Emergency Management Program Review at the

Waste Isolation Pilot Plant

May 2000

Office of Independent Oversight and Performance Assurance

Table of Contents

Abbreviations Used in This Report

AL	Albuquerque Operations Office
CAO	Carlsbad Area Office
CMR	Central Monitoring Room
DOE	U.S. Department of Energy
EPHA	Emergency Planning Hazards Assessment
EPI	Emergency Public Information
ERDO	Emergency Response Duty Officer
FLIRT	First Line Incident Response Team
FSM	Facility Shift Manager
STEP	States and Tribal Education Program
TRANSCOM	Transportation Tracking and Communication
TRU	Transuranic
TRUPACT-II	Transuranic Packaging Transporter Model II
WID	Westinghouse Waste Isolation Division
WIPP	Waste Isolation Pilot Plant

OVERSIGHT

Executive Summary

EVALUATION:	Independent Oversight Review of the WIPP Emergency Management Program
SITE:	Waste Isolation Pilot Plant
DATE:	May 2000

Scope

The U.S. Department of Energy (DOE) Office of Emergency Management Oversight, within the Secretary of Energy's Office of Independent Oversight and Performance Assurance, conducted a review of the emergency management program at the Waste Isolation Pilot Plant (WIPP) in May 2000. The primary purpose of this review was twofold: to assess selected emergency management system elements that focus on WIPP's readiness to protect site personnel and the public from the consequences of onsite events that may result in the release of hazardous materials; and to evaluate the site's ability to provide appropriate information or assistance in a timely manner to local emergency responders following an offsite event involving a transuranic (TRU) waste shipment to the WIPP site. Also assessed were the emergency response processes by which the public and other stakeholders are kept informed for both onsite and offsite events. In addition, the team examined the effectiveness of the Carlsbad Area Office (CAO) and contractor feedback and continuous improvement processes as mechanisms for identifying, analyzing, and addressing program deficiencies; implementing corrective actions; and demonstrating and verifying the effectiveness of those actions. An assessment of the effectiveness of local agencies in responding to an offsite transportation accident was not included in the scope of this review.

Background

DOE Order 151.1, *Comprehensive Emergency Management System*, provides the framework for the Department's comprehensive emergency management system. This framework includes developing, coordinating, controlling, and directing all emergency planning, preparedness, response, and recovery functions. DOE Field Offices and Headquarters elements are required to develop and participate in this integrated and comprehensive activity. For WIPP, there is an added complexity resulting from the transportation component of the site's mission. Offsite transportation emergency management requires high levels of integration and coordination among the Department; the waste-generating sites; and state, local, and tribal governments along the shipping routes. Because local authorities are responsible for the initial offsite emergency response to incidents involving shipments of TRU waste to WIPP, the Department must be ready to provide the necessary support—both informational and at-scene assistance—to offsite response agencies. For WIPP, the Department's emergency management responsibilities are divided primarily between the site, CAO, and the Albuquerque Operations Office (AL). Each has specific roles, depending on the location and nature of the incident. Therefore, these organizations must ensure that the roles and responsibilities for managing and responding to WIPP-related incidents are clearly defined, and that the mechanisms for their implementation are comprehensive, well-integrated, and formal.

Results

The WIPP project has a unique and long history of actively managing the risk concerns of regulators and the public. Due to a combination of the remote location of the site, the nature of the hazardous materials transported to the site for

disposal, and the robust nature of the containers used to transport the TRU waste, the actual degree of risk to offsite populations from both site operations and offsite transportation activities is relatively low. As a result of the high level of visibility of the national TRU program and its importance to DOE and the nation, WIPP has appropriately spent significant efforts and resources on those aspects of emergency management most closely aligned with the management of public concerns. However, line management has not provided adequate oversight to the entire set of onsite emergency management system elements.

As a result, notable variations exist in the condition of the WIPP emergency management program elements. In general, programmatic elements that are directly related to transportation activities were found to be a strength. The transportation plan is well-conceived and comprehensive, and its provisions, assumptions, and requirements are backed by a set of procedures that direct and control the movement of TRU waste to maintain a high degree of safety. Extraordinary measures have been built into the transportation protocols to ensure that the drivers are well-trained; the transport vehicles are safe for operation; and the trips are scheduled, conducted, and tracked to avoid adverse weather and traffic conditions. Should an incident occur, the response by the drivers, the site (through the Facility Shift Manager [FSM] as the initial decision-maker and the Central Monitoring Room), and AL is directed by a formalized, integrated set of response procedures. In recognition of the importance of providing the public with timely and accurate information following any off-normal or emergency event, the public information plans that would be implemented for either an onsite event or an offsite incident involving a WIPP shipment are well-conceived. The States and Tribal Education Program, which trains local emergency responders in how to respond to a transportation incident involving a WIPP shipment, is highly regarded by numerous stakeholders throughout the region. The program has been recognized as the benchmark for training local responders in preparation for DOE hazardous materials shipments of all types, and the instructors that support this program have been used by other sites to train along new routes for special hazardous shipments.

Strengths were noted in many onsite emergency management programmatic areas as well. These include formally conducted technical training for onsite emergency responders using highly qualified instructors, a comprehensive set of training requirements for the FSM position and emergency response team members, and a number of positive attributes within the feedback and improvement area, such as a critical Westinghouse Waste Isolation Division (WID) assessment program and an effective lessons-learned program. Additionally, the CAO manager is committed to resolving the emergency preparedness concerns of various stakeholders and the site is making progress in improving these relationships.

However, overall CAO and WID have not applied as much emphasis and attention to the onsite emergency management program as that evidenced for the transportation program, and consequently, many weaknesses were evident. In particular, because of an apparent misinterpretation of DOE Order 151.1, the hazards assessment, which is the foundation for an effective emergency management program, has several significant weaknesses. These include the use of a source term that does not in all cases bound the potential site operating conditions, although it should be noted that since the review, the site has implemented, as a near-term compensatory measure, administrative limits that effectively address this concern. In addition, the site lacks a process for classifying all potential emergencies. Furthermore, CAO did not formally approve the current emergency plan, to which the hazards assessment is an attachment, nor was the plan forwarded to the cognizant secretarial office, as is required by DOE Order 151.1. The emergency response procedures are incomplete in that they do not adequately support the needs of the FSMs as the initial decision-makers to make time-critical decisions, as indicated by the results of the tabletop performance tests conducted with three FSMs. In the training and drill area, the training and examinations for crisis management team members are not challenging, and the qualification status of the crisis management team and other emergency responders has not been accurately tracked. The emergency public information (EPI) plans suffer from a combination of incomplete implementation and lack of formality. For example, the process for developing, approving, and issuing press releases following an onsite event is unclear; there is a lack of consistency in the content and conduct of training for those individuals supporting the onsite EPI program; and despite the complexity involved in coordinating the EPI efforts of WIPP and AL, the offsite EPI program is not formally documented as required by DOE Order 151.1. Corrective action tracking systems have not been consistently used by WID, there have been significant

delays in addressing conditions adverse to quality in the emergency management area, and drill reports have not been completed in a timely manner, which is inconsistent with timely identification and incorporation of lessons learned.

Conclusions

DOE and WID management have expended considerable effort in managing the risks posed by transporting and disposing of TRU wastes. The greatest priority and attention have been placed on implementing an emergency management system for offsite transportation activities, which is perceived by the public to pose the greater risk. As a result, implementation of the transportation emergency management system has effectively minimized the real risks from these activities.

Before this review, the same degree of management attention, emphasis, and resources had not been applied to the onsite emergency management system, and several important deficiencies are evident. Most notable are weaknesses in the hazards assessment, the tools provided for the site's initial emergency response decision-makers, and the formality of certain emergency management system elements, such as the tracking and maintenance of responder qualifications. In spite of the fact that the risk to onsite workers and the public is recognized as low, an increased level of management attention is warranted to provide additional assurance that the appropriate level of emergency response, including protective action implementation for site workers and the public, is promptly initiated should a worst-case onsite event occur. Although still under way, aggressive efforts initiated by CAO and WID management to address identified weaknesses are an indication of the site's commitment to providing this assurance.

FINDINGS

As directed by the Office of the Secretary of Energy, DOE has established a process for recording, tracking, addressing, and resolving findings identified by the Office of Independent Oversight as defined by DOE Order 470.2A, *Security and Emergency Management Independent Oversight and Performance Assurance Program*. The DOE Assistant Secretary for Environmental Management, as the cognizant secretarial officer, and the DOE field element (CAO), as the cognizant line manager, are required to develop a corrective action plan to address the findings identified in this report.

1. The process used by WID and CAO resulted in an emergency planning hazards assessment that does not fully address low-probability, high-consequences accident scenarios, and does not include consequence analyses or output results, such as emergency action levels.

2. WIPP emergency response procedures and decision-making resources do not provide adequate definition or instruction for initial emergency management decision-makers to promptly and accurately categorize and classify an emergency, formulate and implement protective actions, or ensure that DOE Headquarters and offsite agencies are promptly notified of essential emergency information in accordance with DOE Order 151.1.

3. Adequate controls are not in place in the WID training program to ensure that the qualifications of all emergency response personnel are maintained current, and adequate qualified personnel are not available to respond in accordance with WID procedures, which is inconsistent with DOE Order 151.1.

4. The transportation EPI plan and implementing procedures are not formally documented, and roles, responsibilities, and protocols are not adequately defined, as required by DOE Order 151.1.

5. The WID process used to manage emergency management program corrective actions is not well-defined and many of these corrective actions are not identified, tracked, and implemented in a timely manner, as required by DOE Policy 450.4, *Safety Management System Policy*.

1.0 Introduction

The Office of Emergency Management Oversight conducted an emergency management review of the Waste Isolation Pilot Plant in May 2000.

The U.S. Department of Energy (DOE) Office of Emergency Management Oversight, within the Secretary of Energy's Office of Independent Oversight and Performance Assurance, conducted an emergency management review at the Waste Isolation Pilot Plant (WIPP) in May 2000. The primary purpose of this review was twofold: to assess selected emergency management system elements that focus on WIPP's readiness to protect site personnel and the public from the consequences of onsite events that may result in the release of hazardous materials; and to evaluate the site's ability to provide appropriate information or assistance in a timely manner to local emergency responders following an offsite event involving a transuranic (TRU) waste shipment to the WIPP site. Also assessed were the emergency response processes by which the public and other stakeholders are kept informed for both onsite and offsite events. In addition, the team examined the effectiveness of the Carlsbad Area Office (CAO) and contractor feedback and continuous improvement processes as mechanisms for identifying, analyzing, and addressing program deficiencies; implementing corrective actions; and demonstrating and verifying the effectiveness of those actions. An assessment of the effectiveness of local response agencies in responding to an offsite transportation accident was not included in the scope of this review.

The mission of the WIPP site is to provide permanent, underground disposal of TRU and TRU mixed wastes (wastes that also have hazardous chemical components). TRU waste consists of clothing, tools, and debris left from the research and production of nuclear weapons that are contaminated with small amounts of radioactive elements having an atomic number greater than uranium, primarily plutonium. The site is located in southeastern New Mexico approximately 30 miles southeast of Carlsbad, New Mexico, within a remote 16-square-mile tract. Project facilities include excavated rooms 2,150 feet underground in an ancient, stable salt formation, as well as various surface structures designed for transporter unloading and drum transfer to the underground rooms. Eventually, approximately 850,000 55-gallon drums of TRU waste will be contained within the underground structure.

WIPP is expected to receive approximately 30,000 shipments of TRU waste over the next 35 years.

Over the next 35 years, WIPP is expected to receive approximately 30,000 shipments. The shipments will come from ten TRU waste-generating and storage sites, including Hanford, Idaho National Environmental and Engineering Laboratory, Rocky Flats Environmental Technology Site, Savannah River Site, Nevada Test Site, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and several other sites. Since WIPP began operations

TRU shipment nears WIPP site

in March 1999, it has received approximately 50 shipments from three sites. The pace of shipments is expected to ramp up to approximately 17 per week over the next two years.

DOE created CAO in late 1993 to manage DOE's national TRU program office and the WIPP program. CAO coordinates the transuranic program at waste-generating sites and national laboratories, which includes managing the system for collecting, characterizing, and transporting transuranic waste. Within CAO, the Office of the Assistant Manager of Safety and Operations provides direction regarding the site emergency management program. The Office of Environmental Management, as the lead program secretarial office, is responsible for providing overall program guidance and direction to CAO. Within the Office of Environmental Management, the WIPP Office (EM-23) is the line organization responsible for WIPP operation and ultimate closure. As an organizational element of DOE's Albuquerque Operations Office (AL), CAO receives technical and administrative support from AL. AL also has specific responsibilities for directing DOE's response to an offsite WIPP transportation event.

The Westinghouse Waste Isolation Division (WID) is the WIPP management and operating contractor; responsibilities include the site's emergency management program. Key subcontractors with emergency management roles and responsibilities include Day and Zimmerman, LLC. (security); and CAST, Inc. (motor transport carrier). Sandia National Laboratories is the program's lead technical contractor.

The Department of Transportation has set requirements and responsibilities for shippers and carriers of hazardous materials. In the event of a transportation incident involving these materials, the carrier is responsible for being able to immediately provide detailed information to local emergency responders regarding the hazards associated with the shipment. The carrier is also responsible for providing a 24-hour emergency response telephone number where such information can be obtained. Because DOE is the shipper for WIPP, DOE and the TRU waste carrier are responsible for providing the emergency response information. In all cases, local response agencies assume management of the initial response to incidents involving hazardous materials. Under DOE Order 151.1, the Office of Environmental Management is responsible for emergency management policy related to the Department's transportation activities.

2.0 Results

This evaluation addresses areas included in DOE Order 151.1, the associated emergency management guide, and the feedback and improvement element of Core Function #5 to DOE's integrated safety management process. Each section includes key observations, conclusions, and a rating of Satisfactory, Marginal, or Unsatisfactory. These ratings are used to communicate the effectiveness of WIPP's emergency management program and to provide a perspective on where line management attention is warranted. Appendix B provides a more detailed explanation of the rating system.

Hazards Survey and Hazards Assessments

DOE Order 151.1 requires that the scope and extent of emergency planning and preparedness at a DOE site be commensurate with the hazards. In accomplishing this graded approach, emergency management planning efforts begin with the hazards survey, wherein site-specific hazards and associated emergency conditions that may require response are qualitatively identified and assessed. If the qualitative process identifies hazardous material quantities that pose a potential serious threat to workers or public health and safety, then a quantitative emergency planning hazards assessment (EPHA) is performed to estimate the severity of the impact. The assessment results should provide the technical basis upon which to determine the scope of the site's comprehensive emergency management system. This review determined that the hazards survey and hazards assessment generally addressed the attributes required by applicable requirements and guidance. However, errors in consequence assessment methodology and the formulation of incorrect conclusions, detailed in the following paragraphs, prevent the hazards assessment from being a fully adequate document upon which to base the WIPP emergency management program.

The WIPP hazards survey, dated November 1998, includes a detailed list of workplace hazardous materials and their location. A recently updated survey is undergoing review and includes updated quantities of materials to reflect current inventories. Additionally, a continuing management process is in place for reviewing the survey and updating it based on changes in plant operations. Several concerns were noted in the current and updated surveys. Specifically, the surveys did not identify all generic emergency events and conditions potentially affecting the site (e.g., industrial accidents); identify the potential impact of those events on the health and safety of workers and the public; and identify the planning and preparedness requirements of other DOE orders, and Federal, state, and local requirements that apply to WIPP. Consequently, the survey does not constitute a comprehensive tool for use by emergency planners, nor is it an effective emergency response document (single-location summary) for emergency managers.

Significant concerns were identified concerning the manner in which the consequences were determined for potential accidents.

The WIPP EPHA comprehensively addresses site hazards and includes other attributes prescribed in applicable guidance. However, significant concerns were identified concerning the manner in which the consequences were determined for potential accidents and the development of information and procedures that are based on the EPHA results.

The current EPHA was completed in February 1999, before commencing facility operations. A management process is in place for reviewing the EPHA on an annual basis. Notably, plant work orders are routed to the WIPP emergency management coordinator for evaluation of changes in plant processes that may not be addressed by the EPHA. This action provides the opportunity to identify hazards that may need to be assessed in the EPHA before starting work. A revised EPHA, recently prepared by a subcontractor for WID, is currently under review, and incorporates some conservative changes in the analysis process based on input from stakeholders.

High-efficiency ventilation filters can produce a million-fold reduction in particulate releases.

The EPHA describes the facility and its operations and processes, and identifies the hazards of the operations together with hazards outside the DOE controlled area. The WIPP EPHA appropriately includes the events analyzed in the safety analysis report as part of the spectrum of accidents evaluated for potential onsite and offsite consequences. In addition, the EPHA evaluates the "beyond design basis event" extreme malevolent act as suggested by applicable guidance. EPHA calculations clearly show that when ventilation systems function as designed to mitigate a release, all accident sequences are of low consequence to workers outside the facility and the public because of the million-fold reduction in released particulates produced by high-efficiency ventilation filters. The material condition of the facility is very good, and the periodic testing that is performed on ventilation systems should assure continued operability. The EPHA incorrectly reflects the installation of continuous air monitors and associated protective signals that are not present, but this did not affect the EPHA results.

Errors in methodology prevent the hazards assessment from fully addressing low-probability, high-consequence accidents.

Areas of concern were noted with the EPHA methodology, results, and conclusions. The EPHA did not correctly determine the material-at-risk, which is the amount of radioactive material that can theoretically be impacted by a postulated event initiator. The material-at-risk is typically the maximum inventory present, and represents the bounding source term for the quantity of hazardous material subject to release. However, the EPHA used material-at-risk amounts based on safety analysis report values termed "design basis values," which were derived from a statistical distribution of storage drum contents of TRU waste throughout the DOE complex that will ultimately be received at WIPP. This interpretation of applicable guidance resulted in a lower material-at-risk value (by as much as a factor of four) being used in the consequence assessment calculations than that considered as plausible in the safety analysis report. It is important to note that no material has been handled to date at the WIPP facility that exceeds the analyzed material-at-risk value; however, current waste acceptance criteria and facility operating limits permit a higher inventory to be present in the facility. From an emergency planning perspective, it is inappropriate to use an inventory less than that which could be present. The erroneous assumptions result in low calculated doses to critical receptors outside the facility. Therefore, the EPHA does not provide bounding estimates of the possible consequences from low-probability, high-consequence accidents, and until the review, WID had not performed additional analyses or imposed additional administrative controls on hazardous material inventories that would mitigate the impact of this concern. It should be noted that shortly after the completion of the onsite portion of the review, the site implemented administrative limits on drum loading as a near-term compensatory measure to ensure that the EPHA source-term assumptions bound the actual operating conditions.

Other errors were noted in EPHA methodology. For example, protective action criteria were inappropriately changed as derived from safety analysis report methodology based on the probability of the accident sequence occurring. The underground roof fall scenario used the Immediately Dangerous to Life and Health/Emergency Response Planning Guideline-3 (ERPG-3) value instead of the appropriate ERPG-2 dose guideline for the postulated release of carbon tetrachloride. Using the correct, lower protective action criteria could require that an Alert be declared based on the chemical released during the accident sequence, whereas the EPHA currently evaluates the event as of no consequence.

The EPHA inappropriately concluded that no emergency action levels were necessary.

Several other weaknesses were noted in the EPHA content, results, and conclusions. A very important output product of the EPHA is the definition of thresholds, termed emergency action levels, which are used to recognize the failure of facility barriers that contain hazardous materials and to trigger event classification. The EPHA inappropriately concluded that no emergency action levels, and thus no emergency event classification scheme, was necessary. This conclusion was a result of several apparent misinterpretations by WID of DOE Order 151.1, one of which was to exclude extreme malevolent acts from

classification. Malevolent acts are required to be classified if they are initiators for an actual or potential release of hazardous material, and therefore, although the malevolent act scenario was analyzed in the WIPP EPHA, the EPHA should have gone on to include at least one emergency action level for a General Emergency.

The other misinterpretation involved the DOE Order 151.1 requirement that an Alert be declared either when the protective action criteria are exceeded at 30 meters from the release point, or when small fractions of the protective action criteria are exceeded at or beyond the facility boundary, which is defined as approximately 100 meters from the release point. For the waste-handling building and underground exhaust release points, facility boundaries were not defined. Instead, the 30-meter protective action criteria requirement was inappropriately applied at the 100-meter location. As a result, emergency action levels for responding to the less severe Alert emergency were not developed. The site classification procedure only provides thresholds for declaration of "Operational Emergency not requiring further classification." Furthermore, discretionary emergency action levels were not prepared to permit classification for events not otherwise addressed.

One purpose of emergency classification is to ensure that an appropriate level of emergency response, including implementation of predetermined protective actions, is promptly initiated upon recognition of a serious event. Because the site did not consider it necessary to develop emergency action levels, predetermined protective actions linked to emergency action levels were likewise not prepared for WIPP emergency management decision-makers. However, real-time, accident range monitoring of underground and waste-handling building ventilation filter effluents is not available. Consequently, site personnel rely on ventilation system status to indicate the absence of a radiological release, although there is no procedural guidance for this action, and system flowrates are sufficiently large that the existence of leakage flowpaths potentially affecting site personnel might be masked.

CAO has recently appointed a senior technical advisor to strengthen its involvement with the emergency management program.

The above concerns indicate weaknesses in the WID technical review of the EPHA and also indicate that the cognizant DOE Field Office did not exercise adequate oversight of the process. CAO did not perform a formal, technically independent review of the EPHA, which also serves as the basis document for the determination that an emergency planning zone is not required. As a result, an opportunity to detect errors in the EPHA results, and the impact of these errors on the remainder of the EPHA output products, was missed. CAO has recently appointed a senior technical advisor with responsibility for authorization basis oversight to strengthen its involvement with the emergency management program.

FINDING: The process used by WID and CAO resulted in an emergency planning hazards assessment that does not fully address low-probability, high-consequences accident scenarios, and does not include consequence analyses or output results, such as emergency action levels.

In summary, the hazards survey and hazards assessment included many attributes of the applicable guidance, including, for example, an effective process for updating the hazard survey and hazards assessment. Conservative plant design, operations, and maintenance provide high confidence that the facility systems will function as designed and reduce the likelihood that the WIPP emergency management system will be called upon to respond to an emergency affecting the environs outside the facilities. However, inappropriate source-term assumptions contributed to critical faults in the EPHA, although facility operations to date have been maintained within these assumptions. These faults, as well as misinterpretations of DOE Order 151.1 requirements, impacted other elements of the emergency management program, resulting in deficiencies, such as lack of emergency classification thresholds and predetermined protective actions for workers and the public, should an extremely unlikely event occur. WID review and CAO oversight processes were not sufficient to ensure that the technical accuracy of the EPHA provided a complete foundation upon which to develop the WIPP emergency management system.

Rating: Unsatisfactory 

Note: In a May 24, 2000, letter to CAO, WID indicated that administrative limits on drum loading had been implemented as a near-term compensatory measure to ensure that the EPHA source-term assumptions bound the actual operating conditions.

Furthermore, a review of CAO's formal 10-day response to the draft report indicates that CAO and WID are agressively pursuing the satisfactory resolution of other identified weaknesses.

Program Plans, Procedures, and Responder Performance

An effective emergency management plan must be documented to define and convey top-level management's emergency management philosophy and present a program that complies with DOE Order 151.1 for the facilities/programs within its purview. Specific, comprehensive implementing procedures must be developed in conformance with the documented program, and these implementing procedures must be usable by the personnel responsible for their implementation. The WIPP emergency management program uses two emergency response plans. The response to emergency situations associated with transporting TRU shipments is defined in the WIPP transportation plan, and the WIPP onsite plan is defined in the WIPP emergency management program plan.

WIPP Transportation Plan

The transportation plan provides for the extensive coordination necessary among the waste-generating site, the contract carrier (CAST), the waste-generating site state, the downstream transportation route states, the waste burial host state (New Mexico), AL, and WID. CAO, as the national TRU program office, is responsible for developing the WIPP transportation plan. This plan clearly defines the roles and responsibilities of the major organizations that support the plan, and the implementing procedures supporting the plan are complete and effective. However, DOE Order 151.1 requirements for annual plan and procedure reviews are not being met in all cases.

CAO is in the process of revising the WIPP transportation plan, which was last approved in November 1998. One of the implementing procedures, DOE/CAO-94-1039, "Emergency Planning, Response, and Recovery Roles and Responsibilities for TRU Waste Transportation Incidents," was last reviewed and approved in January 1995. This procedure is also being reviewed in conjunction with the plan revision process. Notwithstanding their overdue documented review, both the plan and procedure continue to complement the program.

Local responders demonstrate skills during an offsite exercise

The contract carrier is responsible for the safe transport of waste containers, the first notifications of an incident, and first responder actions.

The contract carrier is responsible for the safe transport of the waste containers, the first notifications of an incident, and first responder actions. WID's responsibilities are limited to communications and notifications. AL is responsible for making notifications, monitoring the initial response by state, local, or tribal emergency organizations, acquiring enough information to categorize the incident, and taking the prescribed actions commensurate with event severity. AL actions may also include a decision to activate and dispatch the WIPP incident/accident response team and radiological assistance program technical teams to assist the on-scene incident commander.

CAST's incident response responsibilities are detailed in the carrier management plan. This plan describes the actions to be taken by the carrier's real-time monitoring staff and the two drivers assigned to each shipment. The emergency procedures are comprehensive, user-friendly, and effective. Real-time monitoring of a TRU shipment is performed, in part, by using the satellite-based transportation tracking and communication (TRANSCOM) system located at Oak Ridge National Laboratory. Besides TRANSCOM, the drivers have a cell phone, satellite phone, and citizens band radio available for communications and notifications purposes. In addition, driver training requirements are extensive and include first responder actions.

CMR staff are knowledgeable of their responsibilities regarding TRU shipments, and the WID transportation emergency procedures are comprehensive.

The plan anticipates that the WIPP Central Monitoring Room (CMR) will be the first organization to be notified of a TRU shipment incident. Observations of the CMR staff monitoring actual TRU shipments indicate that the communication links established by the transportation plan would provide the CMR timely awareness of an incident along the transportation route. Upon becoming aware of a transportation incident, the CMR is responsible for ensuring that required notifications are performed. The principal point of contact for DOE response is transferred from the CMR to AL when the Albuquerque Operations Center notifies the CMR that the AL emergency response duty officer (ERDO) is in control and CMR formally transfers control of TRANSCOM to the Albuquerque Operations Center. CMR staff are knowledgeable of their responsibilities regarding TRU shipments, and the WID transportation emergency procedures are comprehensive. However, the site lacks a notification-specific procedure that concisely notes what type of information is required to be conveyed in the notification process.

AL's principal responder for a TRU shipment incident is the ERDO. Tabletop exercises were conducted to evaluate the performance of the AL ERDOs in responding to a hypothetical accident scenario involving a TRU shipment. The scenario was presented to two ERDOs to test their ability to assess a postulated event, and to formulate and implement the time-urgent decisions that are required in the initial stages of a response to a transportation-related emergency. The ERDOs were encouraged to make use of all reference materials and resources that would normally be available to them in responding to an emergency. AL provided a qualified ERDO to act as a trusted agent to present the hypothetical scenario to the ERDOs. The postulated event was an offsite transportation collision between a commercial carrier and a tractor trailer enroute to the WIPP site with Transuranic Packaging Transporter Model II (TRUPACT-II) containers of transuranic waste.

With few exceptions, ERDOs perfomed well during a tabletop exercise that simulated an accident involving TRU waste.

With few exceptions, the performance of the ERDOs was good. They both promptly confirmed that local responders implemented appropriate isolation distances from the event scene in accordance with the North American Emergency Response Guide. Both promptly employed the ERDO Checklist for WIPP Offsite Transportation Incidents and initiated notifications after correctly categorizing the event. They were aware that the information provided to local responders was in the form of recommendations, not "orders," and that the TRUPACT-II container integrity would be challenged after 30 minutes in a significant fire. However, neither ERDO requested the local responders to examine the container with binoculars to the extent possible to determine if container integrity was maintained as designed. Also one ERDO did not issue the necessary order to the Albuquerque Operations Center Controller to activate the operations center, and as a consequence, activation was delayed.

One notable procedure weakness was identified. DOE/CAO 94-1039, which defines CAO's and AL's roles and responsibilities for emergency response to a TRU waste transportation incident, is inconsistent with the WIPP transportation plan regarding the decision to send DOE technical assets to assist on-scene incident commanders. Although the transportation plan states that response assets will be sent at the request of the state/tribe, the procedure states that DOE will not wait for a request to dispatch these assets.

WIPP Onsite Emergency Management Program

The WIPP emergency management program plan contains the essential elements of an emergency management program as required by DOE Order 151.1, and WID has developed a series of procedures that implement the plan. The plan, implementing procedures, and knowledge of the response staff are appropriate for the types and level of emergency

scenarios currently considered within the program. The WID emergency planning coordinator is knowledgeable of the elements comprising the WID emergency management program and is generally cognizant of their current status. The annual reviews of the plan and implementing procedures by WID are all current. In addition, WID submitted the WIPP emergency readiness assurance plan for FY 2000 to CAO in a timely manner.

A notable weakness exists with the program's review and approval process. Although CAO reviewed both the WIPP emergency management and emergency readiness assurance plans and forwarded them to AL, they were not formally approved, nor was the emergency management plan forwarded to the Headquarters organization responsible for the WIPP program (Office of Environmental Management), as required by DOE Order 151.1. In addition, as noted earlier in the hazards assessment section of this report, inappropriate conclusions were reached regarding emergency classification emergency action levels and predetermined protective actions. Corresponding revisions to the implementing procedures will be necessary, consistent with a revised hazards assessment.

The onsite WIPP emergency response is directed by the WID Facility Shift Manager (FSM), acting as the site crisis manager and incident commander. The FSM position is manned 24 hours per day, thus immediate decision-making authority for classification, formulation of protective actions, and notification is available. The FSM activates the emergency operations center when directed by the applicable implementing procedure, and also has the option of ordering emergency operations center activation at any time subsequent to the incident. Special purpose, technical teams composed of volunteers from the work force also support emergency response. For example, (surface) emergency response team members are qualified as interior firefighters and support the fire brigade. The mine rescue team is a highly qualified team used for advanced mine rescues.

As part of this evaluation, hypothetical radiological release and security event scenarios were developed for incidents that could occur at the WIPP site. The scenarios were presented to three FSMs to test their ability to assess a postulated event, and to formulate and implement the time-urgent decisions that are required in the initial stages of a response to a significant emergency event. The FSMs were encouraged to make use of all reference materials and resources that would normally be available to them in the CMR, including the CMR operator, in responding to an emergency. The WID emergency management coordinator acted as a trusted agent to ensure clear communications of event information using site-specific terminology, and to help validate the observations of the team.

All FSMs demonstrated good familiarity with their roles and responsibilities as the sole decision-maker during the early stages of event response.

All FSMs demonstrated good familiarity with their roles and responsibilities as the sole decision-maker during the early stages of event response. They also demonstrated knowledge of their authority in acting as the initial corporate representative. Response weaknesses were observed in several areas. For example, although two of the FSMs that were evaluated demonstrated good command and control of the situation, distractions such as incoming communications from the scene prevented one of the FSMs from maintaining focus on completing time-sensitive, necessary actions.

Accident assessment activities were not adequately completed by the FSMs to properly assess the magnitude of the event for further decision-making. For example, the on-shift emergency services technician is procedurally required to identify the character, extent, and amount of material released, which is essential to ensure that the ventilation system is performing as designed to afford worker protection for radiological releases. In all three tabletop performance tests, rather than permitting the emergency services technician to confirm that facility confinement had functioned as designed and contained the release, he was deployed to other less critical tasks and prevented from performing confirmatory checks. FSMs appropriately performed some worker protective actions, such as promptly establishing accountability of persons evacuated from the waste-handling building, and in most cases, exercised reasonable care in dispatching initial responders to the scene to assure that they did not become casualties of the event. However, none of the FSMs considered the potential for a hazardous material release and the downwind effects on co-located workers from a potential explosion in the waste-handling building. The FSMs did not issue orders for affected populations to seek shelter or evacuate as appropriate, nor is procedural

guidance available in the form of predetermined protective actions to assist the FSM in determining appropriate actions, as discussed in the hazards assessment section.

FSMs, responsible for onsite WIPP emergency response, performed inconsistently when presented with hypothetical radiological release scenarios.

The FSMs performed inconsistently regarding event recognition and associated event categorization for the two postulated scenarios. One of the FSMs was unable to recognize either event as an Operational Emergency, concluding that both events constituted occurrences. Although this individual recognized that the postulated event had consequences significantly in excess of the thresholds listed in the occurrence reporting procedure, the procedure did not redirect the user to the WIPP categorization and classification procedure.

All FSMs experienced difficulty in completing required notifications. One FSM initiated notifications in a timely manner for a scenario involving the release of radioactive material, but it is unlikely that notifications can be completed in a timely manner because a mechanism, such as a group facsimile and a predefined message format, is not used. This FSM inappropriately assumed that security personnel made notifications related to the declaration of an Operational Emergency due to a security event. Another FSM did not make formal notifications to all required offsite agencies for either postulated event; rather, for one event, the FSM ordered the CMR operator to advise the Albuquerque Operations Center that WIPP was "experiencing a problem." Yet another FSM did not complete the Operational Emergency notifications in a timely manner because the occurrence reporting procedure permits a two-hour reporting window.

The observed notification performance issues are in part caused by the absence of a site notification procedure to orchestrate the required notifications. For example, a preformatted notification message form is not employed at WIPP. Rather, FSMs used rough notes of the event description to notify offsite agencies instead of a preformatted summary of pertinent items related to the emergency. Consequently, FSMs did not report all of the critical elements of a message specified by the Resource Conservation and Recovery Act contingency plan, such as categorization/classification of event and time of the event. It was noted that this plan inappropriately requires the Resource Conservation and Recovery Act emergency coordinator (the FSM) to ensure that local authorities are notified by telephone and/or radio "after consultation with the DOE as the owner of the facility." However, DOE Order 151.1 requires that DOE provide the authority to perform prompt notifications to the contractor. Also causing confusion and delays in the notification process is that notification requirements are found in several different procedures and procedure attachments.

FINDING: WIPP emergency response procedures and decision-making resources do not provide adequate definition or instruction for initial emergency management decision-makers to promptly and accurately categorize and classify an emergency, formulate and implement protective actions, or ensure that DOE Headquarters and offsite agencies are promptly notified of essential emergency information in accordance with DOE Order 151.1.

In conclusion, the WIPP plan developed to respond to transportation incidents is comprehensive and supported by implementing procedures that are complete and effective. Furthermore, the communications, notifications, and planned response actions have been drilled for a number of years. The drills, coupled with more than 50 real shipments to date, have provided CAO and WID with enough experience to embark on an effort to update the transportation plan and associated implementing procedures, which should serve to further enhance an already very good program. Many aspects of the WIPP onsite emergency management program are adequate; however, emergency response procedures do not provide decision-makers the necessary aids to permit them to execute their responsibilities in a timely manner. Procedures and other resources lack sufficient specificity and utility for the tasks to be accomplished, and do not provide adequate direction for the decision-maker to manage the full spectrum of potential emergency events that may occur. Furthermore, FSMs did not in all cases effectively implement existing emergency response procedures.

Rating:

WIPP Transportation Plan - Satisfactory 

WIPP Onsite Emergency Management Program - Marginal 

WIPP mine rescue team training

Training, Drills, and Exercises

To develop and maintain the necessary emergency response, a coordinated program of training and drills must be an integral part of the emergency management program and apply to all emergency response personnel and organizations relied on to respond to emergencies. For a training and proficiency program to be effective, it must include both initial and annual refresher training for the instruction and qualification of all personnel comprising the emergency response organization, as well as drills and a formal exercise program. In general, the transportation-related States and Tribal Education Program (STEP) has had notable success in training state and local emergency response personnel in the mitigation of WIPP transportation accidents. WIPP onsite emergency management training has incorporated the program elements required by DOE Order 151.1. However, weaknesses exist in the administration of emergency operations center personnel training and qualifications, including a first line initial response team (FLIRT) that is not functional because of a lack of qualified personnel. Furthermore, program effectiveness has been limited by significant delays in the processing of drill and exercise reports.

Transportation Program - States and Tribal Education Program (STEP)

The training requirements for STEP are stated in public law 102-579, commonly known as the Land Withdraw Act. Since the law was enacted in 1992, the STEP organization has trained more than 17,000 emergency response students from 18 states along WIPP shipment routes. The organization has also sponsored and supported 25 exercises for states and other jurisdictions along these routes, and is actively soliciting further involvement with additional response organizations.

STEP instructors are highly qualified and have extensive experience in emergency response.

STEP instructors are well-qualified and collectively have extensive experience. All STEP instructors are certified for hazardous materials awareness, incident command (by the California specialized training institute), and medical technician-basic or higher. Two of the instructors are qualified to instruct modular emergency response radiological transportation training, and one instructor has extensive training in Radiological Team Operations and Response. The total emergency response experience for the four instructors is 103 years.

STEP includes an offsite exercise element to enhance the proficiency of local response agencies. Direct assistance provided to states and tribal governments includes a series of five WIPP-specific accident scenarios, as well as an exercise development manual that includes objectives, ground rules, and controller and evaluator information. Reusable props and moulage (i.e., facial and body makeup simulating physical injuries) are provided to the exercise directors and coordinators who do not have the manpower or budget for these items. Specialized briefings are provided for participants' exercise controllers and evaluators, as most small and remote towns have never participated in a large-scale exercise.

The effectiveness of STEP is limited by factors outside the organization's control, as it has no ability to direct the emergency response jurisdictions to participate in training, conduct a WIPP transportation exercise, or request additional related services. Thus, the extent of STEP-related activities vary with the public interest in WIPP and with the budgetary priorities of the jurisdictions. For example, in 1999 no exercises were conducted (one exercise was cancelled because of the participants' inability to agree on the exercise plan). In 1996 only 114 students were trained, while in 1999, 3,648 received training. Participants are responsible for preparing the exercise reports, and may or may not accept suggestions on format and content, which are offered by the STEP organization. Often the reports are of little value in developing suggestions

to improve future exercises; however, this is beyond the direct control of STEP.

Onsite Emergency Response Organization Training

Training is provided to the emergency response organization through formal classroom training, self-paced instruction, on the-job-training, and drills and exercises. For most emergency responders, a formal qualification card system is employed. Training requirements for each emergency response group are developed from statutory requirements (Resource Conservation and Recovery Act), DOE orders, and job-specific requirements. The technical training section then develops courses to satisfy these requirements. The WID communication department is responsible for training public information personnel. Line managers are responsible and accountable for the training and qualification of their assigned personnel. Periodic drills and exercises augment classroom training to develop and maintain proficiency in required emergency preparedness, response, and mitigation skills. The technical training section has an excellent formalized training plan and implementing procedures and highly qualified instructors. Members of the emergency response teams who were interviewed, without exception, enthusiastically endorsed the quality of the training.

Twelve of 17 crisis management team members were not current on training requirements.

Although strong in some areas, the onsite training program is not sufficiently structured to ensure that all of its objectives are being satisfied. When used, the centralization of qualification records in the technical training department provides the necessary controls over the program and provides management with rapid access to qualification information. The qualification and requalification requirements for site emergency response teams and first responders are well-developed in accordance with a comprehensive procedure. However, 12 of 17 emergency operations center crisis management team members – senior WID managers who man the 17 emergency operations center – were not current on training requirements. Although the technical training section's record system has a module that notifies individuals in advance of expiration of their qualifications at 90-day, 60-day, and 30-day intervals, the qualification expiration dates of the crisis management team had not been entered into the system. When informed of this situation, WID management quickly qualified one crisis management team and took action to qualify backup personnel. Qualification expiration dates for these individuals are now included in the qualification records database.

Inconsistencies exist in the rigor of the initial qualification and re-qualification processes for different emergency response positions.

Also limiting the effectiveness of the training program are inconsistencies in the rigor of the initial qualification and requalification processes for different emergency response positions. For example, to qualify for the crisis manager position, a senior manager must complete two self-study courses and pass open-book exams with a grade of 80% or higher; the testing process does not include a performance-based test. The key crisis management staff members are required to complete a single course and pass an examination. In contrast to the extensive requirements for positions such as the FSM, the crisis management team courses and their examinations are not challenging and do not provide assurance that the crisis manager and staff are qualified to perform their assigned emergency management functions. In addition, a February 2000 self-assessment of the emergency management training program determined that initial and annual refresher training for all emergency response personnel for their assigned positions had not been developed and that their past drill participation had not been documented. Until recently, the WID emergency preparedness coordinator maintained drill reports and attendance records as hard copy. The coordinator and the technical training manager have since instituted a system to collect and record drill attendance in the technical training automated record system, which will permit rapid retrieval correlation with formal classroom and on-the-job training qualification information. Drill and exercise reports from prior years were found to be of acceptable quality. However, with the exception of statutorily required underground evacuation drills, drill and exercise reports for FY 2000 have not been completed.

Readiness maintenance of the FLIRT is also a weakness. Only one member of the FLIRT, which is composed of volunteer underground workers who are

trained to respond to underground emergencies (particularly first aid and small diesel fuel spill incidents), is fully qualified for the position. Two other individuals are nearing completion of their qualifications; however, the minimum team size is five qualified individuals, with a desired number of eight. The only statutory requirement that WIPP must meet is to have two mine rescue teams available for in-mine rescue from the surface, and mine rescue teams from nearby facilities, under memoranda of understanding, can be used to fulfill this requirement. There are other mitigating factors for the current lack of qualified FLIRT members. These include the presence of two first aid-qualified mine rescue team members on each underground shift, two first aid-qualified members on the hoist crew, and the availability of the shift emergency services technician to respond to the scene of an underground medical event within approximately 15 minutes. Nonetheless, underground emergency procedures, such as the one used to respond to a hazardous material spill, direct that the FLIRT be called out. Because currently there would be no FLIRT response on one shift, procedures for responding to underground emergencies cannot be implemented as written.

In part, FLIRT staffing problems can be attributed to a lack of planning and coordination between the WID operations department and the WID emergency preparedness coordinator. Recent transfers of workers from underground to surface positions decreased the number of available FLIRT-qualified personnel. This is exacerbated by the fact that FLIRT workers' qualifications are not easily achieved. Some courses are available only infrequently; some courses require a release from work by their supervisors for several sequential days, or they must voluntarily take courses on their days off.

FINDING: Adequate controls are not in place in the WID training program to ensure that the qualifications of all emergency response personnel are maintained current, and adequate qualified personnel are not available to respond in accordance with WID procedures, which is inconsistent with DOE Order 151.1.

In conclusion, the STEP training program has had notable success in training state and local emergency response personnel in the mitigation of WIPP transportation accidents. The program is highly regarded by numerous stakeholders throughout the region, and has been recognized as the benchmark for training local responders in preparation for DOE hazardous materials shipments of all types. Elements of the onsite emergency response training program (i.e., the classroom training and on-the-job training, drill, and exercise programs) meet most of the requirements for an emergency management training program. However, the program lacks a challenging performance-based qualification program for the crisis manager and staff, the FLIRT cannot currently perform its mission because of a lack of qualified personnel (although this function can be accomplished by other emergency response personnel), and drill and exercise reports are not being completed in a timely manner.

Rating:

Transportation Program - States and Tribal Education Program - Satisfactory 

Onsite Emergency Response Organization Training - Marginal 

Emergency Public Information and Offsite Response Interfaces

CAO and WID are responsible for developing and maintaining the national TRU program, whose goal is to provide an effective and safe transportation system to transport transuranic waste products from various sites to WIPP. The primary consideration of this program is to ensure the health and safety of employees, contractors, and the public at and around the WIPP site and along the transportation corridors. Intrinsic to the program is the development of an effective emergency public information (EPI) program.

The process and regulations to effectively address a potential accident at the WIPP site differ from those required to address an incident during the shipment of the TRU waste. Therefore, for this evaluation the EPI program was separated into two distinct categories: transportation EPI and onsite EPI. Offsite response interfaces are addressed in the transportation category.

In general, the transportation EPI plan is conceptually well-organized but lacks the formal documentation necessary to ensure that DOE will be able to provide accurate and timely information in support of state and local government to protect public health and safety. At WIPP, effective offsite interfaces have been achieved through the combination of the EPI program and STEP. Additionally, due to the issuance of the newly revised Joint Information Center

operations program plan, CAO has a good foundation in place for the onsite EPI program.

Transportation Emergency Public Information and Offsite Response Interfaces

A well-organized and coordinated effort is needed to make a timely and effective response to a WIPP transportation incident. The CAO Office of Public Affairs and WID have played an extensive proactive role in developing the public education and EPI programs along the transportation corridor.

The site has established and maintained various outreach programs that enable it to effectively communicate with offsite organizations.

An effective offsite interface program requires a clearly defined process outlining the integration and coordination of activities between DOE and Federal, tribal, state, and local organizations. CAO and WID have established and maintained various outreach programs enabling them to effectively interface with offsite organizations. One successful program is STEP, as described in the previous section. Another is the ongoing public information exchange with states, locals, and various media before and during each shipping campaign. A third is coordinating with the Western Governor's Association, Southern States Energy Board, and Council of State Governments (MidWest, NorthEast) on the emergency plans and developing communication protocols.

Since 1995, CAO has maintained a strategic plan for stakeholder outreach designed to involve those concerned or affected by WIPP activities. In 1998, the plan expanded the public involvement strategies and audience to include neighboring, nationwide, and international stakeholders, and institutional and government representatives. The goal of the plan is to provide an effective two-way communication link between stakeholders and the CAO. The strategies are to improve communication and the provision of accurate and timely information; achieve productive working relationships; encourage stakeholders to participate in planning and decision-making; improve awareness and responsiveness of CAO to stakeholder issues; and improve the effectiveness of STEP. As a result, the lead states along the corridor have developed WIPP-specific transportation emergency plans and procedures. These plans, and CAO EPI support of these plans, have been successfully exercised.

Local contacts were very satisfied with CAO outreach efforts and responses to requests for information and training.

As part of this evaluation, contacts were made with several stakeholder groups, including the Carlsbad Mayor, Fire Department, Hobbs Regional Medical Center, the governor's representative to WIPP, and the Environmental Evaluation Group — a WIPP oversight group. Local contacts were very satisfied with CAO outreach efforts and responses to requests for information and training; these efforts include recent initiatives by the CAO manager intended to improve WIPP's relationship with the Environmental Evaluation Group. The state provides outreach training and information coordination specific to WIPP. The state representative indicated some programmatic concerns, but agreed that progress is being made. The more prominent concerns of stakeholder groups are those related to personnel costs associated with last-minute shipment delays, use of TRANSCOM for monitoring empty shipment vehicles, and inconsistencies in using designated points of contact.

In an effort to provide comprehensive emergency management programs, a myriad of requirements have been developed by DOE, various stakeholders, and lead corridor states, including two DOE orders (5530.3 and 151.1) and several concepts of operations and protocol documents. Some of these documents assign authority for WIPP incident response to DOE offices other than CAO, some develop EPI protocols that are not coordinated, and some create conflicts of responsibility and authority. The coordination of EPI, when responding to a transportation incident, belongs solely with CAO. Current protocol requires CAO to coordinate news releases with the AL Office of Public Affairs, who will in turn coordinate with Headquarters. The number of required approvals is likely to impede the timely release of information in support of local governments. In addition, while applicable DOE orders are based on technical response to an emergency, each order has an EPI dimension. The presence of inconsistent and overlapping requirements makes the formalization of this EPI program difficult to discern, coordinate, and implement.

There is no plan or procedure formalizing the transportation EPI program.

Several other weaknesses in the EPI program limit its effectiveness. For example, although CAO has developed a transportation EPI program and cultivated the contacts, there is no plan or procedure formalizing the process. Instead, the WIPP transportation plan contains a communication section that deals only with public education. Reliance on an individual's knowledge rather than using procedures creates the potential for confusion and delays in releasing information in the event of an emergency. The CAO Joint Information Center operations program plan and procedures are adequate for providing timely and effective information during an onsite emergency, but these documents do not address offsite interfaces and the associated coordination activities required for a transportation incident. In addition, the AL EPI plan does not address any of the coordination issues required for an effective EPI response in support of state and local entities along the transportation corridors. The collective result of these weaknesses is that the transportation EPI plan and implementing procedures do not meet all the requirements of DOE Order 151.1.

FINDING: The transportation EPI plan and implementing procedures are not formally documented, and roles, responsibilities, and protocols are not adequately defined, as required by DOE Order 151.1.

As part of this evaluation, a hypothetical scenario was presented as a tabletop exercise, separately, to the CAO and the AL Offices of Public Affairs. The performance of the CAO Office of Public Affairs team leader reinforced the conclusion that CAO has a well-developed approach to their response to a transportation incident. The actions taken in response to the scenario by the AL Office of Public Affairs acting director appropriately indicated that their role was one of coordination.

Onsite Emergency Public Information

The CAO Office of Public Affairs and WID have developed a working relationship designed to ensure a seamless organization. In April 2000, WID expanded and revised the Joint Information Center operations program plan to include procedures in the form of desktop instructions. The concept adopted by the plan addresses the required elements of an effective EPI plan. However, the processes delineated in the procedures do not provide a clear and concise method to provide timely and accurate information.

The Joint Information Center operations program plan adequately describes the scope and nature of the EPI program.

The Joint Information Center operations program plan adequately describes the scope of the EPI program, Joint Information Center mission and facilities, and development and distribution of public education. The desktop instructions, or procedures, provide an explanation and the scope of responsibilities required to implement that plan. However, several procedures do not comprehensively define the processes required to ensure the effective completion of a task. For example, insufficient detail is available to ensure that timely and accurate information is developed, approved, and released to the public and media. Various individuals are responsible for different aspects of the cumbersome approval process, but the necessary links required to ensure the timely completion of the process are not incorporated within the procedures. These include coordination between the crisis manager, emergency operations center public affairs coordinator, newswriter, media information manager, Joint Information Center manager, DOE spokesperson, AL Office of Public Affairs, and legal.

Other plan and procedural weaknesses may also contribute to confusion and delays in releasing information to the public. These weaknesses include the absence of a procedure describing dispatch and emergency responsibilities of the emergency operations center public affairs coordinator; no mechanism to update *WIPP Today*, which is used as the e-mail link to update project employees about an incident; no assigned roles for inviting offsite governments to participate in the Joint Information Center; and no description of the system used to identify the emergency severity level of an incident at WIPP. Furthermore, although the WID communications department is responsible for providing that training for the EPI program, the Joint Information Center operations program plan does not address training, nor is there

evidence of a comprehensive plan or schedule being developed. WID has produced various Joint Information Center position training modules, but there are no records available to document that any training was given. This is inconsistent with DOE Order 151.1 requirements that there be a documented, coordinated, and comprehensive program of initial and annual training for all members of the emergency response organizations.

In addition to EPI program plans and procedures, a variety of effective public education brochures and pamphlets and a well-balanced media kit were reviewed. The documents are well-developed and informative. However, some documents have not been updated to reflect the initiation of radioactive waste shipments to the site, which is not consistent with effective public education practices.

In conclusion, for offsite response interfaces, CAO has developed effective interfaces with Federal, state, tribal, and local agencies, organizations, responders, and the public along the WIPP transportation corridors. Although progress is being made, some stakeholder concerns remain unresolved. Progress has been made in establishing and improving the onsite and offsite transportation EPI programs, and both are well-organized conceptually. The onsite program, which was recently revised, adequately describes the scope of the EPI program, but the associated processes are not adequately defined. The results of the tabletop evaluations performed for the transportation program indicate that information will be released in an accurate and timely manner to protect public health and safety. However, the DOE Order 151.1 requirement for a documented plan and implementing procedures have not been met. Resolution of conflicting responsibility and authority requirements for CAO and AL will require CAO management involvement with cognizant Headquarters organizations.

Rating:

Transportation Emergency Public Information and Offsite Response Interfaces - Satisfactory

Onsite Emergency Public Information - Satisfactory

Feedback and Continuous Improvement Process

Feedback and continuous improvement programs provide the mechanisms to identify, track, and correct deficiencies and program weaknesses. Additionally, these programs should include provisions for providing assessment of performance and for sharing lessons learned. WID has implemented many elements of an effective feedback and continuous improvement program for emergency management. However, the process used by WID to manage corrective actions is not well-defined, and many corrective actions are not identified and tracked in a timely manner.

WID has established effective mechanisms for obtaining valuable feedback from WIPP staff. WID uses its corrective action report process to identify, document, and track deficiencies and their resolution, and includes provisions for verifying the completion of corrective actions and identifying adverse performance trends. This process ensures that issues are adequately addressed and appropriate corrective actions are implemented.

Corrective actions were not always entered into the site's tracking system.

However, WID does not use the corrective action report process to resolve all identified issues. WID initiates corrective action reports only for "conditions adverse to quality." Therefore, many deficiencies and their related corrective actions are not included in this process. WID uses a sitewide commitment tracking system to track issues from the corrective action reports and other sources, such as those issues transmitted to WID from CAO and those pulled from occurrence reports. However, with the exception of the corrective action report process, there is no procedure governing the management of issues or the use of the commitment tracking system. Issues from sources other than corrective action reports are entered into the commitment tracking system at the discretion of the responsible manager. As a result system usage and data are inconsistent. For example, corrective actions from occurrence reports were not always entered into the site's tracking system, so it is often not possible to determine the status of corrective actions without physical verification. WID has initiated a change to the occurrence reporting procedure that, when implemented, will require all corrective actions from occurrence reports to be entered into the commitment tracking system. Also, all incomplete corrective actions from occurrence reports were recently entered into the commitment tracking system. Despite the informality in tracking corrective actions, a review of a

sample of 11 closed corrective actions from two of the more significant occurrence reports confirmed that corrective actions were, in fact, complete.

The emergency management program also has effective mechanisms for obtaining valuable feedback on emergency management system performance through exercise, drill, and event critiques and through programmatic assessments. WID reviews its response to actual events to evaluate and improve performance, such as an evacuation of the contact handling bay due to a spurious continuous air monitor alarm. For this event, corrective actions were promptly identified and entered into the commitment tracking system. However, corrective actions from the last 20 drills, all of which were conducted in FY 2000, have not been entered into any tracking system. Some weaknesses identified in drills were corrected and re-evaluated in subsequent drills. However, the timely and systematic identification and tracking of corrective actions from drills would provide a much higher level of confidence that all weaknesses will be adequately addressed and will decrease reliance on staff knowledge and memory to identify performance trends and recognize weaknesses across program elements.

The February 2000 WID self-assessment was rigorous and provided valuable observations and improvement items.

CAO and WID both conduct annual assessments of the WIPP emergency management program. The WID quality assurance department conducted an assessment of the emergency management program in February 2000. The assessment was rigorous and provided observations and improvement items that, if addressed, should result in significant improvements to the emergency management program. However, some of the benefits of this in-depth internal review may be lost since none of the observations or improvement items were entered into the site corrective action tracking system. Additionally, no corrective action reports were initiated even though this is the mechanism used by WID to identify and document actions taken to correct and preclude recurrence of conditions adverse to quality. In April 2000, the WID quality assurance department revised its assessment procedure to make the assessors, rather than the cognizant manager, responsible for initiating corrective action reports and entering corrective actions into the tracking system. This should ensure that future assessment findings and observations are addressed, but this action does not address the need to document and track corrective actions resulting from the last annual assessment.

FINDING: The WID process used to manage emergency management program corrective actions is not well-defined and many of these corrective actions are not identified, tracked, and implemented in a timely manner, as required by DOE Policy 450.4, *Safety Management System Policy.*

DOE Order 151.1 requires an external assessment of the emergency management program by the operations/field office at least once every three years. CAO, with the assistance of AL, has performed assessments at WIPP annually to coincide with the annual emergency exercise. Although CAO arranged for an annual visit by a team from AL to review the WIPP emergency management program, the overriding focus of the review centered on the annual WIPP exercise. Interviews and planning documentation indicate some level of review of program elements other than the exercise, but there were no documented results beyond the exercise. Conduct of the review annually, using an expert team from AL, is commendable, but does not ensure that all essential elements of the WIPP emergency program are effectively reviewed within the three-year cycle.

WIPP has an effective lessons-learned program that captures and disseminates emergency management-related information from numerous sources and effectively communicates that information to all levels of the organization. The lessons-learned working group evaluates information from DOE, the Mine Safety and Health Administration, the Nuclear Regulatory Commission, and news articles to determine applicability to WIPP. The group is composed of individuals with varied backgrounds and expertise, including environmental, safety, operations engineering, and quality. Lessons-learned reports are sent to managers with a feedback form attached to provide feedback on how well the working group provides pertinent, useful information. A one-page bulletin containing lessons learned and safety articles is issued monthly and posted throughout the site. Lessons learned from the 1999 emergency management exercise concerning the Draeger self-contained breathing apparatus used by mine rescue

teams were shared not only with the DOE complex, but also with the Mine Safety and Health Administration, local potash mining companies, and Draeger Safety, Incorporated.

Overall, CAO and WID have implemented many elements of an effective feedback and continuous improvement program for the site's emergency management system, and enhancements to programs are ongoing. Both CAO and WID have conducted emergency management assessments that have provided meaningful feedback, although the structuring of CAO's assessments and oversight of the site's emergency management program were not sufficient to identify several important weaknesses discussed in this report. The lessons-learned program is effectively interwoven into WIPP programs and the site culture. However, the WID process used to manage corrective actions is not well-defined, and many corrective actions are not identified, tracked, and implemented in a timely manner.

Rating: Marginal 

3.0 Conclusions and Overall Rating

The WIPP emergency management program has a number of notable positive attributes. The transportation program is particularly strong. If considered separately, the transportation emergency management program would be judged as Satisfactory, which is reflective of the considerable effort expended by DOE and WID management in this area. The transportation plan is well-conceived and comprehensive, and it facilitates the safe control of the movement of TRU waste. Should an incident occur, the response by the involved personnel and organizational elements is directed by a formalized, integrated set of response procedures.

Other strengths include well-conceived public information programs, and initiatives in both the transportation program and the onsite emergency management program. The onsite emergency management program also benefits from a highly qualified cadre of technical training instructors, a rigorous qualification program for the FSM position, a highly motivated workforce, well-maintained facilities important to safety, and a critical WID assessment program. Additionally, there is a significant commitment by CAO and WID line management to resolving the emergency preparedness concerns of various stakeholders.

However, efforts to develop and maintain the onsite emergency management system have not been uniformly effective in all areas. Most notable are weaknesses in the assumptions and methodology used in the EPHA to determine the theoretical size of the source term used for dose projection purposes and the absence of certain emergency action levels required by DOE Order 151.1. Weaknesses also exist in the procedures, checklists, and other response tools provided for the site's initial emergency response decision-makers that impact their ability to formulate protective actions, categorize events, and effectively notify offsite agencies in a timely manner. In addition, there is an inadequate level of formality in the conduct of certain programmatic activities, such as the tracking and maintenance of responder qualifications, the structuring and reporting of CAO assessments of the site's emergency management program, and the identification of improvement items from drills.

DOE and WID management have appropriately placed significant priority and attention on implementing an emergency management system for offsite transportation activities. However, in light of the expected ramp-up in site activities and the weaknesses that exist in the onsite emergency management program, an increased level of line management attention is warranted to provide additional assurance that the site can adequately respond to the full range of potential onsite events.

The overall rating of Marginal and the individual element ratings reflect the current status of the overall WIPP emergency management program. It should be noted that the concern regarding the EPHA source-term assumptions has been effectively addressed by an administrative limit imposed by WID as a near-term compensatory measure, and CAO and WID are aggressively pursing the satisfactory resolution of other identified weaknesses.

Overall Rating: Marginal 

Ratings by Report Element	
Hazards Survey and Hazards Assessments	Unsatisfactory
Program Plans, Procedures, and Responder Performance	
WIPP Transportation Plan:	Satisfactory
WIPP Onsite Emergency Management Program:	Marginal
Training, Drills, and Exercises	
Transportation Program - States and Tribal Education Program (STEP):	Satisfactory
Onsite Emergency Response Organization Training:	Marginal
Emergency Public Information and Offsite Response Interfaces	
Transportation Emergency Public Information and Offsite Response Interfaces:	Satisfactory
Onsite Emergency Public Information	Satisfactory
Feedback and Continuous Improvement Process:	Marginal

4.0 Opportunities for Improvement

The emergency management review conducted by the Independent Oversight team identified several 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 managers, and prioritized and modified as appropriate, in accordance with site-specific programmatic and emergency management objectives.

WID

- Improve the accuracy and clarity of the hazards survey and hazards assessment to enable their use by emergency planners and emergency managers in planning, preparing, and responding to the full spectrum of accidents that may affect WIPP facilities, and to facilitate in-depth, independent reviews.

- Consider plant modifications that permit real-time, downstream monitoring of waste-handling building and underground filter performance (station B & C) and upstream monitoring of the underground exhaust stream (station D) to permit immediate assessment of emergency event consequences, and provide prompt emergency management decision aids.

- Establish methods and mechanisms to facilitate the prompt notification of applicable organizations following event categorization or classification, regardless of the time of day.

- Validate, through performance testing, the emergency response implementing procedures to ensure that they can be performed as written to efficiently accomplish the desired actions in a high-stress, time-urgent environment.

- Consider assigning the WID emergency preparedness coordinator a voting position on the qualification boards of all FSM and CMR operator candidates.

- Evaluate and document participation in WIPPTREX and WIPPTRAX exercises, and develop and disseminate lessons learned to previous and potential participants in a format that does not include criticism of participants by local response agencies, (e.g., sanitized, summary newsletter). Include the lessons learned in the pre-exercise informational packet sent for future exercises.

- Validate EPI and Joint Information Center procedures to ensure that they clearly state all organizational roles, responsibilities, and requirements.

- Train spokespersons and telephone teams on the health and safety concerns and effects potentially caused by an incident, including the effects on safety and health, the definition of the event categories and classifications, and the correlation with event severity.

- Use a flow chart to depict the public information approval process to reflect every activity and the individual responsible. Develop procedures for information development, coordination for accuracy, coordination for approval, visible sign off, hand off to support staff, and distribution to media, public, employees, HQ, AL, and stakeholders.

- Review all public education documents annually for accuracy.

- Review and update the WIPP emergency management program document to include EPI revisions.

- Review and revise the Joint Information Center operations program plan to include transportation incidents.

- Capture commitments made to Western Governors Association; Southern States Energy Board; Council of State Governments; and state,

local, and tribal governments for coordination and support in applicable procedures.

- Document and track through resolution the outstanding offsite issues identified through the awareness and responsiveness strategy.

- Update the WIPP emergency operations plan to include EPI revisions upon completion of the transportation EPI plan and procedures.

CAO

- Develop a formal, structured assessment plan to ensure that all of the program elements of the WIPP emergency management program are reviewed on a three-year basis.

- Develop formal memoranda of understanding with AL and Headquarters/Office of Environmental Management that assign and describe roles and responsibilities for the submittal, review, and approval of the WIPP emergency management plan, EPHA, and emergency planning zone.

- Seek resolution from the cognizant Headquarters organization regarding the conflicting authority and responsibility issues between DOE orders 151.1 and 5530.3 with respect to transportation EPI.

Office of Security and Emergency Operations (SO)

- Resolve conflicting authority and responsibility issues between DOE orders 151.1 and 5530.3.

APPENDIX A
FINDINGS FOR CORRECTIVE ACTION AND FOLLOW-UP

This appendix summarizes the significant findings identified during the Office of Independent Oversight and Performance Assurance emergency management review of the WIPP emergency management program. The findings identified in this appendix will be formally tracked in accordance with DOE Order 470.2A, *Security and Emergency Management Independent Oversight and Performance Assurance Program* and will require a formal corrective action plan. The DOE Assistant Secretary for Environmental Management and the CAO need to specifically address these findings in the corrective action plan. Other weaknesses and/or deficiencies identified in this report should be addressed by line management but need not be included in the formal corrective action plan.

FINDING STATEMENT	REFER TO PAGES:
1. The process used by WID and CAO resulted in an emergency planning hazards assessment that does not fully address low-probability, high-consequences accident scenarios, and does not include consequence analyses or output results, such as emergency action levels.	8
2. WIPP emergency response procedures and decision-making resources do not provide adequate definition or instruction for initial emergency management decision-makers to promptly and accurately categorize and classify an emergency, formulate and implement protective actions, or ensure that DOE Headquarters and offsite agencies are promptly notified of essential emergency information in accordance with DOE Order 151.1.	12
3. Adequate controls are not in place to ensure that the qualifications of all emergency response personnel are maintained current, and adequate qualified personnel are not available to respond in accordance with WID procedures, which is inconsistent with DOE Order 151.1.	15
4. The transportation EPI plan and implementing procedures are not formally documented, and roles, responsibilities, and protocols are not adequately defined, as required by DOE Order 151.1.	17
5. The WID process used to manage emergency management program corrective actions is not well-defined, and many of these corrective actions are not identified, tracked, and implemented in a timely manner, as required by DOE Policy 450.4.	19

APPENDIX B
EVALUATION PROCESS AND TEAM COMPOSITION

The evaluation was conducted under the direction of the Secretary of Energy's Office of Independent Oversight and Performance Assurance. The evaluation was performed according to formal protocols and procedures, including an Appraisal Process Guide, which provides the general procedures used by Independent Oversight to conduct inspections and reviews, and the evaluation plan that was developed specifically for this activity, which outlines the scope and conduct of the process. Planning discussions were conducted to ensure that all team members were informed of the review objectives, procedures, and methods.

Explanation of Rating System

The Office of Independent Oversight and Performance Assurance assigns an overall rating to the emergency management program; ratings are also assigned to selected individual elements of the program. The rating process involves the critical consideration of all evaluation results, particularly the identified strengths and weaknesses. In the case of weaknesses, the importance and impact of those conditions is analyzed both individually and collectively, and balanced against any strengths and mitigating factors to determine their impact on the overall goal of protecting emergency responders, site workers, and the public. The Office of Independent Oversight and Performance Assurance uses three rating categories—Satisfactory, Marginal, and Unsatisfactory—which are also depicted by colors as Green, Yellow, and Red, respectively.

Satisfactory (Green): An overall rating of ***Satisfactory*** is assigned when the emergency management program being evaluated provides reasonable assurance that all of the site's emergency responders are ready to respond promptly and effectively to an emergency event or condition.

An emergency management element being evaluated would normally be rated Satisfactory if the emergency management function were effectively implemented. An element would also normally be rated as Satisfactory if, for any applicable standards that are not met, other compensatory factors exist that provide equivalent protection to workers and the public, or the impact is minimal and does not significantly degrade the response.

Marginal (Yellow): An overall rating of ***Marginal*** is assigned when the emergency management program being evaluated provides questionable assurance that site workers and the public can be protected following an emergency event or condition.

An emergency management element being evaluated would normally be rated Marginal if one or more applicable standards are not met and are only partially compensated for by other measures, and the resulting deficiencies in the emergency management function degrade the ability of the emergency responders to protect site workers and the public.

Unsatisfactory (Red): An overall rating of ***Unsatisfactory*** is assigned when the emergency management program being evaluated does not provide adequate assurance that site workers and the public can be protected following an emergency event or condition.

An emergency management element being evaluated would normally be rated Unsatisfactory if one or more applicable standards are not met, there are no compensating factors, and the resulting deficiencies in the emergency management function seriously degrade the ability of the emergency responders to protect site workers and the public.

Team Composition

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