Independent Oversight Review of the Emergency Management Program Technical Basis and Emergency Preparedness at the National Energy Technology Laboratory

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Office of Environment, Safety and Health Assessments
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Acronyms

CRAD	Criteria, Review, and Approach Document
DOE	U.S. Department of Energy
EAL	Emergency Action Level
ED	Emergency Director
EMG	Emergency Management Guide
EOC	Emergency Operations Center
EPHA	Emergency Planning Hazards Assessment
EPZ	Emergency Planning Zone
ERO	Emergency Response Organization
GOGO	Government-Owned, Government-Operated
HAZMAT	Hazardous Material
HSS	Office of Health, Safety and Security
IC	Incident Commander
IEA	Office of Independent Enterprise Assessments
MAA	Mutual Aid Agreement
MCI	Mass Casualty Incident
MGN	Morgantown Site
NA-41	DOE/ National Nuclear Security Administration Office of Emergency Operations
NETL	National Energy Technology Laboratory
NPE	Natural Phenomena Event
OE-1	HSS Operating Experience Level 1
OE	Operational Emergency
OFI	Opportunity for Improvement
OHU	Occupational Health Unit
PAR	Protective Action Recommendation
PGH	Pittsburgh Site
SARS	Safety Analysis Review System
URS	URS Corporation

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1.0 PURPOSE

The U.S. Department of Energy (DOE) Office of Independent Enterprise Assessments (IEA) was established in May 2014 and assumed responsibility for managing the Department's Independent Oversight Program from the Department's former Office of Health, Safety and Security (HSS). HSS conducted this independent review of the DOE Office of Fossil Energy National Energy Technology Laboratory (NETL) Pittsburgh site (PGH) and Morgantown site (MGN) emergency preparedness programs prior to the creation of IEA. HSS performed this review to evaluate compliance with DOE Order 151.1C, *Comprehensive Emergency Management System*, with emphasis on the sites' response to a severe natural phenomena event (NPE) as described in HSS Operating Experience Level 1, *Improving DOE Capabilities for Mitigating Beyond Design Basis Events* (OE-1). This report discusses the scope, background, methodology, results, and conclusions of the review.

DOE Order 227.1, *Independent Oversight Program*, establishes the responsibilities and authorities of the Department's Independent Oversight program. The Independent Oversight program comprises one element of DOE's multi-faceted approach to oversight as described in DOE Order 226.1B, *Department of Energy Oversight Policy*. Effective oversight, including independent oversight, of DOE Federal and contractor operations is an integral part of the Department's responsibility as a self-regulating agency to provide assurance of its safety and security posture to its leadership, its workers, and the public. The Independent Oversight program is designed to enhance DOE safety and security programs by providing DOE and contractor managers, Congress, and other stakeholders with an independent evaluation of the adequacy of DOE policy and requirements, and the effectiveness of DOE and contractor line management performance in safety and security and other critical functions as directed by the Secretary.

2.0 SCOPE

This Independent Oversight review, conducted February 24-27, 2014, consisted of a general overview of the two sites' emergency management program, with a focus on the technical planning basis and associated plans and procedures. This review is based on a sampling of data and is not intended to represent a full programmatic review of the sites' emergency management system or the implementation of the training, drills, and exercise programs. Although the results of this review provide an indicator of the effectiveness of the program implemented by NETL MGN and PGH, the results and conclusions do not reflect the status of implementation of all program elements.

The primary areas of interest are the identification of needed site response capabilities and their state of readiness. The NETL facilities of interest include:

- PGH-Building 65
- MGN-Building 16.

The scope of this review includes portions of the following emergency management program elements:

- Technical planning basis
- Emergency preparedness.

This review was conducted to determine whether the sites have established the appropriate emergency management program based on the technical considerations and methodologies required by DOE Order 151.1C. This review assessed both the response capabilities identified by the sites' analyses and the sites' plans and procedures for attaining and maintaining the necessary response and recovery capabilities. The scope of this review is consistent with HSS Criteria, Review, and Approach Document (CRAD) 45-60, *2014 Emergency Management Program Technical Basis and Emergency Preparedness Review*.

This Independent Oversight review comprises one element of DOE's multi-faceted approach to oversight described in DOE Order 226.1B. For activities and programs at government-owned, government-operated (GOGO) facilities and sites (MGN and PGH) that are not under the cognizance of a DOE field element, DOE Headquarters program offices must establish and implement comparably effective oversight processes consistent with requirements for the contractor assurance system and DOE line management oversight processes.

3.0 BACKGROUND

Both MGN and PGH are GOGO sites that conduct research and development and serve as a program implementation office, with the mission of enhancing the commercialization of promising fossil energy technologies for the U.S. energy market and for export by U.S. suppliers. To perform this mission, several laboratories house hazardous material (HAZMAT) for use in conducting research into fossil fuel energy technology.

MGN is located within Monongalia County, West Virginia, on the northern end of the city of Morgantown. The site covers approximately 132 acres, 46 acres of which are developed as industrial. There are 45 buildings and trailers on site. The site also hosts a credit union, a daycare facility, and a U.S. Navy radio communications facility that occupies approximately 10 additional acres of land. The remaining 86 acres are undeveloped. NETL also leases one building directly south of the site boundary within the Research Ridge Office Complex. There are 698 employees working at the site; 266 are Federal employees and 432 are site support contractors. The land surrounding the site is a combination of residential and commercial areas and deciduous forest, with approximately 5,400 local area residents within one mile of the site boundary. Two small streams border the site on the east and northeast sides, and all surface drainage goes into these two streams.

PGH is located within the Bruceton Research Center on a secluded portion of South Park Township, within Allegheny County, Pennsylvania, approximately 15 miles southwest of the city of Pittsburgh. The site has buildings occupied by both DOE and Pittsburgh Research Center personnel. The offsite areas are zoned residential, except for a small strip zoned as industrial, with residential areas and open land on the south and west boundaries. Until recently, the residential areas were largely underdeveloped, consisting mainly of horse farms; however, some large developments of new homes have recently been built near the site. Areas to the immediate north and west of the facility are subdivided into single-family housing plots. The site and surrounding area are characterized by moderately steep, sloping hills and lush vegetation. The PGH physical facilities are located at the apex of these hills. There are 36 buildings and trailers on site. NETL also shares the site with the National Institute of Occupational Safety and Health and the Mine Safety and Health Administration. The work performed on site is accomplished through both in-house research and development and contracted research. There are 776 employees working at

the site; 344 are Federal employees and 432 are site support contractors, with approximately 3,700 residents within one mile of the site.

Previous assessment activities include the DOE/National Nuclear Security Administration Office of Emergency Operations (NA-41), which conducted a no-notice exercise at MGN on June 27, 2012. The exercise was limited in scope to preclude unnecessary interference or disruption of operations and was designed to focus on the demonstration of key command, control, and communications functions normally executed in response to an Operational Emergency (OE). The after-action report identified no areas for improvement.

NA-41 also conducted a no-notice exercise at PGH on June 19, 2013. The exercise (limited to onsite field response) focused on command, control, and communications functions normally executed in response to an OE. This no-notice exercise was overlaid on PGH's annual emergency management exercise. The DOE Headquarters Watch Office also participated in the exercise. Eleven of the 12 exercise objectives were evaluated as being met. One area for improvement was identified for the communications objective.

There is no record of the Office of Fossil Energy having conducted the oversight activities required in DOE Order 151.1C or DOE Order 226.1B at MGN or PGH.

4.0 METHODOLOGY

Independent Oversight evaluated whether the MGN or PGH sites have established the appropriate emergency management program based on technical considerations and methodologies required by DOE Order 151.1C, including the implementation of Fukushima lessons learned for DOE emergency management programs described in OE-1. The order identifies the functional emergency response requirements for a DOE site/facility, and the emergency management guides (EMGs) associated with DOE Order 151.1C provide guidance for implementing these requirements. Independent Oversight used the order and EMGs as the basis for determining whether DOE requirements and expectations were met. Independent Oversight also referenced applicable DOE, Federal, state, and local requirements when determining compliance with the DOE order.

Independent Oversight reviewed the documentation that establishes and governs NETL emergency management program processes, including emergency plans, procedures, program implementing checklists, records of program activities, and memoranda of agreement; interviewed key personnel; and performed walkdowns of facilities.

5.0 RESULTS

The objective of this review was to verify that NETL has a sound Emergency Management program which contains the major elements specified in DOE Order 151.1C. The focus of the review was implementation of the program elements to ensure that facility-specific hazards were identified and analyzed, and that the results were integrated into the hazards surveys, EPHAs, and emergency plans and procedures to ensure effective emergency responses. Independent Oversight identified eight findings and eight opportunities for improvement (OFI), based on the following review criteria from HSS CRAD 45-60.

Review Criteria:

The Emergency Management program, including organizational structure and administration, is

technically-based, is commensurate with the facility-specific hazards, and is sufficient to provide for effective implementation and control of all HAZMAT emergency events as required by DOE Order 151.1C and has been updated to incorporate the Fukushima lessons learned described in OE-1.

5.1 Technical Planning Basis

DOE Order 151.1C requirements and associated guides provide detailed guidance on determining whether a site requires an OE HAZMAT program and how to establish an appropriate response based on technical considerations. For NPE planning, sites are required to consider scientific and historical data to determine plausible scenarios for analysis and to prepare for these events by establishing technically based protective actions and emergency planning zones (EPZs). Additionally, the order requires the development of emergency action levels (EALs) for the spectrum of potential OEs identified in the emergency planning hazards assessment (EPHA), which must include pre-determined protective actions for onsite personnel and protective action recommendations (PARs) for the public, if applicable, corresponding to each EAL.

Independent Oversight reviewed the NETL Emergency Readiness Assurance Plan to determine the accuracy of the identified HAZMAT and whether the NETL emergency management program is required to be an OE HAZMAT program. The process guides that NETL uses to develop their hazards surveys and EPHAs, as well as the safety analysis review system (SARS) process used for acquisition of chemicals at NETL were reviewed. MGN and PGH hazards surveys and EPHAs were reviewed to determine the accuracy and adequacy of analyses conducted for severe NPEs. The SARS process reports were reviewed and walkdowns were conducted to determine the accuracy of the EPHA-identified HAZMAT.

Independent Oversight's initial document review identified that ammonia was the only toxic HAZMAT listed in the NETL Emergency Readiness Assurance Plan requiring an OE HAZMAT program; however it was later noted that ammonia is no longer stored onsite and is appropriately excluded from the hazards survey, indicating that the NETL emergency management program could be an OE base program. Nevertheless, during the facility walkdowns, Independent Oversight identified HAZMAT (hydrogen fluoride and hydrochloric acid) not previously identified in the hazards surveys or analyzed in the EPHAs, confirming that the NETL emergency management program should be an OE HAZMAT program.

Additionally, NETL has not developed procedures that provide clear guidance for establishing the administrative and management requirements for developing, reviewing, approving, and maintaining the hazards surveys, EPHAs, and EALs. Consequently, NETL has not developed thorough, order-compliant hazards surveys, so its EPHAs do not provide a valid technical foundation commensurate with the sites' hazards, and its EALs do not provide pre-determined protective actions for the OEs identified in the EPHAs.

DOE Order 151.1C requires that hazards surveys be used to identify the conditions to be addressed by the comprehensive emergency management program and that EPHAs be used to define the provisions of the OE HAZMAT program so that the program is commensurate with the identified hazards. The order also requires that to establish protective actions for events that disperse chemical material, sites must use the Acute Exposure Guideline Levels promulgated by the U.S. Environmental Protection Agency; the Emergency Response Planning Guidelines published by the American Industrial Hygiene Association; or the Temporary Emergency Exposure Limits developed by DOE. Additionally, the order requires the development of EALs for the spectrum of potential OEs identified in the EPHA, and planned initial onsite protective actions and offsite PARs, as appropriate, must be associated with each EAL. DOE Guide 151.1-2, *Technical Planning Basis EMG*, recommends that analyses in the EPHA calculate the consequences at specific receptors of interest (i.e., facility boundary, onsite receptor locations, site

boundary, and offsite locations of interest) and calculate the maximum distances at which consequences exceed the applicable protective action criteria used to develop default initial protective actions.

The hazards surveys that NETL has developed for MGN and PGH contain information on the buildings/areas at each site but do not contain all required information. The hazards surveys discuss the generic types of emergency events or conditions applicable to each building or trailer, and they identify each building's construction, occupancy, special hazards, fire protection systems, fixed toxic gas monitoring system sensor locations and set points, and facility monitoring system alarms. Nevertheless, NETL does not have a procedure for developing and maintaining the hazards surveys that ensures they contain all the information required by DOE Order 151.1C. The hazards surveys do not list the planning and preparedness requirements that apply to each type of hazard or document the use of an accurate HAZMAT screening process and appropriate screening criteria. The hazards surveys also do not indicate whether MGN and PGH need EPHAs that contain further quantitative analysis of any HAZMAT. NETL is aware that it needs, but has not established, an accurate and timely method for tracking changes in operations, processes, or accident analyses that involve HAZMAT (e.g., introduction of new material, new uses, significant changes in inventories, or modification of material environments) for each facility/activity. Acquisition of HAZMAT at NETL is controlled through NETL Procedure 440.1-02.02D, *Chemical Inventory and SARA Title III Reporting*, however, the procedure does not ensure that changes in HAZMAT quantities are communicated to the hazards survey and/or EPHA developer. Consequently, the NETL hazards surveys do not provide adequate identification (e.g., walkdowns, administrative limits, or chemical inventory systems) and qualitative assessment of the MGN- or PGH-specific hazards. (See **Finding F-NETL-1** and Section 9.0, **OFI-NETL-1**.)

Finding F-NETL-1: NETL has not developed hazards surveys for MGN and PGH that meet the requirements of DOE Order 151.1C.

NETL has developed EPHAs for MGN and PGH that generally incorporate the requirements of DOE Order 151.1C. The EPHAs contain descriptions of the buildings, operations, and processes; consequence assessments; and site EPZ determinations. The EPHAs also postulate a spectrum of potential emergency event/condition scenarios, such as NPEs, accidents, external events, or corrosion that may involve a release of HAZMAT. Further, per recommendations in the EMG, the consequence analyses were conducted using the same software modeling program (Areal Locations of Hazardous Atmospheres) that is used for emergency operations center (EOC) consequence analyses conducted during emergency events.

Nevertheless, the PGH EPHA does not contain current, accurate compilations of HAZMAT inventories. Independent Oversight identified toxic HAZMAT (hydrogen fluoride and hydrochloric acid) that is stored and used at PGH but was not included in the PGH hazards survey or EPHA. Additionally, the MGN and PGH EPHAs do not provide the maximum quantities associated with each building/trailer based on reliable and comprehensive methods of HAZMAT identification (e.g., walkdowns, administrative limits, or chemical inventory systems). Further, HAZMAT was not appropriately identified and screened in the MGN and PGH hazards surveys, resulting in the analysis of materials that are simple asphyxiates, cryogenics, or not toxic (liquid nitrogen, methane, and hydrogen) and thus do not represent a classifiable OE per the order and guide. The EMG recognizes that facility-specific circumstances (e.g., large quantities of asphyxiates or cryogenic materials) might cause impacts consistent with the OE definition, and in such cases the site may choose to analyze the material in an EPHA. However, the MGN and PGH EPHAs do not document the rationale for retaining liquid nitrogen, methane, and hydrogen for quantitative analysis, but excluding hydrogen fluoride and hydrochloric acid. Consequently, these EPHAs do not provide clear and convincing evidence that the emergency management planners clearly understand the facility-specific hazards, and they do not represent a valid technical foundation for

developing an emergency management program that is "commensurate with hazards." (See **Finding F-NETL-2** and Section 9.0, **OFI-NETL-2**.)

Finding F-NETL-2: NETL has not developed and documented a valid technical planning basis in the MGN and PGH EPHAs that are used to determine the extent and scope of the OE HAZMAT program, as required by DOE Order 151.1C.

Additionally, the EPHAs' appendices titled "Protective Action Criteria Levels and Emergency Action Levels" contain information that does not support the formulation and communication of pre-determined protective actions for the spectrum of potential OEs identified in the EPHAs. The EPHA appendices pertaining to EALs provide only the fixed gas monitoring alarm set points, flammability range, and protective action criteria for the EPHA-identified HAZMAT; they do not provide the observable event indicators, descriptions, or classification determinations and do not provide pre-planned protective actions. The order requires the development of EALs for analyzed events for which the EPHA identifies onsite and offsite impacts, and planned initial onsite protective actions and offsite PARs, as appropriate, must be associated with each EAL. Consequently, NETL is not prepared to provide timely and effective notification and implementation of protective actions for onsite personnel or PARs to offsite agencies, thereby limiting their ability to mitigate risks to workers and the public. (See **Finding F-NETL-3** and Section 9.0, **OFI-NETL-3**.)

Finding F-NETL-3: NETL has not developed site/facility-specific EALs corresponding to each analyzed event in the MGN and PGH EPHAs, as required by DOE Order 151.1C.

Overall, the program's technical basis is deficient in several areas required for a compliant OE HAZMAT program: hazards surveys are incomplete, there is not a consistent screening rationale for the HAZMAT in the hazards surveys, and there is not an effective HAZMAT tracking process. These deficiencies contribute to the EPHAs not providing an adequate technical basis for developing the NETL emergency management program. Additionally, EALs have not been appropriately developed for the analyzed events in the EPHAs, resulting in the absence of required pre-determined protective actions.

5.2 Emergency Preparedness

DOE Order 151.1C requires that emergency planning include development and maintenance of emergency plans and procedures, including the identification of personnel and resources needed for an effective response. The site emergency plan defines and conveys the management philosophy, organizational structure, administrative controls, decision-making authorities, and resources necessary to maintain the site's comprehensive emergency management program. Specific implementing procedures are then developed that conform to the plan and provide the necessary detail, including decision-making thresholds, for effectively executing the response to an emergency, irrespective of its magnitude. These plans and procedures must be closely coordinated and integrated with offsite authorities that support the response effort and receive DOE emergency response recommendations.

5.2.1 Emergency Plan

Independent Oversight reviewed the NETL emergency plan that describes the common emergency management program used by both sites. The correlation between the emergency plan, EPHAs, and emergency readiness assurance plan was also examined.

Independent Oversight determined that the NETL emergency plan provides an incomplete description of the emergency management program and incorrectly states some parts of the emergency response concept of operations.

DOE Order 151.1C requires the development and documentation of an integrated OE HAZMAT program, which addresses all of the emergency management program elements. The order further requires that the emergency plan describe the provisions for response to an OE. DOE Guide 151.1-3, *Programmatic Elements EMG*, provides guidance on the recommended content for an emergency plan that provides a comprehensive description of the emergency management program elements and fully describes the concept for responding to an OE.

NETL Operating Plan 151.1-01F, *Comprehensive Emergency Management System*, serves as the emergency plan for both sites and generally describes the provisions for the response to an OE, but does not depict the entire concept of operations. The plan discusses the 15 elements of an emergency management program in varying levels of detail and references applicable emergency procedures where appropriate. However, the plan does not include some of the recommended content from DOE Guide 151.1-3 for the 15 program elements necessary for a comprehensive description of the program. For example, NETL does not provide key pieces of information for the following program elements:

- Technical planning basis:
  - No site maps
  - No maps showing the EPZ for each site
  - No description of the known hazards originating outside the sites that could impact the health and safety of onsite personnel, such as railroad tracks and nearby industrial facilities
  - No description of the prominent natural and manmade features such as rivers, lakes, dams, groundwater features, and flood plains near the sites
  - No description of the offsite population surrounding PGH.
- Emergency facilities and equipment:
  - No floor plans of the site emergency facilities, such as the EOC and joint information center
  - No description of backup power systems available for emergency facilities and key equipment.
- Emergency response organization (ERO):
  - No description of the time required to staff the site EOCs during normal and off-duty hours
  - No description of the minimum number of EOC positions required to be filled for activation.

As a result, the plan provides an incomplete description of the NETL emergency management program. (See Section 9.0, **OFI-NETL-4**.)

The emergency plan also contains numerous inconsistencies and provides some incorrect information. For example, a detailed description of ERO responsibilities is provided in paragraph form and then repeated in a table, but the descriptions are inconsistent and some key responsibilities are omitted from either the paragraph description or the table, such as the responsibility for:

- Activating the EOC
- Leading the incident evaluation team
- Ensuring that the incident action plan is developed and documented
- Assisting in the relocation of evacuees
- Writing news releases.

In addition, the plan incorrectly lists the personnel assigned to some responsibilities, such as development of the incident action plan and approval of public information releases. Further, the list of facilities with significant hazards provided in the plan differs from the lists provided in the emergency readiness assurance plan and EPHAs. The Federal Emergency Response Program Manager also does not review the plan annually as stated in the plan, but rather every two years as required by the NETL directives

process. Moreover, the plan describes the EPZ as ending at the site boundary; this description is inconsistent with the EPZ description in the EPHAs. Of more significance are the instances of information contrary to the requirements of DOE Order 151.1C. The definitions for Alert, Site Area Emergency, and General Emergency provided in the plan are inconsistent with the definitions in the order and the EPHAs, and no definitions are provided for the different types of OEs not further classified. The plan also states that state and local officials are required to be notified within 30 minutes for OEs further classified as an Alert, Site Area Emergency, or General Emergency, whereas the order requires notification within 15 minutes. (See **Finding F-NETL-4** and Section 9.0, **OFI-NETL-4**.)

Finding F-NETL-4: NETL does not document all aspects of the emergency management program and does not correctly describe some provisions for response to an OE, as required by DOE Order 151.1C.

Overall, NETL's emergency plan documents the emergency management program used at both sites and describes the provisions for response to an OE. However, it omits several critical pieces of information needed for a comprehensive description of the program and incorrectly describes some aspects of the concept of operations for an emergency response.

5.2.2 Emergency Procedures

Independent Oversight reviewed the common set of NETL emergency procedures used by the EROs at both sites to respond to an OE. The correlation between the emergency procedures, emergency plan, web-based employee emergency response training, visitor safety information, and mutual aid agreements (MAAs) was also examined. Independent Oversight also examined the facility emergency shutdown procedures used to secure operations before an evacuation and the procedures the ERO uses to perform selected time-urgent initial response actions.

Independent Oversight determined that detailed procedures exist for some aspects of the emergency management program, but ERO procedures for the time-urgent initial response actions of categorization and classification, sheltering, sitewide evacuations, and offsite notifications are inconsistent and incomplete, and they do not meet some order requirements.

DOE Order 151.1C requires the development of procedures that describe how the emergency plan will be implemented, including actions that may be taken to increase the effectiveness of protective actions. The order also requires that workers and the public be informed in advance of planned protective actions and that training and periodic drills be provided to all workers who may be required to take protective actions. DOE Guide 151.1-4, *Response Element EMG*, provides guidance on actions that can enhance the effectiveness of sheltering in place.

Facility-specific procedures at both sites describe the emergency shutdown processes necessary to appropriately stabilize HAZMAT and prevent further damage, but the ERO procedures do not consider whether these emergency shutdown processes were completed. SARS requires each facility with HAZMAT to develop a standard operating procedure that includes emergency shutdown actions for the applicable pieces of equipment. For example, the Materials Synthesis and Electrochemistry Lab standard operating procedure lists emergency shutdown actions for numerous pieces of equipment, such as plating units, furnaces, and ovens. Further, the emergency plan states that during an emergency, employees will follow the emergency shutdown procedures for their facility; however, the ERO procedures do not specify confirming the completion of emergency shutdown actions before evacuation of the facility. Consequently, the ERO may be unaware of additional hazards that may result from the failure to complete emergency shutdown actions at affected facilities. (See Section 9.0, **OFI-NETL-5**.)

NETL has appropriate procedures in place for performing rescue and medical duties and implementing protective actions. Volunteer personnel serve on a HAZMAT/Rescue Branch at each site and perform rescue duties on site, and onsite emergency medical services are provided by a combination of professional staff and trained volunteers. In addition, Fire Wardens are assigned to each emergency evacuation zone at the sites and are responsible for ensuring that facility evacuation, sheltering, and personnel accountability are performed. NETL Procedure 151.1-01.03E, *ERO Position Specific Procedures*, provides detailed instructions for employees performing rescue and medical duties and the processes for Fire Wardens. This procedure also includes other appropriate duties for the Fire Wardens, such as updating personnel accountability checklists, assisting disabled personnel during evacuations, and ensuring that emergency exits remain accessible and safe. NETL procedures specify completing accountability within 45 minutes, in accordance with the recommended EMG limits of 30-45 minutes.

However, NETL procedures omit several actions that would increase the effectiveness of sheltering in place. For example, although NETL procedures discuss securing ventilation systems during sheltering, the procedures and actual practices do not incorporate some measures that the EMG recommends to enhance the effectiveness of sheltering, such as:

- Preselecting rooms that will provide the most protection
- Sheltering in interior facility rooms
- Positioning necessary materials (plastic sheeting, sealants, and tape) in the designated shelter rooms
- Sealing penetrations with tape or plastic
- Providing written instructions for use by shelter occupants.

As a result, NETL provides less than optimal protection for personnel during emergencies requiring sheltering within facilities. (See Section 9.0, **OFI-NETL-6**.)

NETL provides employees with instructions for expected employee emergency response actions, but some information is inconsistent, employees receive little information on sheltering, and sheltering is not practiced periodically. NETL procedure 151.1-01.11, *Employee Emergency Response Action Plan*, is available to employees on the NETL intranet, and web-based emergency response training is provided annually. In addition, visitors and subcontractors receive a site-specific safety pamphlet and a verbal orientation before entering each site. The procedure, training, and pamphlets discuss the processes for reporting emergencies, evacuating, and performing accountability, and the visitor orientation that accompanies the pamphlet briefly discusses sheltering. Employees and visitors are given several telephone numbers for reporting onsite emergencies, and all facilities at both sites hold annual evacuation drills. Nonetheless, several weaknesses were noted. Neither the training, the procedure, nor the visitor's pamphlets contain all of the available emergency reporting telephone numbers, and each document contains a different subset of the telephone numbers. Further, procedure 151.1-01.11 does not include the emergency reporting telephone numbers for cellular telephone users. More significantly, none of the written materials discuss the process for sheltering, and NETL does not hold periodic drills to practice sheltering. Therefore, NETL workers are not sufficiently prepared to implement sheltering as a protective action. (See **Finding F-NETL-5** and Section 9.0, **OFI-NETL-6**.)

Finding F-NETL-5: NETL does not provide periodic drills to all workers who may be required to take shelter-in-place protective actions, as required by DOE Order 151.1C.

NETL has determined that a severe event may necessitate a sitewide evacuation, but the emergency procedures do not address how to carry out this action. Procedures clearly assign the responsibility to order a sitewide evacuation to the emergency director (ED) and state that sitewide evacuations will be

reported and handled through the emergency response program. However, the emergency plan and procedures only address assembling and performing accountability of employees during a facility evacuation and do not address the unique circumstances of a sitewide evacuation. The emergency plan does not specify where MGN and PGH employees would assemble or how to perform accountability during a sitewide evacuation. Further, the emergency plan states that PGH would rely on the local community to provide busing for employees who lack their own transportation, but the procedures and MAAs do not state how busing would be accomplished. The plan and procedures do not discuss transportation arrangements for MGN employees. Overall, NETL lacks a documented process for accomplishing a sitewide evacuation and performing accountability. (See **Finding F-NETL-6** and Section 9.0, **OFI-NETL-6**.)

Finding F-NETL-6: NETL lacks procedures to implement a sitewide evacuation and account for employees, as required by DOE Order 151.1C.

The ERO procedures do not clearly describe the responsibility for the time-urgent initial response actions of performing categorization and classification and determining protective actions, and the definitions for classifying an emergency are inconsistent with DOE Order 151.1C. The emergency plan and procedures do not consistently state that the ED or (if the ED is unavailable) the incident commander (IC) is responsible for categorizing and classifying an emergency event and that the IC is responsible for determining the initial protective actions needed during an emergency. Additionally, the emergency plan, procedures, and MAAs do not describe the interface between the IC and offsite responders providing onsite fire mitigation and HAZMAT response in determining protective actions necessary for onsite personnel. Furthermore, as mentioned in Section 5.2.1, the emergency plan and procedure 151.1-01.03E do not use the definitions stated in the order for the three levels of classifiable emergencies. Consequently, NETL has conflicting, incomplete, and incorrect procedures that describe how emergency categorization and classification are performed. (See **Finding F-NETL-7** and Section 9.0, **OFI-NETL-5**.)

The NETL emergency plan and ERO procedures that address offsite notifications do not clearly assign responsibility, do not include the notification form, and list incorrect time limits for performing this time-urgent initial response action. The emergency plan and procedures do not consistently state that the ED or IC (if the ED is unavailable) is responsible for performing offsite notifications. In addition, neither the emergency plan nor procedure 151.1-01.02J, *Emergency Categorizations, Classifications, and Notifications*, includes a copy of the form for providing these offsite notifications. As mentioned in Section 5.2.1, the emergency plan incorrectly states the notification time requirement for state and local officials for OEs further classified. Procedure 151.1-01.03E also states that local, state, and Federal agencies should be notified within 30 minutes if an emergency is reclassified, contrary to the DOE Headquarters guidance that states follow-up notifications should be fast enough for response activities to be effective in protecting worker and public health and safety. As a result, NETL has conflicting, incomplete, and incorrect procedures for performing offsite notifications. (See **Finding F-NETL-7** and Section 9.0, **OFI-NETL-5**.)

Finding F-NETL-7: NETL lacks a procedure that accurately describes how emergency categorization and classification and offsite notifications are to be performed, as required by DOE Order 151.1C.

Overall, NETL has developed procedures for emergency shutdown actions at their facilities and for employees performing rescue or medical duties; however, the ERO procedures do not consider whether the facility emergency shutdown actions were completed. Employees are provided with procedures listing their emergency response actions, but some information is inconsistent, little information is provided on sheltering, and sheltering is not practiced periodically. In addition, NETL procedures omit

several actions that would increase the effectiveness of sheltering and do not address how a sitewide evacuation would be accomplished. Finally, the procedures governing the time-urgent initial response actions related to categorization, classification, and offsite notifications are unclear, incomplete, and in conflict with parts of DOE Order 151.1C.

5.2.3 Notifications and Communications

Independent Oversight reviewed the notification and communication system descriptions in the emergency plan and procedures. The exercise after-action reports were also examined for issues related to notifications and communications.

Independent Oversight determined that the NETL notification and communication systems allow prompt identification of emergencies and dissemination of information to site personnel. Exercise after-action reports noted only a few weaknesses in notification processes, and NETL has resolved most of these issues.

DOE Order 151.1C requires organizations to provide prompt initial notifications to workers and emergency response personnel and maintain effective communication among response organizations throughout an emergency.

NETL has several notification and communication systems available to promptly learn of emergencies and communicate with most site personnel. The security dispatcher is informed of an onsite emergency through a call received on one of the site emergency telephone numbers or through an alarm from the fire alarm system or the gas alarm system. Methods of notifying onsite personnel of the need to take protective actions include the Emergency Notification System (a public address system tied into each site's fire alarm system), individual building fire alarms, Fire Wardens, or handheld bullhorns. Procedure 151.1-01.03E also requires the EOC Manager to notify onsite tenants and provide PARs, although the onsite electrical substation at MGN (where offsite utilities personnel may be present) is not included in the list of site tenants. (See Section 9.0, **OFI-NETL-6**.)

The NETL notification and communication systems mostly facilitate the flow of accurate and timely information to site personnel. Independent Oversight reviewed six after-action reports to determine whether notification and communication system issues were observed during recent exercises. Notably, both sites held exercises in 2013 that included disruption of two of the normal lines of communication (telephones and cellular telephones). The NETL after-action reports identified a few commonly occurring weaknesses. The MGN EOC had inadequate cellular telephone signal strength, which NETL recently corrected by installing a repeater. NETL also recently corrected technical issues in the Emergency Notification System that prevented broadcasts from reaching all facilities. Finally, some members of the ERO did not receive an activation notice; this issue remains to be resolved. (See Section 9.0, **OFI-NETL-5**.)

Overall, the notification and communication systems allow NETL to quickly determine that an emergency is occurring and provide emergency information to most site personnel. Exercises conducted to test the operability of notification and communication systems identified only a few weaknesses, most of which have been corrected.

5.2.4 Self-Help Program

Independent Oversight reviewed the emergency plan, procedures, and mass casualty plans that describe the NETL resources available on site for emergency response. The exercise after-action reports were also examined for issues related to these self-help resources.

Independent Oversight determined that NETL has rescue and medical emergency resources available at each site for response to a severe event; however, supplies stored near onsite hazards may be unavailable during an emergency. NETL also recently conducted mass casualty incident (MCI) exercises at both sites that led to the recent development of mass casualty plans, although several issues noted during the exercises remain unresolved.

DOE Order 151.1C requires sites to maintain an ERO with overall responsibility for the initial and ongoing response to and mitigation of an emergency. The order also requires that sites provide medical treatment and plan for MCIs.

NETL has several emergency response resources available if the site were to be isolated during a severe event. MGN has a variety of nearby emergency response providers that include a professional fire department with a 5-minute response time, an ambulance service with an 8-minute response time, and a Level I trauma center with a transport time of less than 5 minutes. PGH has a similar variety of nearby emergency response providers; these include a volunteer fire department with a 10-minute response time, an ambulance service with a 10-minute response time, and a Level I trauma center with a transport time of 30 minutes. To supplement this offsite response capability, NETL chose to establish a HAZMAT/ Rescue Branch at each site, composed of trained volunteer employees who provide services that include containing HAZMAT releases, performing confined space rescue, and rescuing incapacitated employees. The HAZMAT/Rescue Branch fire fighting capability is limited to small fires that can be controlled with portable fire extinguishers. A Medical Branch has similarly been established and is composed of two to three nurses, a part-time physician, and an emergency medical technician at each site who would set up a triage treatment area, administer medical treatment, and assist in screening individuals for chemical exposure. The Medical Branch can also enlist the aid of a substantial number of volunteer employees at both sites who have received first aid training. NETL maintains the capability of these branches through required training, periodic drills, and an annual sitewide exercise.

NETL maintains a reasonable stockpile of medical and rescue supplies and equipment at each site and ensures availability of supplies and the operability of equipment; however, the storage of some supplies and equipment near the most significant onsite hazards may limit their usefulness. According to the emergency plan, the HAZMAT/Rescue and Medical Branches are required to inspect, inventory, and test their equipment annually and after each use. The exercise after-action reports noted only one minor issue regarding the need to obtain an additional piece of rescue equipment. While the HAZMAT/Rescue Branches store supplies and equipment in multiple locations at each site, the storage locations at MGN are near the most significant onsite hazards identified by the EPHA. Similarly, the Medical Branches store supplies and equipment primarily in the occupational health unit (OHU) office at each site, but at PGH, the OHU is located near the most significant onsite hazards identified by the EPHA. Consequently, these Branches may not be able to reach their stored supplies and equipment or perform their duties during an emergency involving the most significant onsite hazards identified by the EPHA. (See Section 9.0, **OFI-NETL-7**.)

NETL has successfully performed preliminary planning for an MCI and has conducted exercises involving mass casualties that indicated numerous areas for improvement. Emergency procedures identify mass casualty responsibilities for the Medical Branch, such as establishing a triage and treatment area and preparing patients for offsite transportation. Exercises were held at both sites in 2013 to test

NETL's ability to respond to an MCI when site access was restricted and offsite responders could not assist with medical treatment. The exercise after-action reports noted a number of issues regarding the sites' ability to respond to an MCI, and both sites recently published mass casualty plans to address some of these issues. Issues that remain to be resolved include:

- Lack of pre-determined transport options for the HAZMAT/Rescue Branch at both sites to most effectively move victims to the triage treatment areas
- Lack of pre-designated helicopter landing locations at MGN.

Further, the emergency plan and procedures have not yet been updated to reflect the recent mass casualty plans. Therefore, although NETL has begun planning for MCIs, additional work remains for a comprehensive MCI response. (See Section 9.0, **OFI-NETL-7**.)

Overall, NETL has a variety of onsite rescue and medical emergency resources available for a response to a severe event. A small stockpile of rescue and medical supplies and equipment is maintained on site, although some supplies are stored too near the onsite hazards to ensure their availability in all circumstances. NETL recently conducted exercises with mass casualties that led to developing initial mass casualty plans for the sites. Although the plans address several issues identified during the exercise, several important issues remain to be resolved.

5.2.5 Offsite Response Agreements

Independent Oversight reviewed the emergency plan, procedures, and MAAs that describe NETL's relationship with offsite emergency responders (i.e., fire departments, police departments, ambulance services, and hospitals). The exercise after-action reports were also examined for issues related to interfaces with these offsite responders.

Independent Oversight determined that offsite emergency responders are provided with information on site hazards and opportunities for site tours, training, and exercise participation. However, the MAAs with these responders do not include some critical information and do not receive periodic reviews. In addition, the emergency plan, procedures, and MAAs contain conflicting requirements regarding how often the offsite responders are to be invited to participate in exercises, site tours, and training.

DOE Order 151.1C requires that sites establish and maintain effective interfaces to ensure that emergency response activities are integrated and coordinated with offsite organizations and agencies responsible for emergency response and protection of the workers, the public, and the environment. The order also requires that emergency-related information and training on site-specific conditions and hazards be made available to offsite emergency responders and that these responders be invited to participate in sitewide exercises at least once every three years. Additionally, the order requires documented agreements with offsite medical facilities that agree to accept and treat contaminated, injured site personnel. DOE Guide 151.1-4 provides additional guidance on the recommended content for a comprehensive MAA.

NETL provides suitable information on site hazards to offsite organizations and invites these organizations to participate in site exercises when the exercise scenario presupposes their response. NETL provides copies of the emergency plan to the local emergency planning committees and several of the offsite responders. Site tours and training on NETL emergency procedures and hazards are offered to offsite fire departments biannually. Offsite medical providers (such as hospitals) receive site information via local emergency planning committee meetings.

NETL has documented agreements in place with offsite EROs, but those agreements are incomplete, are not periodically reviewed, and are inconsistent with the emergency plan and procedures. NETL has

entered into MAAs or service agreements at both sites with local fire departments, police departments, ambulance services, and hospitals. In addition, MGN has an MAA with the county emergency dispatch center and PGH with the co-located National Institute for Occupational Safety and Health. The MAAs specify the services that will be provided by both parties, emergency plans and procedures are available upon request, and pre-fire plans are supplied to local fire departments; however, the MAAs do not include the following information recommended by DOE Guide 151.1-4 for a comprehensive agreement:

- Onsite individuals authorized to request aid from the offsite organization
- Offsite individuals authorized to implement the arrangement
- Specified period for re-examination of the provisions and a renewal or termination date.

Although the emergency plan requires MAAs to be updated periodically, the plan does not specify a frequency, and no formal process exists to ensure that MAAs are reviewed; NETL signed most of the MAAs over five years ago. The emergency plan states that offsite organizations are asked to participate in an exercise at least once every three years to test the unified incident command system. However, the MAAs state that offsite organizations are invited to participate in an exercise annually, but only if a response from the offsite organization would be appropriate for the exercise scenario. Furthermore, although the MAAs state that site tours and training on NETL emergency procedures and hazards are to be offered to offsite organizations biannually, NETL procedure 151.1-01.08B, *Emergency Preparedness Training and Appointment of Emergency Responders*, provides conflicting information on the frequency (annually and biannually) and the emergency plan states the frequency as annually. NETL also lacks signed copies of the Pittsburgh area hospital MAAs. Consequently, NETL has not developed and maintained MAAs that contain all necessary information, ensured the continued accuracy of the MAA content, and provided clear requirements on interfacing with offsite responders. (See **Finding F-NETL-8** and Section 9.0, **OFI-NETL-8**.)

Finding F-NETL-8: NETL has not ensured that MAAs provide for effective interfaces with offsite EROs, as required by DOE Order 151.1C.

Overall, NETL provides offsite EROs with information on site hazards, training, and invitations to participate in site exercises. NETL also has documented agreements with these organizations but has not ensured that all key information is included, does not review the agreements periodically, and does not ensure that copies of all MAAs are current. Furthermore, the emergency plan, procedures, and MAAs contain conflicting requirements regarding frequency of exercise invitations, site tours, and training.

6.0 CONCLUSIONS

Independent Oversight noted several positive practices during its review of the NETL MGN and PGH emergency management technical planning basis and emergency preparedness. NETL provides information and offers site tours, training, and exercise participation to offsite emergency responders, and uses effective notification and communication systems to alert employees. NETL has a number of "self-help" resources available if the sites are isolated during a severe event, and recently conducted mass casualty exercises that led to the development of mass casualty response plans. The HAZMAT/Rescue Branch personnel are trained to contain HAZMAT releases, perform confined space rescue, and rescue incapacitated employees. NETL also has a Medical Branch, composed of trained medical staff as well as a large number of trained volunteers, that can provide triage and administer medical treatment.

However, Independent Oversight determined that the technical planning basis for the program is insufficiently developed to provide a sound foundation for the emergency management program. The PGH and MGN hazards surveys and EPHAs do not identify the HAZMAT requiring further analysis,

specify the planning and preparedness requirements that apply to each identified hazard, or appropriately screen HAZMAT that could be eliminated from further analysis. Additionally, EALs used to provide onsite protective actions and offsite PARs have not been fully developed and properly implemented. Independent Oversight also determined that the emergency preparedness documents (emergency plans, procedures, and MAAs) inadequately describe the emergency management program, contain conflicting information, and incorrectly describe some aspects of their concept of operations, such as categorization and classification, protective actions, and offsite notification processes. Importantly, NETL does not augment the information provided to state and county emergency management organizations to include offsite consequence assessment determinations derived from the facility EPHAs.

Going forward, MGN and PGH is required to fully develop their hazards survey and EPHA processes, develop a strategy for risk management/hazards mitigation/response and recovery, and clearly articulate that strategy in their emergency plan and complementary procedures. Exercises should then be developed to validate plans, procedures, and training, while a robust readiness assurance process provides feedback. Additionally, the Office of Fossil Energy is required to establish and implement effective processes for oversight of the MGN and PGH emergency management programs consistent with DOE line management oversight processes outlined in DOE Order 226.1B and DOE Order 151.1C.

7.0 FINDINGS

Findings represent significant deficiencies or safety issues that warrant a high level of attention from management. If left uncorrected, findings could adversely affect the DOE mission, the environment, the safety or health of workers and the public, or national security. Findings may identify aspects of a program that do not meet the intent of DOE policy.

Finding F-NETL-1: NETL has not developed hazards surveys for MGN and PGH that meet the requirements of DOE Order 151.1C.

DOE Order 151.1C requires that hazards surveys be used to identify the conditions to be addressed by the comprehensive emergency management program. The NETL hazards surveys do not provide appropriate screening of the sites' HAZMAT and do not meet the requirements of the order. Consequently, the hazards surveys do not provide adequate identification and qualitative assessment of the hazards and the associated emergency conditions that may require an emergency response.

Finding F-NETL-2: NETL has not developed and documented a valid technical planning basis in the MGN and PGH EPHAs that are used to determine the extent and scope of the OE HAZMAT program, as required by DOE Order 151.1C.

DOE Order 151.1C requires that EPHAs be used to define the provisions of the OE HAZMAT program so that the program is commensurate with the identified hazards. The NETL EPHAs do not provide an appropriate analysis of the HAZMAT and do not document the rationale for excluding toxic materials, while retaining asphyxiate and cryogenic materials for quantitative analysis. Consequently, the EPHAs do not provide clear and convincing evidence that the emergency management planners clearly understand the facility-specific hazards, and they do not represent a valid technical foundation for developing the emergency management program.

Finding F-NETL-3: NETL has not developed site/facility-specific EALs corresponding to each analyzed event in the MGN and PGH EPHAs, as required by DOE Order 151.1C.

DOE Order 151.1C requires that site/facility-specific EALs be developed for the spectrum of potential OEs identified by the EPHA, and planned initial onsite protective actions and offsite PARs must be associated with each EAL. Although the NETL EPHAs contain EAL statements, the statements do not include the recommended protective measures for onsite personnel and offsite agencies. Consequently, NETL is currently not prepared to provide effective notification and implementation of protective actions and PARs.

Finding F-NETL-4: NETL does not document all aspects of the emergency management program and does not correctly describe some provisions for response to an OE, as required by DOE Order 151.1C.

DOE Order 151.1C requires that the emergency management program must be documented in an emergency plan that also describes the provisions for response to an OE. Although the NETL emergency plan documents some aspects of the emergency management program, it omits many key pieces of information needed to provide a complete description. In addition, the plan contains numerous inconsistencies, conflicts with other emergency documents, and provides incorrect information. As a result, the emergency plan does not provide an accurate or comprehensive description of the emergency management program.

Finding F-NETL-5: NETL does not provide periodic drills to all workers who may be required to take shelter-in-place protective actions, as required by DOE Order 151.1C.

DOE Order 151.1C requires that initial training and periodic drills be provided to all workers who may be required to take protective actions (e.g., shelter-in-place, assembly, and evacuation). Although NETL provides initial training on protective actions and conducts evacuation drills for their workers, written materials do not discuss sheltering and NETL does not hold periodic drills to practice sheltering. As a result, NETL does not effectively prepare its workers to implement the protective action of sheltering.

Finding F-NETL-6: NETL lacks procedures to implement a sitewide evacuation and account for employees, as required by DOE Order 151.1C.

DOE Order 151.1C requires that procedures be developed to implement the protective action of evacuation and account for employees after an emergency evacuation has been completed. NETL has procedures that describe how facility evacuations would be conducted, but no such description exists for a sitewide evacuation. Further, NETL procedures do not address how accountability would be conducted for this type of evacuation. Consequently, NETL is currently not prepared to conduct a sitewide evacuation if it were to become necessary.

Finding F-NETL-7: NETL lacks a procedure that accurately describes how emergency categorization and classification and offsite notifications are to be performed, as required by DOE Order 151.1C.

DOE Order 151.1C requires that procedures be developed that describe how the emergency plan will be implemented. The NETL procedures for determining the categorization and classification of emergencies and for performing offsite notifications provide contradictory statements regarding key responsibilities, omit other key responsibilities and required notification forms, and conflict with the requirements of the order (i.e., contradictory definitions for Alert and General Emergency and notification time limits). As a result, NETL lacks procedures that will ensure effective categorization and classification decisions and timely offsite notifications.

Finding F-NETL-8: NETL has not ensured that the MAAs provide for effective interfaces with offsite EROs, as required by DOE Order 151.1C.

DOE Order 151.1C requires that effective interfaces must be established and maintained to ensure that emergency response activities are integrated and coordinated with the offsite agencies and organizations responsible for emergency response and protection of the workers, public, and environment. The MAAs that NETL uses to document these interfaces do not state who is authorized to request or provide aid, do not undergo periodic reviews to ensure the accuracy of the content, and conflict with the emergency plan and procedures on the frequency of invitations for site tours, training, and exercise participation. Furthermore, NETL lacks copies of some of the signed MAAs. Consequently, the NETL MAAs do not provide an effective mechanism for requesting aid and ensuring that offsite organizations are offered opportunities to stay informed of site hazards.

8.0 FOLLOW-UP ITEMS

The Independent Oversight program comprises only one element of DOE's multi-faceted approach to oversight as described in DOE Order 226.1B. Because this review encompassed only selected emergency management elements identified in DOE Order 151.1C, future DOE oversight activities should consider focusing on other elements of the emergency management program, including readiness assurance, training and drills, exercises, termination, and recovery. Once line management completes a thorough program assessment of the emergency management program and MGN and PGH have implemented and validated their corrective actions, Independent Oversight will again assess the program for compliance with DOE Order 151.1C.

9.0 OPPORTUNITIES FOR IMPROVEMENT

This Independent Oversight review identified the following OFIs. These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are offered to the site to be reviewed and evaluated by the responsible line management organizations and accepted, rejected, or modified as appropriate, in accordance with site-specific program objectives and priorities.

OFI-NETL-1: To ensure that hazards surveys are developed per the order, consider:

- Implementing a procedure for developing and maintaining the hazards surveys that incorporates the requirements of DOE Order 151.1C and OE-1.
- Incorporating the screening criteria of DOE Order 151.1C into the development of the hazards surveys.
- Identifying the planning and preparedness requirements that apply to each identified hazard.
- Establishing a method for tracking changes in operations, processes, or accident analyses that involve HAZMAT for each facility/activity.

OFI-NETL-2: To ensure that EPHAs represent a valid technical foundation for developing the NETL emergency management program, consider:

- Implementing a procedure for developing and maintaining the EPHAs that incorporates the requirements of DOE Order 151.1C and recommendations of OE-1.
- Documenting the rationale for retaining asphyxiate or cryogenic materials for quantitative analyses.

OFI-NETL-3: To establish an appropriate EAL set, consider:

- Implementing a procedure for developing and maintaining the EALs that incorporates the requirements of DOE Order 151.1C.
- Developing an EAL set for the events analyzed in the EPHA.
- Developing initial onsite protective actions and offsite PARs associated with each EAL.

OFI-NETL-4: To ensure that the emergency plan provides a comprehensive description of the NETL emergency management program, consider:

- Following the format and content recommendations for emergency plans in DOE Guide 151.1-3, noting in the plan the rationale for any deviations from the prescribed format and content.
- Eliminating either the paragraphs or the table containing the detailed description of responsibilities and ensuring that the remaining paragraphs or table contains all key responsibilities.
- Updating the plan to reflect the correct information for:
  - Assignments of ERO responsibilities
  - List of facilities with significant hazards
  - EPZ description
  - Definitions for Alert, Site Area Emergency, and General Emergency
  - Notification time requirements for offsite agencies.
- Reviewing the emergency plan annually.
- Adding the definitions for OEs not further classified, as stated in DOE Order 151.1C.

OFI-NETL-5: To improve NETL's response to an emergency, consider:

- Adding to emergency procedures the responsibilities for confirming whether emergency facility shutdown procedures were completed before facilities are evacuated.
- Revising the emergency plan and procedures to reflect a process for performing categorization and classification that clearly assigns responsibilities and uses the definitions for an Alert, Site Area Emergency, and General Emergency from DOE Order 151.1C.
- Modifying the emergency plan, emergency procedures, and MAAs to reflect a process for determining protective actions that clearly assigns responsibilities and plainly describes the interface between the IC and offsite responders.
- Revising the emergency plan and procedures to include a copy of the offsite notification form and to reflect a process for performing offsite notifications that clearly assigns responsibilities and requires timely follow-up notifications.
- Incorporating into emergency procedures additional methods of providing activation notices to ERO personnel.

OFI-NETL-6: To enhance NETL's ability to implement effective protective actions for onsite personnel, consider:

- Incorporating the practices recommended in DOE Guide 151.1-4 for enhancing the effectiveness of sheltering.
- Updating the employee and visitor emergency training, visitor pamphlets, and procedure 151.1-01.11 to include:
  - A complete set of emergency reporting telephone numbers
  - A description of the sheltering process.
- Adding a requirement to conduct periodic drills that allow employees to practice sheltering.

- Developing a process for conducting a sitewide evacuation, including:
  - How accountability would be conducted (e.g., within onsite facilities before exiting the site, outside at onsite assembly areas, or at a pre-determined offsite assembly location)
  - Where employees would assemble off site
  - How employees who lack their own transportation will be brought to the offsite assembly areas.
- Revising the emergency procedures to ensure that emergency notifications and PARs are provided to all onsite tenants.

OFI-NETL-7: To improve the availability and usability of onsite medical and rescue resources, consider:

- Storing medical and rescue supplies and equipment further away from the most significant onsite hazards identified in the EPHAs.
- Determining how long the sites may need to be self-sustaining before additional support arrives, and using that determination to calculate the quantity of supplies (such as triage tags) needed on site.
- Determining how the HAZMAT/Rescue Branch will transport injured personnel to the designated triage areas during an MCI.
- Pre-designating landing locations for air ambulances.
- Updating the emergency plan and procedures to reflect the recently issued mass casualty plans.

OFI-NETL-8: To enhance NETL's interfaces with offsite emergency responders, consider:

- Revising the MAAs to include:
  - Onsite individuals authorized to request aid from the offsite organization
  - Offsite individuals authorized to implement the MAA (i.e., names, titles, and telephone numbers)
  - A renewal or termination date.
- Establishing a process to ensure that MAAs are reviewed at least every five years.
- Revising the MAAs and emergency plan to indicate that offsite EROs (regardless of whether an MAA exists with the organization) will be invited to participate in a site exercise at least once every three years.
- Determining how often site tours and training will be provided to offsite organizations and updating the MAAs, emergency plan, and procedures as necessary to reflect that frequency.
- Ensuring that signed MAAs are entered into a controlled document system to ensure that they are available to the ERO.

Appendix A
Supplemental Information

Dates of Review

Onsite Review: February 24-27, 2014

Office of Independent Enterprise Assessment

Glenn S. Podonsky, Director, Office of Independent Enterprise Assessments
William A. Eckroade, Deputy Director, Office of Independent Enterprise Assessments
Thomas R. Staker, Director, Office of Environment, Safety and Health Assessments

Quality Review Board

William A. Eckroade
Thomas R. Staker
William E. Miller
Michael A. Kilpatrick
Thomas C. Davis

Independent Oversight Reviewers

Randy Griffin – Lead
Deborah Johnson
Teri Lachman

Appendix B
Referenced Documents, Interviews, and Observations

Referenced Documents

- DOE Guide 151.1-2, *Technical Planning Basis EMG*, 7/11/07
- DOE Guide 151.1-3, *Programmatic Elements EMG*, 7/11/07
- DOE Guide 151.1-4, *Response Elements EMG*, 7/11/07
- DOE Order 151.1C, *Comprehensive Emergency Management System*, 11/2/05
- DOE Order 227.1, *Independent Oversight Program*, 8/30/11
- DOE Order 226.1B, *Department of Energy Oversight Policy*, 4/25/11
- HSS Operating Experience Level 1, *Improving DOE Capabilities for Mitigating Beyond Design Basis Events*, Rev. 0, 4/13
- HSS CRAD 45-60, *2014 Emergency Management Program Technical Basis and Emergency Preparedness Review*, Rev. 0, 2/13/14
- NETL *FY14 Emergency Readiness Assurance Plan*, 10/31/13
- NETL Operating Plan 151.1-01F, *Comprehensive Emergency Management System*, 2/8/12
- NETL Procedure 151.1-01.02J, *Emergency Categorizations, Classifications, and Notifications*, 1/16/13
- NETL Procedure 151.1-01.03E, *ERO Position Specific Procedures*, 5/20/11
- NETL Procedure 151.1-01.08B, *Emergency Preparedness Training and Appointment of Emergency Responders*, 2/22/12
- NETL Procedure 151.1-01.11, *Employee Emergency Response Action Plan*, 8/10/12
- NETL Procedure 440.1-02.02D, *Chemical Inventory and SARA Title III Reporting*

Interviews

- Action Facilities Management MGN [Security] Commander
- Action Facilities Management PGH [Security] Commander
- Action Facilities Management Program Manager
- Action Facilities Management Security Dispatcher
- DOE/NETL General Engineer, Site Operations Division
- DOE/NETL Safety and Occupational Health Specialist
- DOE/NETL Security Specialists
- DOE/NETL Security/ERO Branch Supervisor
- Gold Belt Eagle Maintenance Supervisor
- MGN Facility Manager
- MGN Building 16 Facility Manager
- PGH Facility Manager
- PGH Building 65 Facility Manager
- URS Corporation (URS) Environment, Safety, and Health Program Manager
- URS Environment, Safety, and Health /Emergency Management Specialist
- URS Health Program Support Supervisor
- URS IC/Co-Director HAZMAT/Rescue Branch
- URS OHU Nurse
- URS Senior Hazards Analyst

Observations

- MGN chemical storage facilities (including Building 16) walkdowns
- MGN and PGH HAZMAT/Rescue Branch equipment storage walkdowns
- MGN and PGH OHU walkdowns
- MGN and PGH security dispatch center walkdowns
- PGN chemical storage facilities (including Building 65) walkdowns