

Office of Independent Oversight and Performance Assurance
Office of Security and Safety Performance Assurance
U.S. Department of Energy

Inspection of
Emergency Management
at the

Hanford Site

May 2004



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Abbreviations Used in This Report

BED	Building Emergency Director
DOE	U.S. Department of Energy
EAL	Emergency Action Level
EDO	Emergency Duty Officer
EM	DOE Office of Environmental Management
EOC	Emergency Operations Center
EPPM	Emergency Preparedness Program Manager
ERO	Emergency Response Organization
FHI	Fluor Hanford, Inc.
IC	Incident Commander
OA	Office of Independent Oversight and Performance Assurance
RL	Richland Operations Office
WRAP	Waste Receiving and Packaging (facility)

OVERSIGHT

The Secretary of Energy's Office of Independent Oversight and Performance Assurance (OA), within the Office of Security and Safety Performance Assurance, conducted an inspection of the emergency management program at the U.S. Department of Energy (DOE) Hanford Site in April 2004. The inspection was performed by the OA Office of Emergency Management Oversight.

The DOE Office of Environmental Management (EM) is the lead program secretarial office for Hanford. As such, it has overall Headquarters responsibility for programmatic direction and funding of most site activities, including emergency management. Line management responsibility for the operation of the Hanford Site falls under the Richland Operations Office (RL) and the Office of River Protection, both of which report directly to EM. RL is responsible for the operation of the Hanford Site, excluding the tank farms and the Pacific Northwest National Laboratory, and is responsible for the overall management, direction, and control of all emergencies at the Hanford Site not involving the tank farm. The Office of River Protection is responsible for managing all aspects of tank waste remediation systems, including overall site response to emergencies occurring at the tank farm. The Pacific Northwest Site Office, which reports directly to the Office of Science, is responsible for providing overall programmatic direction to the Pacific Northwest National Laboratory, which is a multi-program national laboratory having both private and government facilities. For emergency management purposes, the Pacific Northwest National Laboratory, which is located in the 300 Area of the Hanford Site, is considered as a set of facilities that is required to operate within the same emergency planning and response framework as other Hanford facilities. Under contract to RL, Fluor Hanford, Incorporated (FHI) is the prime contractor within the Project Hanford Management Contract, which is the contract vehicle for performing site cleanup. FHI is also responsible for the development and administration of such emergency preparedness elements as

incident response (fire and security), training, and emergency operations center management and staffing. CH2M Hill Hanford Group is the prime contractor to the Office of River Protection for tank farm management; Battelle Memorial Institute operates Pacific Northwest National Laboratory for DOE.

The original Hanford mission was the production of plutonium for national defense. The current mission focuses on environmental restoration, including cleanup of contaminated soil, groundwater, and inactive nuclear facilities; waste management, including the storage and processing of high-level radioactive waste contained within the tank farms; and related scientific and environmental research. These activities involve various forms of radiological and chemical hazardous materials that are present in significant quantities and that need to be effectively controlled.

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

In addition to the OA review of RL's emergency management oversight and operational awareness activities, the inspection team conducted tabletop performance tests with a sample of the site's key emergency response decision-makers to evaluate their ability to employ available procedures, equipment, and skills when responding to postulated emergency conditions.

This inspection focused on the performance of the emergency response organization and the execution of oversight responsibilities by DOE line

management, but the inspection results also provide insights into the effectiveness of several key program elements, such as plans and procedures, training, and drills. The inspection at Hanford does not include a detailed evaluation of all required program elements delineated in DOE Order 151.1B, *Comprehensive Emergency Management System*; consequently, the conclusions drawn regarding the status of the program are necessarily based in large part on the various perspectives provided by the process by which the performance tests are planned, conducted, and evaluated. DOE line management should further evaluate the insights that are identified in this report in developing root causes and corrective actions for the inspected areas, as warranted.

Section 2 of this report provides an overall discussion of the results of the review of the Hanford emergency management program elements that were evaluated. Section 3 provides OA's conclusions regarding the overall effectiveness of RL 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 finding that requires corrective action and follow-up. Appendices C and D detail the results of the reviews of individual emergency management program elements.

2.0 Results

2.1 Positive Program Attributes

RL and FHI are maintaining a mature emergency management program that facilitates an effective response to a wide range of potential events. Positive attributes of the Hanford emergency management program are discussed below.

Key emergency response decision-makers at the facility level and in the emergency operations center (EOC) performed effectively during tabletop performance tests. For postulated events at the waste receiving and packaging (WRAP) facility, incident commanders demonstrated a thorough understanding of emergency operations under unified command. Within the EOC, the actions of the FHI site management team and the RL policy team were effectively coordinated. With few exceptions, such response tools as the patrol operations center quick response checklist, which is used to rapidly implement onsite protective actions, and other response procedures and checklists ensure that required actions are accomplished accurately and in a timely manner. Consequently, in most cases, decision-makers at the facility level and within the EOC demonstrated accurate and timely decision-making in the key areas of event classification, protective action identification and implementation, and notification. Furthermore, RL demonstrated effective oversight of the contractor response organization and ensured that appropriate attention was paid to offsite interfaces and the issuance of emergency press releases.

RL is actively engaged in line management oversight of the Hanford emergency management program. The RL emergency preparedness program manager participates in frequent, regularly-scheduled meetings with the primary site contractor and other site organizations to discuss the status of corrective actions, sitewide issues, lessons learned, and accomplishments. This individual is also involved in various aspects of the process for planning and

conducting exercises, such as reviewing and approving exercise objectives. As a result of the program manager's involvement in the corrective action closure process, closure actions are generally thorough and well documented. Finally, RL has ensured that a comprehensive emergency public information program and associated implementation procedures have been established.

2.2 Program Weaknesses and Items Requiring Attention

Although RL emergency response decision-makers performed effectively during tabletop performance tests, weaknesses were identified in the rigor of the RL training and qualification program. Concerns in the process for scheduling and conducting line management assessments of the site emergency management program were noted as well. Specific weaknesses are discussed below.

The RL program for training and qualifying the RL emergency managers and senior managers on call does not ensure that qualified personnel are available to fill the required positions. Currently, only one individual is qualified to assume the role of the RL emergency manager, although RL has indicated that other senior responders from the Office of River Protection may be called upon to fill this position, if necessary. The RL senior managers on call are authorized to act as the RL emergency manager until relieved by a qualified RL emergency manager, but the RL senior managers on call are not required to demonstrate their competence in a drill or exercise prior to being placed in the on-call rotation. Furthermore, the training required for the RL emergency manager and senior manager on-call positions does not include all the topics with which they must be familiar to perform the job. For example, although the RL emergency manager is responsible for approving an upgrade in an event classification from the EOC, no classroom or practical training is provided in using the emergency action levels.

EM and RL have not developed a strategy for ensuring that the Hanford emergency management program is appropriately implemented and maintained. Historically, EM has periodically reviewed various aspects of the site program to fulfill its responsibilities that are assigned by DOE Order 151.1B for ensuring implementation of an emergency management program consistent with the Department's policies and requirements. Similarly, RL has in the past conducted comprehensive, well-documented programmatic assessments at the required frequency, the most recent of which was conducted in 2002. However, the only assessment conducted by DOE in 2003 was a narrowly focused assessment of

RL line management oversight by EM. Additionally, the assessment schedule calls for an assessment of all but one of the site contractor programs in 2004 and 2005, but the resources previously available to the RL emergency preparedness program manager for conducting assessments are no longer available. Finally, neither EM nor RL have developed and documented a strategy for conducting the necessary assessments to ensure that all elements of the site's emergency management program are evaluated at the required frequency. This represents a future potential vulnerability in maintaining program quality, particularly in light of the recent losses of RL and EM personnel who have significant emergency management expertise.

The August 2001 OA inspection of the Hanford emergency management program found that the program was comprehensive, thoroughly documented, and well integrated. Although some weaknesses were identified at the time, the Hanford Site emergency management program provided confidence that site workers and the public could be protected in the event of a hazardous material release. This limited-scope inspection reaffirmed that RL and FHI are maintaining a generally-effective program. RL is actively engaged in maintaining a high degree of operational awareness of the status of the program, as demonstrated by the frequent interactions of the RL emergency preparedness program manager with FHI staff, and his direct involvement in corrective action status meetings, drill and exercise development, and corrective action closure activities. RL is also ensuring that key program functions, such as the emergency public information program, are being effectively maintained. Furthermore, with few exceptions, RL and FHI emergency responders at the facility level and within the EOC demonstrated effective decision-making, during tabletop performance tests, in the key areas of event classification; event notifications; and most importantly, identification and implementation of protective actions for site workers and protective action recommendations for the public.

The OA team identified several weaknesses related to RL's role in ensuring the effectiveness of the overall site program and overseeing the site's response to an emergency event. The last comprehensive programmatic assessment was conducted by RL in 2002, and EM's last assessment, conducted in 2003, was limited to reviewing RL line management oversight. However, the published RL assessment schedule indicates that all but one of the site contractor

programs will be assessed in 2004 and 2005, but the RL emergency preparedness program manager no longer has access to resources that in past years were used for such activities. Additionally, because neither EM nor RL have developed and documented an approach for conducting line management oversight of the Hanford emergency management program, it is unclear how EM and RL will in the future ensure the continued effectiveness of the program. The absence of a well-considered, documented approach is exacerbated by recent turnover in emergency management personnel within EM and RL.

RL also provides key emergency response personnel to manage and assist the site's response to an emergency event. RL staff performed well during tabletop performance tests. However, RL currently has only one qualified emergency manager, and although the RL senior managers on call are responsible for acting as the RL emergency manager until relieved, their qualification program does not include any demonstration of their ability to fill this key role before being assigned to the on-call rotation. Furthermore, the training provided to RL emergency managers and senior managers on call does not contain information that addresses event classification or the identification of offsite protective action recommendations, which are key responsibilities assigned to this position.

Overall, the Hanford emergency management program is mature, and the concept of emergency operations is sound. Consequently, RL and contractor emergency responders are generally prepared to respond effectively to an emergency event to protect site workers and the public. DOE line management attention is warranted to ensure that the current challenges to EM and RL in maintaining an effective program are appropriately addressed so that the site's response posture remains strong.

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4.0 Ratings

This inspection focused on a detailed assessment of two key emergency management programmatic elements. No overall program rating has been assigned. The individual element ratings reflect the status of each Hanford emergency management program element at the time of the inspection. The ratings assigned below to the DOE line program management category are specific to those assessment, corrective action, and performance monitoring mechanisms applicable to the emergency management area.

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

Emergency Response

Hanford Emergency Response Decision-Making EFFECTIVE PERFORMANCE

DOE Line Program Management

DOE Line Program Management EFFECTIVE PERFORMANCE

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APPENDIX A

SUPPLEMENTAL INFORMATION

A.1 Dates of Review

Scoping Visit	April 6 - 7, 2004
Onsite Inspection Visit	April 19 - 26, 2004
Report Validation and Closeout	May 19 - 20, 2004

A.2 Review Team Composition

A.2.1 Management

Glenn S. Podonsky, Director, Office of Security and Safety Performance Assurance
Michael A. Kilpatrick, Director, Office of Independent Oversight and Performance Assurance
Charles B. Lewis, Director, Office of Emergency Management Oversight
Steven C. Simonson, Deputy Director, Office of Emergency Management Oversight (Team Leader)

A.2.2 Quality Review Board

Michael A. Kilpatrick
Dean C. Hickman
Robert M. Nelson

A.2.3 Review Team

Steven Simonson, Team Leader
JR Dillenback
David Odland
David Schultz

A.2.4 Administrative Support

Debby Hanson

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APPENDIX B

SITE-SPECIFIC FINDINGS

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

FINDING STATEMENTS	REFER TO PAGES:
1. The RL emergency preparedness training program does not ensure that RL emergency managers and RL senior managers on call are fully prepared to fulfill their assigned responsibilities for event classification and protective action decision-making, as required by DOE Order 151.1B, <i>Comprehensive Emergency Management System</i> .	22

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APPENDIX C

EMERGENCY RESPONSE

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

Most of the information provided in this section is based on observations from two sets of tabletop performance tests conducted by the Office of Independent Oversight and Performance Assurance (OA). The first set of performance tests involved two emergency response decision-making teams from the waste receiving and packaging (WRAP) facility, each consisting of a building emergency director (BED), fire and security incident commanders (ICs), and selected support staff. The second set of performance tests involved two emergency operations center (EOC) teams, each consisting of an emergency duty officer (EDO) – who subsequently becomes a member of the EOC support staff – a Richland Operations Office (RL) emergency manager, a Fluor Hanford, Inc. (FHI) site emergency director, and selected EOC support staff. In addition, interviews were conducted with two BEDs from the central waste complex, a facility adjacent to the WRAP facility that performs storage functions for WRAP-processed material.

Collectively, three operational emergency scenarios were presented to the participants: a malevolent act with a potential bomb explosion and release of radioactive material; a WRAP facility glovebox fire/explosion that produces a release of radioactive material; and a vehicular accident involving an injured person and the release of a hazardous chemical. The scenarios, which were developed by OA in conjunction with an FHI trusted agent, were presented to the participants by FHI trusted agents to ensure scenario validity and delivery of accurate event cues; the trusted agents also played the roles of the ICs and EOC positions not staffed.

C.2 Status and Results

In the event of an emergency, initial direction and control of the FHI emergency response organization (ERO) is provided by the facility BED (for facility-specific events), or the Hanford fire department and security ICs and FHI EDO (for site events). These individuals are supported by personnel in the patrol operations center and occurrence notification center, which are staffed 24 hours per day. Depending on the event location, either the BED or the IC and EDO perform protective action decision-making, emergency classification, and notifications until relieved by the FHI site emergency director as part of the EOC activation process. ICs from the fire department and the security organization join the BED at the facility, and depending on the type of emergency, a designated IC relieves the BED of command and control functions and leads the on-scene response. The IC directs the tactical response, while the BED retains facility operational control through unified incident command. For such site events as transportation accidents, the IC performs initial protective action decision-making; the EDO identifies additional required protective actions, classifies the event, and initiates notifications, which are actually conducted by the occurrence notification center.

After the EOC is activated, the site emergency director assumes overall strategic response and relieves the IC or EDO of certain duties, including classification changes, and formulation of onsite protective actions away from the scene and offsite protective action recommendations. As discussed in more detail in Appendix D, the RL emergency manager is responsible for the adequacy of the overall response, final approval of protective action recommendations, and notifications and communications with offsite authorities. The emergency manager may assume command and control for any event, particularly security events.

C.2.1 WRAP Event Response Team

The BEDs, leading the plant response teams, clearly understood their roles as the initial decision-makers, and when joined by fire and patrol ICs, quickly established an effective unified command system with division of duties assigned to the cognizant commander. Within the unified command arrangement, the Hanford

patrol shift commanders effectively established overall command and control for the security event, while the fire department battalion chiefs similarly led the response to the facility glovebox fire event. After relief of incident command, the BEDs managed plant process system operations, keeping the ICs appropriately informed. Overall, the actions of the response teams were effectively coordinated and implemented under the scenarios presented during the performance tests.

After receiving indications of a facility emergency, response team members quickly assembled at the designated incident command post, which was equipped with appropriate procedures and such supporting equipment as facility diagrams and site maps, and began implementing checklists to orchestrate the response. Following assessment of facility conditions, the BEDs, using the public address system, instructed other facility personnel to implement protective actions in areas away from the event scene. The communicators immediately initiated a 911 call to back up the fire alarm and summon additional response assets, and alerted the occurrence notification center that off-normal events were in progress. Team member interactions facilitated an effective response. For example, one BED misinterpreted wind direction and began to implement an incorrect approach path for the responders, but two team members noted the error within moments and it was corrected immediately. Facility personnel attempting to mitigate the effects of the event demonstrated a thorough understanding of the facility systems. With facility personnel protected by sheltering actions, and additional resources en route, the BEDs directed their attention to emergency classification and notifications. The initial emergency classifications were performed accurately and in a timely manner; notifications were initiated shortly thereafter. Command post communicators entered as much information as possible onto the notification forms before the emergency declarations, thereby minimizing the time necessary to initiate the notifications after the event was classified.

After the fire and patrol ICs arrived at the incident command post, the BEDs provided a comprehensive briefing concerning the status of the facility, protective actions, injuries, and other pertinent information. The ICs and BEDs quickly determined which IC should take command and control based on the event initiator, and the shift of command and control was made apparent to the incident command staff. Both ICs implemented appropriate response actions, such as reviewing protective actions already implemented, balancing the priority for care of injured personnel

against decontamination prior to transport, and obtaining support from such additional resources as the canine and explosive ordnance disposal units. The ICs conducted periodic briefings to bring response personnel up to date and to set priorities on such required actions as relocating evacuees due to their proximity to the scene of a potential explosion.

Two weaknesses were noted in the processes employed by the BEDs for determining protective actions and for classifying the postulated bomb threat. Because the BEDs have not been provided procedural guidance for establishing an initial isolation zone in response to credible bomb threats, both BEDs initially evacuated the WRAP facility to the primary staging area, which is a parking lot immediately adjacent to the facility, and which was downwind for the scenario. After several minutes, incident command staff recognized the vulnerability of this exposed location, and the BEDs ordered evacuees to take cover in the WRAP support building. The Hanford Patrol ICs subsequently determined that this location was too close to the WRAP facility based on their explosives protection guidance; consequently, the evacuees were moved to a more suitable location. Providing procedural direction to the BEDs for appropriate standoff distances for credible explosive threats would ensure that the initial protective actions are adequate until the appropriate experts complete a further evaluation.

Another weakness involves potential ambiguity in the WRAP security emergency action levels (EALs). Following the confirmation of the presence of explosives in the WRAP facility by canine units during the postulated bomb threat scenario, the BEDs upgraded the classification to a Site Area Emergency. The EALs for security contingencies dictate that after such a confirmation, a General Emergency (which would also require protective action recommendations to offsite authorities) should be declared if radiological material in a waste storage area is involved. The response team discussions included the quantity and type of radiological material at risk within the WRAP facility and the extent of the probable damage, but the more severe, more appropriate declaration was not made. Furthermore, during interviews, two central waste complex BEDs were presented the same event cues and both similarly classified the event as a Site Area Emergency rather than a General Emergency. These misclassifications were likely due to the fact that unlike the “fire/explosion” EALs, which contain specific material-at-risk quantities, the security contingency EALs for both WRAP and the central waste complex do not include easily-discernable thresholds for differentiating between

a Site Area Emergency and General Emergency classification.

C.2.2 EOC Teams

The site management team, which is co-located in the EOC with the RL policy team (discussed in Appendix D) and headed by the FHI site emergency director, provides necessary resources to the IC; performs consequence assessment; implements onsite protective actions away from the event scene; assumes classification authority from the BED or EDO; and develops protective action recommendations for transmittal to offsite agencies after approval by the RL emergency manager. EOC staff members effectively utilized appropriately-detailed procedures and checklists in support of these respective functions. The actions of the policy and site management teams were effectively coordinated, with the policy team actively overseeing the site's response activities. The site emergency directors conducted periodic, detailed briefings that ensured that EOC staff remained abreast of the progression of events and the status of response actions.

EDOs and EOC staff were proficient at event assessment and were familiar with EAL thresholds for making emergency classifications. EDOs immediately assessed the consequences of the transportation event as an extreme inhalation hazard and recognized that the postulated stable meteorological conditions would cause an adverse impact to affected populations. Both EDOs appropriately concluded within several minutes that the event conditions, together with the event location reported from the field by the IC, constituted a General Emergency. For the postulated WRAP facility glovebox fire, the EOC staff immediately recognized the significance of the event as it related to the impact on the proper functioning of facility safety systems to mitigate consequences of the event and prevent release to the environment. Several EOC staff members properly questioned the adequacy of initial decision-making by facility responders to ensure that the initial event assessments were adequate, and EOC staff correctly concluded that the initial responses were in accordance with procedures. EOC staff promptly confirmed the accuracy of the initial Alert declaration made by the WRAP facility BED, and after receiving additional plant status information signifying further facility degradation, the EOC appropriately upgraded the event classification to a Site Area Emergency, with the concurrence of the RL emergency manager. Furthermore, EOC personnel ensured that event

notifications were completed within minutes after emergency classification changes.

In most cases, protective actions were formulated and implemented in a manner that protected workers and the public. A conservative set of protective actions has been predetermined for each declared emergency; therefore, affected site personnel should be appropriately protected if the event classification is performed correctly. For example, when the EOC upgraded the classification of the WRAP facility glovebox fire to a Site Area Emergency, onsite affected areas were sheltered, onsite road blockades were established, and river areas and roads accessible to the public (but on U.S. Department of Energy [DOE] property) were closed. Additionally, warning messages for sheltering actions included instructions for closing doors and windows and securing ventilation. Emergency response decision-makers remained aware of protective actions that were ordered, and in one case, the site emergency director stopped an order to evacuate until the effects of a wind shift could be reassessed and assembly areas established for accountability purposes and medical monitoring. The site management team did not always proactively seek the ongoing status of implementation of protective actions; however, this information should be forthcoming during an actual event based on the responsibilities of EOC staff who were not included in the performance tests.

The OA team noted two response weaknesses. During the vehicular accident scenario one of the EDOs did not demonstrate a sense of urgency after recognizing that the event was a severe release of a hazardous chemical, as demonstrated by the fact that 18 minutes were required to confer with the IC and then formulate and direct implementation of protective actions. This was twice the time required by the other EDO to accomplish the same tasks. As a result of the additional delay, the hazardous portion of the postulated chemical plume would have traveled to a point near the northern boundary of the 300 Area by the time the EDO initiated the process to shelter personnel in the 300 Area. The second weakness involves incorrect use of the 2000 Emergency Response Guide by both EDOs to obtain protective action distances. Although the EDOs recognized the significance of stable meteorological conditions, they did not expand to 4.2 miles the initial downwind protective actions of 1.7 miles that were selected from the Emergency Response Guide by the scene ICs, who had mistakenly chosen a set of non-conservative protective actions that were drawn from the "Day" column (i.e., non-stable

meteorological conditions). Instead, the EDOs increased the initial protected distances from 1.7 miles to 2.2 miles based on predetermined demographic areas where protective action orders can be readily implemented. Although the revised protective action distance of 2.2 miles did not initially ensure that affected population groups were adequately protected, the error was mitigated by the conservative nature of the Emergency Response Guide and the specific characteristics of the scenario. A subsequent quantitative dispersion analysis depicted an area of consequence for the event of approximately 1.8 kilometers, which was well within the protected area established by the initial EDO decision-making.

Additionally, several weaknesses in the content and use of the Hanford emergency notification form detracted from the overall accuracy of the notification process. For example:

- For a transportation-related release event, one EDO described the protective action recommendation only as “evacuate 2.2 miles,” and did not indicate the center of the evacuation zone or identify whether the affected area was circular or a downwind sector.
- Although alphanumeric sectors based on demographic boundaries have been established with offsite authorities for implementing protective actions, for the same transportation-related event, another EDO documented the protective action recommendation as “evacuate 2.2 miles in accordance with 300 Area PAs.” Given the absence of applicable sector designators or any reference to the 300 Area emergency planning zone, this description was not sufficiently specific to ensure that offsite agencies understood the affected areas.
- One EDO did not check the appropriate emergency classification block (i.e., General Emergency), and the classification severity was not otherwise indicated on the form. The significance of this error is diminished by the fact that the occurrence notification center operator may detect this type of error during a quality control review before transmittal.
- The Hanford emergency notification form does not include an area for describing the onsite protective actions, and an alternate mechanism for providing

this information to offsite authorities (which includes DOE Headquarters) as part of the initial notification process has not been developed. Information regarding onsite protective actions is necessary to support higher decisions within DOE to activate the Headquarters emergency management team. Furthermore, the effectiveness of the EOC consequence assessment staff could have been enhanced by including the protective actions on the form, because this information was not otherwise readily available early in the event sequence.

Finally, some of the EALs applicable to the EOC performance tests exhibited weaknesses in clarity or content. In an effort to avoid unnecessary event classification, the site classification procedure requires that “generic” (i.e., discretionary) EALs should be used only when an EAL event category is not available. This restriction on the use of discretionary EALs is inconsistent with the statement, also contained in the classification procedure, that classifying authorities should use their discretion in making correct emergency classifications. The restriction can be particularly problematic for the event classifier should an event such as a facility fire occur, which may fall within an available EAL event category, but for which an Alert-level EAL has not been developed. If the event causes the classification decision-maker to believe that an event declaration is warranted due to a significant threat to the integrity of a facility, then the decision-maker should not be categorically precluded from taking advantage of the very process that has been established for rapidly obtaining a suite of response assets and additional technical support.

Another EAL weakness concerns the transportation event EALs, which require that a General Emergency be declared if an event that occurs south of the Wye barricade requires protective actions at distances greater than one kilometer. However, DOE Order 151.1B only requires a General Emergency declaration when protective action criteria are exceeded beyond the site boundary. As a consequence of the “one kilometer” provision, combined with the fact that large areas south of the Wye barricade are still relatively distant from the site boundary, a General Emergency would be unnecessarily declared, rather than the more appropriate Site Area Emergency, for transportation events whose protective action distances exceed approximately 100 meters from the event but do not extend to the site boundary.

C.3 Conclusions

During tabletop performance tests, Hanford emergency responders demonstrated the ability to quickly assess events, formulate and implement protective actions for affected population groups, and promptly notify onsite and offsite authorities. Effective coordination among facility responders and security and fire department ICs mitigated the consequences of the postulated events. EOC staff accurately reviewed initial facility decision-making and confirmed that sound strategies were being implemented for the protection of personnel, property, and the environment. During all of the performance tests, the responders used a comprehensive set of procedures and checklists to orchestrate a successful response. However, some procedural and implementation concerns related to classification EALs, notifications, and the use of the Emergency Response Guide for selecting protective actions could impact the accuracy and timeliness of tasks involving these elements. During performance tests, EALs were not always interpreted accurately, and the formatted notification message form did not always accurately convey the required information. Accurate and timely assessment of site events through improved application of procedures and tools such as the 2000 Emergency Response Guide would ensure that off-normal events are appropriately mitigated. Overall, notwithstanding the identified concerns, facility and EOC response teams effectively demonstrated that the Hanford response mechanisms can protect the health and safety of workers, the public, and the environment.

C.4 Rating

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

C.5 Opportunities for Improvement

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

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- Improve the ability of key emergency response decision-makers to accurately and consistently classify event severity by strengthening sitewide and facility EALs and improving their usability in a high-stress environment. Specific actions to consider include:
 - Review site and facility EALs to ensure that they possess the characteristics that are discussed in the Emergency Management Guide (DOE Guide 151.1-1), such as use of reliable indicators and internal consistency. For example, measurable, objective criteria should be incorporated into the EALs whenever possible, particularly if such event-related thresholds as “fuel pool level” are included in the associated emergency planning hazards assessment. Different events of a similar severity (e.g., WRAP fire/explosion and a security event involving a bomb threat) should result in the same classification.
 - Revise the transportation-related EALs to permit correlating the severity of the event classification with the predicted or actual distance from the event location that the protective action criteria are met. Ensure that the EALs align with the classified emergency definitions used in DOE Order 151.1B.
 - Consider clarifying or modifying the direction provided in the event classification implementing procedure for utilizing generic (i.e., discretionary) EALs when decision-makers cannot apply event-specific EALs.
- Implement program enhancements to improve the accuracy and timeliness of offsite notifications. Specific actions to consider include:
 - Provide a desktop check sheet in quick review format to permit the occurrence notification center operator to perform a quality check of data entries on the Hanford emergency notification form.
 - Modify the notification form to include protective actions that have been ordered and implemented on the Hanford Site so that this

information will be provided to EOC functional groups and offsite authorities without further communication requirements.

- Issue offsite protective action recommendations in a format that can be easily and readily understood by notification recipients, such as identifying affected sectors through alphanumeric numbering.
- Strengthen the processes for protective action decision-making at the event scene, facility, and sitewide levels. Specific actions to consider include:
 - Incorporate isolation zones where applicable (such as confirmed explosive threat) into functional position checklists or other appropriate procedures.

- Provide additional training for ICs, BEDs, and EDOs on the use and implementation of the 2000 Emergency Response Guide to facilitate the establishment of protective isolation zones around and downwind of a hazardous material release that are best suited to the existing meteorological conditions.
- Conduct performance tests for key initial decision-makers at a frequency that ensures that for time-urgent event scenarios, procedure-driven response actions can be accurately performed and protective actions can be accurately formulated and implemented in a high-stress environment.

APPENDIX D

DOE LINE PROGRAM MANAGEMENT

D.1 Introduction

Management of a site's emergency management program by DOE line managers includes elements of readiness assurance as well as the performance of some emergency planning, preparedness, and response functions. Ultimately, readiness assurance activities ensure that emergency management program plans, procedures, and resources will facilitate an effective response to an emergency at the Hanford Site. Key elements of the readiness assurance program for U.S. Department of Energy (DOE) field elements include active involvement in monitoring program effectiveness for both contractor and DOE responsibilities; timely implementation of corrective actions for identified weaknesses; and the incorporation of lessons learned from training, drills, exercises, or actual events. DOE field elements also have direct responsibility for performing some emergency response activities, primarily oversight of the site's emergency response and activities related to the release of emergency public information to site workers and the public.

This inspection examined the processes by which the DOE Office of Environmental Management (EM) and the Richland Operations Office (RL) provide guidance and direction for and maintain operational awareness of the Hanford Site emergency management program. Also evaluated were those aspects of emergency preparedness and response for which RL is responsible.

D.2 Status and Results

D.2.1 DOE Monitoring of Contractor Performance

DOE Order 151.1B assigns line management oversight as well as various emergency response roles to cognizant DOE Field and Headquarters elements. For the Hanford Site, the Department's emergency management responsibilities are divided almost exclusively between RL and EM. At the site level, line responsibility for Hanford's emergency management program falls under RL. Within RL, the Security and Emergency Services directorate has delegated responsibility for providing overall emergency

management program guidance and oversight for the Hanford Site, including the tank farm (through the Office of River Protection) and the Pacific Northwest National Laboratory (through the Pacific Northwest Site Office), to the RL emergency preparedness program manager (EPPM). The RL EPPM is supported by the Office of River Protection and the Pacific Northwest Site Office, as requested, in providing line management oversight of emergency management program implementation at the tank farm (by CH2MHill) and Pacific Northwest National Laboratory (by Battelle Memorial Institute), respectively. RL reports directly to EM, which is the cognizant secretarial office for the Hanford Site. EM's Office of Safeguards, Security, and Emergency Management (EM-3.1), through the EM emergency management team leader, is responsible for monitoring the status of emergency management programs at all EM sites. RL and the Pacific Northwest Site Office are working under an interim agreement to maintain the previous set of emergency management roles and responsibilities. Consequently, the Office of Science currently has no substantive emergency management responsibilities for the Hanford Site.

As the cognizant secretarial office, DOE Order 151.1B requires EM to ensure that the Department's emergency planning, preparedness, and response policies and requirements are implemented and maintained for the Hanford Site. The EM emergency management team leader fulfills these responsibilities through periodic assessments of RL's ability to conduct effective line management oversight of the Hanford emergency management program; various interactions with the RL EPPM; and review of the Hanford emergency readiness assurance plan. For example, in June 2003, EM conducted a focused assessment to determine the adequacy of oversight that RL provides for the Hanford contractor emergency management programs, as well as to verify the closure of emergency management corrective actions identified by Independent Oversight in August 2001. The assessment plan and report were comprehensive, and the EM team concluded that RL had provided effective emergency management oversight of the Hanford Site in such areas as integration of Hanford contractors; review and approval of emergency planning hazards assessments; and tracking and closure of corrective

actions. The EM Headquarters emergency management plan provides the framework through which EM responds to a Hanford incident, and defines EM response roles. This plan is primarily a response document and, as such, does not include expectations for how to accomplish DOE line management oversight of the site's emergency management program; discussion of related EM team leader responsibilities; or direction regarding the coordination of assessment scheduling and reporting with operations offices, such as RL.

The RL EPPM has primary responsibility for providing line management oversight of the Hanford emergency management program. This function includes assessing all elements of the site's emergency management program at least once every three years; developing the annual emergency readiness assurance plan; developing and conducting training and exercises for RL emergency responders; and coordinating emergency resources. These roles and responsibilities are clearly documented in the Hanford emergency management plan, and the RL program manager is supported in these efforts by a small cadre of designated contractor personnel. Noteworthy oversight activities include participating in the quarterly Emergency Preparedness Council meetings, during which sitewide issues and lessons learned from drills and exercises are discussed, and ongoing coordination of sitewide emergency preparedness activities. Additionally, the RL EPPM conducts weekly staff meetings where the status of corrective actions related to the emergency preparedness program that are being tracked through the RL-specific information tracking system is discussed. The RL EPPM is supported in his efforts by the RL issues management process, which includes a corrective action tracking system independent of that of the primary site contractor for tracking deficiencies and weaknesses identified during exercises and OA inspections. The RL EPPM meets regularly with site contractors to discuss the status of their emergency preparedness programs, and he is also involved in various aspects of the process for planning and conducting exercises, such as reviewing and approving exercise objectives.

Another RL responsibility is to ensure that the site has implemented processes for releasing accurate and timely information to site workers and the public following an emergency event. The RL emergency public information program is appropriately defined by the applicable section of the Hanford emergency plan and is implemented in a framework of supporting procedures that provides the details for coordinating

personnel, resources, and facilities. The plan and procedures include useful templates for facilitating the timely development and issuance of news releases; the clear designation of the individuals authorized to approve the release of information to the public; and provisions to activate the joint information center and coordinate emergency public information efforts with Federal, State, and local organizations. Two weaknesses noted by the OA team in this area are that there is no requirement or expectation within the Hanford emergency public information program that the initial news release be issued within approximately one hour of the event occurrence, and there is no documented process for issuing a timely news release during off-hours or other circumstances where activation of the joint information center may be delayed.

Several other weaknesses related to the conduct of line management oversight were noted as well. The RL corrective action closure process does not provide a mechanism to systematically identify lessons learned from training, drills, exercises, or actual events, as required by the emergency plan. Furthermore, a review of several corrective action closure packages indicates that although most corrective actions were thoroughly documented and effectively incorporated, the closure package intended to address OA concerns from August 2001 regarding EAL technical bases was absent the required subject matter expert verification review, even though the finding was closed in October 2003.

More importantly, RL and EM have not developed a coordinated strategy or methodology for conducting assessments of the site contractor emergency management programs at the frequency required by the Hanford emergency plan and DOE Order 151.1B. During fiscal year 2002, the previous RL EPPM, with support from RL oversight staff, conducted a comprehensive assessment of the Fluor Hanford, Incorporated (FHI) emergency management program. The RL assessment plan and assessment report were comprehensive and based on DOE Order 151.1 guidance criteria. In 2003, the only DOE-conducted assessment of the Hanford emergency management program was the EM assessment of RL line management oversight, discussed above, and for 2004 and 2005, the assessment schedule published in the emergency readiness assurance plan indicates that with the exception of CH2MHill, the other major site contractors will be evaluated. However, since 2002, RL has undergone a series of reorganizations, and RL oversight staff support for emergency preparedness assessments is no longer available. Furthermore, the

position of the RL EPPM recently became vacant, and there was turnover in the position of the EM emergency management team leader at the beginning of the 2004 calendar year. The combination of DOE personnel turnover; the loss of resources within RL for conducting emergency management assessments; and the absence of any guidance or policy documents within EM or RL for the conduct of line management oversight of the Hanford emergency management program places the effective accomplishment of this key responsibility at risk.

In conclusion, RL is actively engaged in providing line management oversight and maintaining operational awareness of the Hanford emergency management program. The RL EPPM monitors the status of contractor programs through frequent interactions and status meetings, and is actively involved in the site drill and exercise programs. The EPPM is also engaged in the issues management process to ensure that issues are adequately identified and addressed by appropriate corrective actions and that corrective actions are tracked, documented, and properly closed. The emergency public information program is well defined and provides direction to staff for accomplishing key tasks, such as developing and reviewing news releases, and coordinating personnel and resources. However, the recent EM and RL reorganization and staff changes, including the loss of the RL EPPM, combined with the lack of a formalized process and resource-driven plan on the part of both EM and RL for scheduling and conducting sitewide assessments, will challenge the ability of RL to maintain the appropriate degree of awareness of the site's emergency preparedness program. Additionally, the processes and procedures governing the emergency public information program do not ensure that the initial news release can be issued within one hour of an emergency event.

D.2.2 DOE Emergency Response

The Hanford concept of emergency operations establishes several key response entities within the emergency operations center (EOC) following an emergency event. The principal organization that involves RL personnel is the policy team, which is staffed by the RL emergency manager, public information director, security director, state and county representatives, and several support personnel. The RL Manager (or designee) serves as the RL emergency manager; this position is designated as having ultimate responsibility and authority for emergency response activities on the Hanford Site. During security incidents,

RL is also responsible for tactical decisions that address mitigation of the security event. This involves direction and control of Hanford Site security and patrol forces and coordination of facility response. The primary functions of the policy team include overview of the onsite response; approval of offsite notifications and protective action recommendations; communication with DOE Headquarters; reclassification of the emergency; direction of joint information center activities; implementation of requests to the regional response coordinator; and liaison with the offsite emergency centers.

In an emergency, the actions of the policy team members are governed by a set of emergency plan implementing procedures that contain brief descriptions of position functions and responsibilities as well as a checklist to guide performance of those functions. During the EOC tabletop performance tests, the OA team observed the execution of the implementing procedures by a subset of the policy team that included the RL emergency manager, security director, and public information director.

Using their checklists and support personnel, the RL emergency managers demonstrated effective oversight of the site management team response, in particular maintaining cognizance over the event classifications, onsite protective actions, and offsite protective action recommendations. The RL emergency managers communicated effectively with the FHI site emergency directors, monitoring the actions and discussions of the site management team and initiating discussions when appropriate. The RL emergency managers were also attentive to their offsite interfaces, including local jurisdictions, headquarters, and regional response coordinator, verifying that offsite EOCs had been contacted and following up on the protective action recommendations.

Also positive was the performance of the RL security directors and public information directors. The security directors demonstrated their ability to provide oversight and coordination of site security force activities and effectively implemented their dual role supporting both the FHI site emergency director and the RL emergency manager. In the scenario that involved a release of a hazardous chemical, both security directors effectively led planning activities for the evacuation of onsite personnel from the affected area, and in the security-related scenario, both directors remained cognizant of the potential security implications of the reported explosion at the affected facility until the situation was resolved. The security director checklist appropriately contains steps dealing with the declaration

of a security event, and subsequent discussions with the security directors indicated that these individuals recognized that there is a change in roles and responsibilities within the emergency response organization (ERO) following declaration of a security event. However, these event-driven changes in the roles and responsibilities within the ERO are not addressed in the emergency response implementing procedure for the RL emergency manager.

The public information directors demonstrated their ability to manage the activities of the joint information center. During each of the scenarios, the public information directors managed the news writer in the preparation, review, and approval of the initial news releases. The scenarios demonstrated that the ERO has implemented an efficient process to develop, review, and release emergency public information in a timely manner, including the effective use of prepared templates for the initial news releases.

Notwithstanding the strong performance of the RL policy team members, the OA team identified two weaknesses in the process for training and qualifying certain key RL emergency responders. During the scenario that involved a release of a hazardous chemical, the RL emergency managers did not clearly understand the extent of the offsite evacuations that had been triggered by the protective action recommendation contained in the initial emergency notification message. In part, this may have been due to weaknesses in the training and qualification program for the RL emergency managers and the RL senior managers on call. Their training program essentially consists of positional and EOC overview training. It does not include instruction on event categorization and classification using EALs or determination of protective action recommendations, all of which are topics with which the RL emergency managers must be familiar to perform effectively. Furthermore, the qualification program for the RL senior managers on call, who assume the RL emergency manager position until relieved by a designated RL manager, does not require that their performance in an emergency exercise or drill be demonstrated prior to being added to the senior manager on-call rotation to ensure that they are fully prepared to assume their assigned duties. Given that RL currently has only one qualified emergency manager, use of one or more senior managers on call during an extended event is highly likely.

Finding #1: The RL emergency preparedness training program does not ensure that RL emergency managers and RL senior managers on call are fully prepared to fulfill their assigned responsibilities for event classification and protective action decision-making, as required by DOE Order 151.1B, *Comprehensive Emergency Management System*.

To summarize, the Hanford emergency plan provides an appropriate overall framework for RL participation in the ERO, and implementing procedures provide adequate instructions to support the RL roles and responsibilities. During tabletop performance tests, RL personnel demonstrated effective oversight of the site response to emergency events, including appropriate attention to offsite interfaces with local agencies, DOE Headquarters, and regional response coordinators, and the ability to provide timely public information. However, weaknesses in the training and qualification of RL emergency managers and senior managers on call may impact their ability to fully execute their position responsibilities.

D.3 Conclusions

RL is actively engaged in providing feedback and direction to the Hanford Site contractors and is maintaining a high degree of awareness of the Hanford Site emergency management program through a variety of activities. During performance tests, RL personnel demonstrated effective oversight of the site's response to emergency events and provided appropriate attention to interfaces with local agencies and DOE Headquarters and the issuance of emergency press releases in a timely manner. Although their performance was generally strong during the postulated events, the training and qualification program for RL emergency managers and senior managers on call does not provide all of the necessary instruction or evaluation to ensure that these responders are fully prepared at all times to perform their assigned duties. Finally, given recent personnel changes, the loss of institutional expertise in EM and RL, and the lack of a clearly defined and well-considered strategy for conducting assessments of the Hanford Site emergency management program, RL's ability to conduct effective line management oversight through the performance of rigorous, well-planned, well-documented, and appropriately-timed assessments of the Hanford Site emergency management program will be challenged. Collectively, these weaknesses do not

substantially detract from the overall effectiveness of DOE's line management oversight of the Hanford Site emergency management program. However, management attention is warranted to ensure that the necessary steps are taken to sustain the program's effectiveness in the future.

D.4 Rating

A rating of EFFECTIVE PERFORMANCE is assigned to the area of DOE Line Program Management.

D.5 Opportunities for Improvement

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

Office of Environmental Management

- Consider revising the EM Emergency Plan, or alternatively, developing a detailed project management plan, to aid in implementing expectations for DOE line management monitoring of the Hanford emergency management program. Specific actions to consider include accounting for all responsibilities assigned by DOE Order 151.1B for conducting line management oversight (at the program secretarial office level) of site emergency management programs, delineating EM emergency management team leader and team member responsibilities, and providing specific direction regarding expectations and processes for conducting the necessary activities.

Richland Operations Office

- Strengthen RL emergency responder training and proficiency elements. Specific actions to consider include:
 - At a minimum, develop a job task and training matrix for the positions of RL emergency manager and senior manager on call. Correlate

each job task with the available training to ensure that these RL responders have received all necessary training to respond effectively to an emergency event.

- Develop initial and refresher proficiency requirements for all RL emergency response positions. Track accomplishment of refresher activities and develop a process that links duty roster content with the status of responder training and proficiency status.
- Devise and implement requirements for demonstration of proficiency prior to being considered “qualified” to ensure effective response by any responder assigned to the duty roster.
- Contact other field office elements to take advantage of “oversight-oriented” training courses for field element emergency responders.
- Develop a detailed assessment process for conducting the required assessments. Specific actions to consider include:
 - Review documentation available on the Richland information management system to identify tasks needed to implement individual requirements, such as developing assessment schedules, assessment plans, evaluation criteria, and reporting mechanisms.
 - Identify the resources needed to complete each action, and for activities that require outside expertise, identify how that expertise will be obtained.
 - Coordinate with EM to establish a schedule and plan for reviewing all elements of the emergency preparedness program (and all site contractors) over a three-year period.
- Review the process for corrective action closure and ensure that discussions, agreements, or subject matter expert reviews that are to be used as the bases for closing corrective actions are documented.

- Review the RL policy regarding the expectations for the timeliness of the initial news release. Specific actions to consider include:
 - Re-evaluate the existing pre-formatted news releases to determine what information should be included in the initial news release to ensure that it can be disseminated within one hour of event occurrence. Consider limiting the content of this release to acknowledgement of the event; activation of response assets; the identification of offsite agencies that have been notified; and indication that further information will be provided when available.
 - Document in an implementing procedure the process for releasing the initial news release during an off-hours event within one hour of the event occurrence.
- Strengthen the ability of the RL policy team and FHI site management team to respond to security events. Specific actions to consider include:
 - Develop specific criteria and guidance on defining and declaring security events and include the guidance in the emergency management plan and implementing procedures. The guidance should recognize that initial responders may declare security events.
 - Provide training for members of the ERO on the strategy, plan, and procedures for addressing a security event.
 - Document in the appropriate emergency plan implementing procedures the actions required to implement the necessary roles and responsibilities during a security event. Include such actions as required notifications, data (i.e., log) entries, and turnover from the site emergency director to the RL emergency manager.