, weaknesses were identified in the HA analysis of some of the events that KCP considers credible. For example, some event scenarios did not postulate the worst-case incident (for example, considering the maximum amount of nitric acid that could be spilled during transportation) so that the maximum consequences could be identified. In addition, although FM&T performed an informal analysis of the consequences of a hazardous material release from a classified process, this analysis was not included in the HA. Furthermore, the HA utilized a computer code that does not accurately model the dispersion of heavy gases close to the source of the release (within approximately 100 meters), and therefore, the analyses of the potential consequences of some events (e.g., spill of nitric acid and tetrafluoroethane) are not conservative. Finally, the background information supporting some of the conclusions in the HA—for example, input data and analysis used to identify the type, magnitude, and location of toxic gases such as chlorine that could be generated from mixing incompatible chemicals—is not well documented. The significance of these weaknesses is that they call into question the conclusion in the HA that no events warrant an emergency classification at the Alert level or higher.

**FINDING: FM&T has not appropriately evaluated and documented the consequences of some credible events, such as the release of hazardous materials from spills and mixing of incompatible materials, as required by the KCP Emergency Plan.**

In addition, a weakness was identified in the screening criteria for hazardous materials used to determine whether event scenarios that may cause their release should be developed. FM&T used the table of hazardous materials and associated threshold planning quantities contained in 40 CFR 355 to screen the

materials. This is only one of the sources of data on hazardous materials specified in DOE Order 151.1A for screening hazardous material; two other data sources referenced in the order are 29 CFR 1910.119 and 40 CFR 68. In addition, DOE's Emergency Management Guide recommends consideration of smaller quantities of hazardous materials (below the regulatory thresholds) that might adversely impact co-located workers or the public. This recommendation is particularly pertinent to sites, such as KCP, that are in close proximity to populated areas. The KCP HA states that hazardous materials less than the regulatory thresholds were evaluated; however, that evaluation was not documented. These weaknesses raise concerns about the rigor and completeness of the process used to identify hazardous materials requiring quantitative assessment in the HA.

Finally, a deficiency was identified in the manner in which the HA is maintained. FM&T has established a framework for maintenance of the HA, based on conducting a preliminary hazards analysis (PHA), which has the potential to be an effective mechanism for identifying plant changes warranting an update to the HA. However, because a baseline of maximum quantities of hazardous materials allowed in a process or location has not been established, it is difficult for responsible department personnel to determine when the PHA should be initiated. In addition, although the PHA process provides a good framework for maintaining the HA, one instance was identified during this review where it was not effectively implemented to update the HA. In this case, the PHA was appropriately initiated for a new work activity and forwarded to the emergency management organization for review. However, although the emergency management organization review identified a need to update the HA to reflect this activity and led to revision of the affected emergency plan fact sheet, the HA was not revised.

### **D.2.3 HA Output Products**

Because the KCP HA did not identify any events that warranted prompt protective actions beyond the immediate vicinity of the event, output products such as emergency action levels (to support event classification) and pre-determined protective actions beyond the immediate event scene were not developed. KCP does identify an emergency planning zone (EPZ),

designated as the boundary of the Bannister Federal Complex. Given the consequences of event scenarios identified in the HA, no EPZ is required under the DOE emergency management system. However, an evaluation of a more complete spectrum of events in the HA and re-evaluation of some of the currently addressed accidents may result in the need to re-examine the extent of the EPZ and the need to develop emergency response tools, such as emergency action levels, for event classification and pre-determined protective actions.

## **D.3 Conclusions**

FM&T developed a hazards survey and HA that includes many of the elements in DOE Order 151.1A and the accompanying emergency management guide, even though FM&T was not contractually required to comply with the order. The hazards survey and HA provide a good summary of facility operations and accidents that could impact the site, and the HA includes a quantitative analysis of the consequences of spills of hazardous materials. However, weaknesses prevent these documents from serving as an adequate technical basis for establishing an emergency management program that is commensurate with the site hazards. The most significant deficiency in the KCP HA is that it does not address the full spectrum of events that could cause the release of hazardous materials. In particular, events such as fires and explosions have not been evaluated. Other deficiencies include a lack of identification of the maximum amount of materials that could be impacted in some events and the use of a computer code that does not adequately model heavy gas releases. As a result of these deficiencies, emergency planning and response tools such as pre-determined protective actions for hazardous material releases that could impact co-located workers and the public in close proximity to the plant have not been developed.

## **D.4 Rating**

The KCP HA does not provide assurance that the consequence of all potential events that might require an emergency response have been adequately evaluated to support development of emergency response tools, such as pre-determined protective actions. A rating of NEEDS IMPROVEMENT is therefore assigned.

## D.5 Opportunities for Improvement

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

### FM&T

- Create a document derived from the DOE Emergency Management Guide (Volume II) that describes the process to be used at KCP for developing and maintaining the HA. This document could also define what supporting documents should be retained to justify analytical assumptions, analysis specifics, and sources of data.
- Evaluate whether the HAs might better serve as a tool for developing pre-determined protective actions if some buildings are considered as

separate facilities. For example, the polymer building is separate from all other buildings, has some unique hazards, and uses processes different from the main building; these characteristics may make it useful to analyze the building as a separate facility.

- Revise the HA to resolve minor inconsistencies. For example, most (but not all) of the tables include information on the quantity of hazardous materials at various locations. In addition, minor discrepancies were identified in the quantities for some materials (e.g., Figure 15 as opposed to Appendix D for sulfuric acid).
- Provide the rationale for assumptions made in the HA consequence assessment so that the basis for the analysis can be readily understood and the HA can be easily maintained. For example, no rationale was provided for the assumed CO<sub>2</sub> release rate. In addition, the consequence analysis used an unspecified vapor pressure for some hazardous materials.

# APPENDIX E

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## TRAINING, DRILLS, EXERCISES, AND OFFSITE RESPONSE INTERFACES

### E.1 Introduction

To develop and maintain the necessary emergency response capabilities, a coordinated program of training through instruction and drills must be an integral part of the site emergency management program and must apply to all emergency response personnel and organizations relied on to respond to emergencies. For a training program to be effective, it must include both initial training to develop individual and team skills and periodic training to keep the emergency response organization (ERO) proficient while keeping pace with changes in plans, procedures, and facility equipment. A drill and exercise program must be established to determine whether the ERO's skills are compatible with the level of detail of procedures and whether ERO members are effective in responding to an emergency condition using available tools and equipment. For the exercise program to be effective, it must provide critical and periodic assessments of emergency responses designed to exercise all elements of the emergency response program using realistic event scenarios.

For those response capabilities that are not available on site, offsite organizations and agencies must be identified to provide the necessary support for a comprehensive and integrated response. Authorities, responsibilities, notification procedures, communication protocols, and information necessary in the event of an emergency should be pre-determined and agreed upon with the offsite response organizations. The effectiveness of offsite response interfaces should be tested as part of the site's drill and exercise program.

The Office of Independent Oversight and Performance Assurance (OA) reviewed the Kansas City Plant (KCP) training, drill, and exercise programs and offsite response interfaces to determine whether these programs provide the requisite integration, coordination, and training to prepare responders to perform their assigned duties during emergency conditions. The scope of the review included interviews with onsite and offsite emergency planners and a review of the Emergency Plan, implementing procedures, and training products, such as course descriptions and drill and exercise packages.

### E.2 Status and Results

#### E.2.1 Training

The KCP Emergency Plan describes the emergency management training program as a graded approach to performance-based training. The graded approach is based on the KCP hazards assessment (HA), and because the HA does not identify any events that result in a significant release of hazardous material, ERO training is designed for a site having only low-consequence events. Elements of the KCP emergency management training program include initial ERO training, annual ERO refresher training, hazards awareness training for all Honeywell Federal Manufacturing & Technologies (FM&T) associates, drills, and exercises.

The Emergency Plan contains general training requirements for ERO training, and some of these requirements are implemented by a work instruction that provides a reference to the applicable training course description. Initial training for ERO members consists of a one-hour training course and participation in a drill or exercise. The initial ERO training course is often one-on-one and provides some specific functional or support position training as required by the Emergency Plan. The course covers various topics, including operation of the emergency management system, communications equipment, roles, responsibilities, authorities, and the drill and exercise schedule. Annual refresher training for the ERO includes a one-hour refresher course and participation in a drill or exercise. The FM&T training and qualification system is used to track the status of qualifications and completed training. A review of the training and qualification system database indicated that all ERO members had received the training required by the Emergency Plan. Additionally, the incident commanders had received training on incident command and hazardous waste operations as required by 29 CFR 1910.

In addition to the training provided to the ERO, all FM&T employees are provided initial and annual refresher hazards awareness training through an online training course. These courses adequately cover



actions that may be required of all workers, such as reporting chemical spills and emergencies, evacuation and sheltering, and personnel accountability. Each course includes a test, and satisfactory completion of the refresher training is tracked for all personnel to ensure that the annual requirement is met. Additionally, an evacuation/sheltering drill is conducted annually for all FM&T and Office of Kansas City Site Operations (OKCSO) personnel.

Notwithstanding these positive elements, the KCP ERO training program is not well documented and in some instances does not meet the requirements specified by the Emergency Plan. ERO training was not developed based on job task analyses or a documented evaluation of the minimum training and qualifications required for ERO positions. As a result, training does not comprehensively address all the tasks that ERO members are expected to perform.

Annual ERO refresher training does not cover all the course topics identified in the Emergency Plan, such as emergency categorization and protective actions, two areas where weaknesses in ERO proficiency were noted during tabletop performance tests (see Appendix C). Specific functional or support position training is limited to a brief review of emergency operations center checklists. Additionally, plume modelers (ERO members) received credit for participating in a drill/exercise even though the scenarios did not exercise that function. Overall, the annual ERO refresher training requirements specified in the Emergency Plan have not been fully implemented.

**FINDING: ERO annual refresher training does not include all required course topics and is not specific to functional or support positions, as required by the KCP Emergency Plan.**

Additionally, some ERO positions require training or qualifications that are not delineated in the Emergency Plan or ERO training work instruction. For example, the incident commander must also receive training in incident command and hazardous waste operations as required by 29 CFR 1910. Currently the emergency management coordinator ensures that the incident commanders get this training; however, there is no programmatic requirement or mechanism to ensure that this training is completed as a prerequisite to an ERO assignment. In response to this concern, FM&T initiated actions to add new position codes to the training and qualification system database to make the additional training mandatory.

## E.2.2. Drill and Exercise Program

The drill and exercise program at KCP serves not only to validate the elements of the emergency management program but also to qualify the ERO. Annual participation in a drill or exercise is required for the ERO. Although there is little written guidance concerning the drill/exercise program, the drill/exercise packages provide adequate documentation, including the objectives, evaluation criteria, scenarios, and lessons learned. Drills/exercises are conducted at an appropriate frequency, as specified by the Emergency Plan. Scenarios are sufficiently challenging, consistent with the events that are analyzed in the HA, and involve the participation of offsite response organizations and co-located Federal agencies. Lessons learned are documented, and the completion of corrective actions is typically documented in the drill/exercise report. Lessons learned from drills and exercises are fed back into the annual ERO refresher training program.

## E.2.3 Offsite Response Interfaces

KCP relies on offsite organizations to provide emergency fire, medical, and security services. The KCP Fire Protection Department is only manned and equipped to fight small fires; therefore, the support of Kansas City Fire Department (KCFD) companies is required to respond to a fire of any significance. The Metropolitan Ambulance Service Trust (MAST) provides ambulance service for the site. The Kansas City Police Department supplements KCP Security as necessary. Although there are no formal agreements between FM&T and offsite fire departments, ambulance services, or hospitals, the support provided by these offsite organizations is consistent with their normal function in the community.

The KCP Fire Protection Department and Security have written procedures that adequately address interfaces with offsite organizations responding to a KCP fire or medical emergency, including provisions for command and control, communications, security, and safety. The KCP Fire Protection Department and the KCFD have a common understanding of their roles, responsibilities, and authorities. The KCP Fire Protection Department routinely interfaces with the KCFD, and emergency response efforts are well coordinated. KCP provides an escort who is knowledgeable of facilities and hazards for each offsite fire company team and provides fire plans for the affected facility. KCP and KCFD communications

equipment is compatible outside the site facilities, and provisions are in place for KCP to provide communications equipment that will function inside the facility. In addition, MAST response to medical emergencies at KCP is well coordinated with site security, as was demonstrated during an actual medical response at the site during the evaluation period, and is consistent with established protocols.

In addition to the coordination efforts with offsite responders, FM&T and OKCSO are active members of the Local Emergency Planning Committee, which is composed of industry, local government, fire, and police department staff from four counties. Participation in this committee enhances working relationships with other emergency planners and responders in the community and helps assure the compatibility of the KCP Emergency Plan with local organizations and resources. Additionally, representatives from co-located Federal agencies indicated that communications and cooperation with KCP have been good and should improve with the planned implementation of the Occupant Emergency Management Committee for the Bannister Federal Complex, which will coordinate emergency planning activities for all the Federal agencies on the site.

### E.3 Conclusions

Overall, the training, drill, and exercise program generally meets the needs for the hazards that KCP has identified. Drills and exercises are used effectively to train and validate the elements of the emergency management program. Additionally, offsite response interfaces are identified and tested to assure a comprehensive and integrated response. However, the ERO annual refresher training program does not fully implement the requirements of the Emergency Plan and does not adequately support the initial decision-making process, particularly in light of the reliance on the knowledge and experience of ERO cadre members to respond effectively to any site emergency.

### E.4 Rating

Training, drills, exercises, and offsite response interfaces at KCP are generally effective. A rating of EFFECTIVE PERFORMANCE is therefore assigned.

## E.5 Opportunities for Improvement

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

### FM&T

- As a best management practice, consider performing a systematic analysis of the tasks to be performed by the ERO using a simplified approach, such as a tabletop job analysis. Use the results of this analysis to develop position- and function-specific training requirements and course material.
- Document all ERO training and qualification requirements in the ERO training work instruction. For example, in addition to training provided by the emergency management organization, the incident commanders must also receive training in incident command and hazardous waste operations.
- Evaluate the training, drill, and exercise programs to ensure that personnel are trained to respond to an emergency when the full ERO cadre is not present on site. This capability could be particularly important if the HA reanalysis for the complete spectrum of events identifies additional initiators that could lead to an event after normal work hours.

# APPENDIX F

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## FEEDBACK AND IMPROVEMENT

### F.1 Introduction

Feedback and improvement constitutes one of the five core functions of the integrated safety management system governed by U. S. Department of Energy (DOE) Policy 450.4, *Safety Management System*. A sitewide evaluation of feedback and improvement programs is documented in Volume I of this report. However, this appendix documents the evaluation of feedback and improvement programs specific to emergency management and their ability to provide the mechanisms to identify, track, and correct deficiencies and program weaknesses identified from assessments, exercises, and other activities.

The Office of Independent Oversight and Performance Assurance (OA) team assessed Office of Kansas City Site Operations (OKCSO) and Honeywell Federal Manufacturing & Technologies (FM&T) feedback and improvement elements that are directly related to the Kansas City Plant (KCP) emergency management program, including line management oversight, assessment programs, and the issues management system.

### F.2 Status and Results

#### F.2.1 AL-EMB and OKCSO Line Management Oversight

A key attribute of an effective feedback and improvement program is the involvement of DOE line management in providing programmatic guidance and focus, which at KCP is conducted by designated personnel within the Albuquerque Operations Office Emergency Management Branch (AL-EMB) and OKCSO. AL-EMB has assigned a lead emergency management point of contact for the KCP site. This individual maintains awareness of the KCP emergency management program through periodic discussions with the OKCSO emergency management specialist, conducting staff assistance visits, and observing emergency management exercises. OKCSO does not perform formal assessments of the KCP emergency management program; instead, OKCSO relies on AL-EMB for programmatic reviews. The March 2001 AL-EMB review appropriately identified programmatic

weaknesses and improvement items, but itself contained several inaccurate or misleading observations, the most significant of which was an erroneous statement that the hazards assessment (HA) meets the requirements of DOE Order 151.1A. The report identified the lack of an approved exemption to DOE Order 151.1A in the executive summary section, but the Albuquerque Operations Office did not provide clear direction or any recommendations in the body of the report regarding pursuit of an exemption by the site.

The OKCSO emergency management point of contact, who spends approximately 25 percent of his time on emergency management matters, is knowledgeable of the status of the KCP emergency management program and maintains awareness primarily through document reviews (e.g., Emergency Plan, HA), drill/exercise observations, frequent meetings with FM&T emergency management staff, and periodic discussions with the AL-EMB point of contact. In addition, as discussed in the previous section, OKCSO has significant involvement in the Local Emergency Planning Committee, which helps to foster a cooperative relationship with local emergency response agencies.

The OKCSO awareness and oversight activities contribute positively to the site's emergency management program; however, the informal manner in which they are planned, conducted, and documented limits the effectiveness of DOE line management oversight as a long-term improvement mechanism. As discussed in the feedback and improvement section in Volume I of this report, OKCSO lacks formal protocols or procedures for conducting and documenting these operational awareness activities. As a result, the document reviews do not include pre-determined evaluation criteria, and results are transmitted informally through document notations or e-mail, rather than being formally transmitted to the contractor. Programmatic observations are not formally captured, tracked, or trended. In addition, exercise observations are typically communicated informally to the contractor for inclusion in the exercise report, although in the case of the 1998 full-participation exercise, OKCSO provided a stand-alone evaluation report.

## F.2.2 FM&T Internal and External Assessments

The FM&T emergency management assessment program consists of formal internal assessments, evaluations of drills and exercises, and external assessments. Collectively, the assessment program (as applied to emergency management) has several positive attributes. Internal emergency preparedness assessments, which are required annually by the master audit plan, are conducted by the FM&T Surveys and Assessments Department, thus providing the FM&T emergency management coordinator with an independent perspective of the program. The KCP Emergency Plan serves as the source of emergency management programmatic requirements, and the process for preparing, conducting, and documenting internal assessments is generally defined and controlled by a process description and associated work instructions. The May 2001 internal audit appropriately reviewed a range of programmatic elements identified in the KCP Emergency Plan, including command media applicable to the emergency management program, emergency response organization cadre training status, and the drill and exercise program. There were also two external audits in calendar year 2000 in the emergency preparedness area. In addition, drills and exercises are clearly used to identify improvement items, which are typically addressed by the time the drill/exercise reports are issued.

Notwithstanding the large number of KCP emergency preparedness assessments conducted in the past several years, process weaknesses limit their effectiveness as improvement mechanisms. In the case of the 2001 emergency preparedness annual internal assessment, the auditor had not assessed this area previously and is not an emergency management subject matter expert. Although the auditor carefully followed the prescribed preparation process, the absence of pre-determined evaluation criteria specific to the emergency management area, combined with the auditor's inexperience in the emergency management area, precluded the identification of several weaknesses identified by the OA team. The lack of pre-determined evaluation criteria also limits the ability to consistently conduct effective assessments from year to year using different evaluators. Finally, external auditors, who were apparently not familiar with the DOE emergency management system, did not consider the range of

accidents that would be appropriate for evaluation within the HA as it relates to identifying and communicating protective actions to site neighbors.

## F.2.3 Issues Management

As described in the "Feedback and Improvement" section of Volume I of this report, the FM&T issues management process generally utilizes the computer-based KCP corrective action tracking system for capturing and tracking issues and their associated corrective actions. However, although a variety of relatively minor emergency management concerns have been identified through drill/exercise evaluations and assessments, only selected emergency management concerns from internal assessments have been entered into the KCP corrective action tracking system over the past several years. This has occurred because several factors significantly limit its use in the emergency management area. Improvement items from drills/exercises, which comprise the bulk of the identified concerns, do not meet the entry thresholds identified in the applicable corrective action and lessons-learned procedures. In addition, because (a) no significant weaknesses have been identified and (b) improvement items identified during drills/exercises are corrected almost immediately thereafter, formal systematic tracking has not typically been considered to be of value. Furthermore, the identification of "incidental" assessment findings for entry into the corrective action tracking system is left to the discretion of the assigned auditor. Consequently, OKCSO and FM&T staff are unable to readily trend long-term performance in the emergency management area.

## F.3 Conclusions

AL-EMB, OKCSO, and FM&T have mechanisms in place to promote continuous improvement in the KCP emergency management program. AL-EMB and OKCSO maintain operational awareness through a variety of line management oversight activities, and FM&T identifies and addresses programmatic weaknesses and improvement areas through annual (internal) assessments and exercises. However, weaknesses were identified in each of these areas, as well as in the tracking and trending of improvement items. These weaknesses limit KCP's ability to identify higher-significance concerns and to continue to improve the effectiveness of the program.

## F.4 Rating

The feedback and continuous improvement programs used by OKCSO and FM&T, as applied to the emergency management area, are consistent with the industrial-standard-based program that is described in the KCP Emergency Plan. A rating of EFFECTIVE PERFORMANCE is therefore assigned.

## F.5 Opportunities for Improvement

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

### OKCSO

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

- Establish a role for the OKCSO emergency management specialist as an active participant in assessments of the KCP emergency management program by AL-EMB.

### FM&T

- Consider modifying the current corrective action tracking system to facilitate documenting, tracking, and trending emergency management program weaknesses and improvement items in order to better identify positive and adverse performance trends.
- Consider developing programmatic evaluation criteria, based on those found in the “Evaluations” (draft) volume of the emergency management guide that accompanies DOE Order 151.1A, for use by internal and external auditors who are unfamiliar with the DOE emergency management system.

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