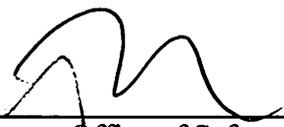


<p>U.S. Department of Energy</p> <p>Office of Safety and Emergency Management Evaluations</p> <p>Criteria Review and Approach Document</p>	<p>Subject: Emergency Management Program Inspection Criteria, Approach, and Lines of Inquiry</p> <p>Targeted Review of Site Preparedness for Severe Natural Phenomena Events</p>  <hr/> <p>Director, Office of Safety and Emergency Management Evaluations</p> <p>Date: 11/17/2011</p>  <hr/> <p>Criteria Lead, Emergency Management</p> <p>Date: 11/17/2011</p>	<p>HS: HSS CRAD 45-51 Rev: 0 Eff. Date: 11/17/2011</p> <p>Page 1 of 10</p>
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## 1.0 PURPOSE

Within the Office of Health, Safety and Security, the Office of Safety and Emergency Management Evaluations' mission is to assess the effectiveness of those emergency management systems and practices used by site organizations in implementing its emergency management program, and to provide clear, concise, and independent evaluations of performance in protecting workers, the public, and the environment from the hazards associated with Department of Energy (DOE)/National Nuclear Security Administration (NNSA) activities and sites.

A key to success is the rigor and comprehensiveness of our process; and as with any process, we continually strive to improve and provide additional value and insight to site activities. Integral to this is our commitment to enhance our program. We continue to make Criteria Review and Approach Documents available for use by DOE line and contractor assessment personnel in developing and implementing effective DOE oversight, contractor self-assessment, and corrective action processes; the current revision is available at <http://www.hss.energy.gov/IndepOversight/ESHE/docs.html>.

The focus of this Criteria Review and Approach Document is on evaluating processes for identifying emergency response capabilities and maintaining them in a state of readiness in the event of a large-scale natural phenomena event that exceeds the design basis of site facilities. The Office of Safety and Emergency Management Evaluations will perform this review in

accordance with DOE Order 226.1B, *Implementation of DOE Oversight Policy* using objectives derived from the functional requirements of DOE Order 151.1C, *Comprehensive Emergency Management System*. The Office of Safety and Emergency Management Evaluations will use the criteria and lines of inquiry contained herein to determine whether the objectives are met. The lines of inquiry were developed using the requirements contained in DOE Order 151.1C and the associated DOE emergency management guides.

## **2.0 APPLICABILITY**

The following Inspection Criteria document is approved for use by the Office of Safety and Emergency Management Evaluations.

## **3.0 FEEDBACK**

Comments and suggestions for improvements on these Inspection Criteria, Approach, and Lines of Inquiry can be directed to the Director of the Office of Safety and Emergency Management Evaluations on (301) 903-5392.

## **Emergency Management Program Inspection Criteria, Approach, and Lines of Inquiry**

### **Targeted Review of Site Preparedness for Severe Natural Phenomena Events**

#### **Background:**

The March 2011 disaster at the Fukushima Daiichi nuclear power plant emphasized the need to adequately plan and prepare for a large-scale event that could degrade or overwhelm a site's emergency response capability. DOE Order 151.1C, *Comprehensive Emergency Management System*, identifies the functional emergency response requirements for a DOE/NNSA site and the emergency management guides associated with DOE Order 151.1C, and provides guidance for implementing the requirements. Emergency planners at DOE sites determine needed site emergency response capabilities, which are based on site-specific attributes, such as types and forms of hazardous materials, demographics, and geography using a variety of deterministic analyses. For a hazardous material program, the primary means for determining needed response capabilities is through an emergency planning hazards assessment (EPHA); however, other site response capability needs are further analyzed in the fire department baseline needs assessment and security vulnerability assessments. Further, the analysis contained in the EPHA should represent a spectrum of events that represent plausible hazardous material release scenarios such as operator errors, mechanical failures, fires, and explosions from unintentional or intentional initiators. Many of these scenarios are also analyzed and used to reduce the probability of risk from a nuclear facility's operations to acceptable levels in its documented safety analysis (DSA), known as design basis events; however, DSAs do not analyze severe events when establishing a facility design if the events are considered to be beyond credible. To address the small possibility of a beyond design basis event occurring, emergency response staff must prepare for its occurrence by planning a means to provide for the immediate protection of personnel and mitigation of the consequences of a potential hazardous material release. Beyond design basis events include severe natural phenomena events that represent the upper end of the consequence spectrum that DOE facilities are required to prepare for in accordance with DOE Order 151.1C. Preparations include: alternate emergency response facilities, redundant and diverse communications systems for use when an event renders the primary facilities and equipment unavailable, and other site-specific planning and response capabilities needed for a comprehensive emergency management program.

Some necessary response capabilities that emergency planners may identify for the most severe and low probability events would be a financial burden to maintain on-site or could be unavailable based on the nature or severity of the event. For these types of capabilities, emergency planners preplan a means to acquire them from external sources such as surrounding communities, state authorities, and off-site DOE and national assets. In order to adequately prepare for an event that requires off-site assets, the site should have formal agreements with off-site entities to identify capabilities, preplan mechanisms to acquire them, and procedures to receive and integrate them into the emergency response.

This emergency management program targeted review will evaluate the comprehensiveness of response capabilities identified in the beyond design basis event analysis performed by the site

and the level of preparedness in attaining and maintaining those response capabilities. Of particular interest is the site's preparedness for responding to plausible severe natural phenomena events. Important considerations include:

- The severity of events that serves as the basis for the site's emergency response capability;
- The timely recognition that an event exceeds the site's response capability;
- The ability of the site to perform required emergency response functions during severe natural phenomena events; and
- The planning for obtaining off-site response assets and mechanisms for acquiring and integrating off-site response assets when needed.

The following provides the objectives, inspection criteria, activities, and specific lines of inquiry that will be used to conduct the review.

**Objective 1: The site analyzes plausible scenarios representing severe natural phenomena events to determine capabilities needed for an effective emergency response.**

**Inspection Criteria:**

- Hazards surveys identify site threats from natural phenomena events.
- EPHAs analyze the consequences from natural phenomena events.
- Analyzed natural phenomena events include beyond design basis events.
- EPHAs and other emergency planning documents identify emergency response capabilities needed to mitigate analyzed events.
- The analyses contained in EPHAs, fire department baseline needs assessment, and security vulnerability assessment, determine the capabilities needed for the emergency response organization (ERO).

**Inspection Activities:**

- Review selected nuclear facility safety basis documents (e.g., DSAs, Bases for Interim Operations) to determine the design basis events.
- Review applicable hazards surveys to determine whether natural phenomena events are considered.
- Review the fire department baseline needs assessment and security vulnerability assessment to determine the basis for fire department and security force capabilities.
- Review applicable EPHAs to determine whether natural phenomena events were analyzed as initiating events.
- Interview personnel responsible for developing, reviewing, and maintaining these documents.

**Lines of Inquiry:**

- Does each hazards survey:
  - Identify the generic types of serious emergency events or conditions (e.g., wildfires, flood, tornadoes, earthquakes, wind, and snowstorms that could result in hazardous material releases) that affect the facility?
  - Indicate the need for further analyses of hazardous materials in an EPHA when consequences warrant?

- Are natural phenomena events used as initiating events in the EPHAs derived from historical data or consistent with events analyzed in the DSAs?
- Are natural phenomena events identified in the hazards survey and analyzed in the EPHA to identify the potential consequences from unplanned releases (or loss of control over) hazardous materials?
- Do natural phenomena events analyzed in the EPHA go beyond the events analyzed in the DSA?
- Is the planned ERO capability based on the bounding events analyzed in EPHAs and the fire department baseline needs assessment?
- Does the protective force response capability include support of planned emergency response activities associated with natural phenomena events?

**Objective 2: The site has a means for determining quickly whether an event results in the loss of a significant quantity of hazardous material and is beyond the site's capability to respond.**

**Inspection Criteria:**

- Emergency action levels (EALs) identify natural phenomena events that may cause a significant barrier failure for process buildings that contain a dispersible form of hazardous material.
- EALs include plausible severe events (such as a multiple dam breaks that would flood an entire site) where analysis concludes that such events would overwhelm or incapacitate the site's response capability.

**Inspection Activities:**

- Review EPHAs to determine whether plausible severe events with consequences that would overwhelm or incapacitate the site's response capability were identified.
- Review EALs to determine whether a method for early recognition of significant barrier failure is included.
- Review EALs to determine whether identified events known to result in overwhelming the site's response capability provide for the immediate declaration of a General Emergency and the transmittal of off-site notifications.
- Interview personnel responsible for developing, reviewing, and maintaining EAL and EPHA documents.

**Lines of Inquiry:**

- Do EPHAs identify plausible events with consequences that would overwhelm or incapacitate the site's capability to respond?
- Do EPHA analyses consider consequences from off-site hazards that could affect the site?
- For events where the site's capability to respond is rendered ineffective, are there EALs with General Emergency classifications available?
- Are there EALs available to identify the loss of a significant release barrier, such as a process building's infrastructure, for plausible events that exceed the design of the barrier?

**Objective 3: The site's emergency response capabilities are in a state of readiness to perform its required emergency response functions during plausible natural phenomena events.**

**Inspection Criteria:**

- A facility is available for use as a command center.
- The site adequately maintains designated response facilities, especially multiuse facilities.
- The site provides for the use of an alternate location if the primary command center is not available.
- Adequate personal protective equipment and other equipment and supplies are available and operable to meet the needs determined by the results of the EPHA.
- The site identifies, monitors, and acquires facilities and equipment sufficient to meet requirements.
- The site has adequate available, operable, and maintained facilities and equipment to support emergency response.
- The site maintains inventories of all emergency equipment and supplies in identified locations.
- The site performs periodic inspections, operational checks, calibration, preventive maintenance, and testing of equipment and supplies to ensure facilities and equipment are available and operable in the event of an operational emergency.
- The site has adequate facilities and equipment to support emergency response, including the capability to notify employees of an emergency and to facilitate the safe evacuation of employees from the work place and immediate work area.
- The site assigns an individual (i.e., building or facility manager) to manage and control all aspects of the site/facility response.
- The site establishes and maintains an ERO with overall responsibility for the initial and ongoing response and mitigation of an emergency.
- Control at the event/incident scene is consistent with the National Incident Management System/Incident Command System, which integrates local agencies and organizations that provide on-site response services.

**Inspection Activities:**

- Review EPHAs to determine if analyzed natural phenomena events could result in the loss of emergency response command facilities.
- Review procedures, checklists, and records, used to determine the location of resources and perform testing and maintenance of equipment, as necessary.
- Interview personnel responsible for testing and maintenance of equipment, as necessary.
- Perform walkdowns of facilities and equipment to validate the state of readiness, as necessary.
- Review EPHAs, the fire department baseline needs assessment, and security vulnerability assessment to determine the capability needs of the ERO.
- Review ERO duty rosters to determine if the ERO has sufficient depth to staff ERO positions for analyzed events.

**Lines of Inquiry:**

- Are there designated facilities for use as emergency response command centers?
- Is a facility available for use as a viable command center by the emergency director, the emergency management team, and other members of the ERO during an emergency response?
- Are emergency response command facilities that are expected to provide long-term protection to its inhabitants properly equipped with habitability systems?
- Are habitability systems properly tested, including filter testing at an approved filter test facility, maintained, and ready to be placed in service?
- Are the characteristics of the dedicated command center, and other auxiliary facilities, adequate to reliably support the designated functions and assignments?
- Are provisions made for use of an alternate location if the primary command center is not available?
- Do emergency response facilities use backup or alternate power supplies in the event of loss of power?
- Are emergency generators powering emergency response loads tested and maintained in accordance with industry standards and vendor recommendations?
- Is all equipment critical to an emergency response loaded on the emergency power supplies?
- Are there adequate plans for refueling emergency generators operating under extended emergency operations?
- Are uninterruptible power supplies powering emergency response loads tested and maintained in accordance with industry standards and vendor recommendations?
- Are designated response facilities, especially multi-use, backup facilities, or mobile facilities, adequately maintained to ensure timely activation and availability to support an emergency response?
- Do drills and exercises demonstrate the conversion of facilities to emergency response facilities in a timely and efficient manner?
- Are communication systems used to activate both on-shift and off-shift emergency response personnel tested and maintained regularly?
- Does each command and control center have adequate communications to perform its notification and command functions with consideration of degraded conditions from severe events?
  - Secure and non-secure telephones
  - Classified and unclassified information management systems/networks
  - Radio base station and/or land-mobile radios
  - Compatible/interoperable communication systems with site and local emergency responders
  - Secure and non-secure facsimile machines.
- Are dedicated primary and backup voice communications links provided between key emergency response facilities?
- Are sufficient non-dedicated voice communication links provided to access off-site organizations?
- Is there the capability to notify employees of an emergency from command centers to facilitate the safe evacuation of employees from the work place and immediate work area?

- At the process facilities, are communications systems effective to support management and tracking of evacuation of facility personnel, personnel accountability and assembly?
- Are communication systems with DOE Headquarters, Operations/Field offices and off-site organizations periodically tested?
- Are provisions established to ensure operational compatibility between facility response capabilities and DOE/NNSA assets?
- Is Command Center access control adequate and does it result in the efficient and timely identification of assigned staff?
- At process facilities, are buildings and area alarms or public address systems designed, installed, and maintained to alert facility personnel to emergency conditions?
- At process facilities, are there mechanisms and procedures that address:
  - A method to safely close the outside air intake?
  - A method to shut down the HVAC following a hazmat incident and whether this would be done manually, automatically, or centrally from an Energy Management Control System?
  - A method for sealing off the building/assembly area by closing doors and windows, turning off ventilation fans, sealing cracks, etc.?
  - Facilities that can serve as shelter from windborne missiles?
- Are facility systems and installed equipment adequate to support facility functions and level of staffing?
- Do the actual function(s) and operating characteristics of specific equipment adequately support the intended function(s) during emergency response?
- Are adequate personnel protective equipment, and other emergency equipment and supplies, readily available and operable to meet the needs determined by the results of the EPHA?
- Are periodic inspections, operational checks, calibration, preventive maintenance, and testing of equipment and supplies carried out as required in accordance with manufacturer's instructions or industry standards?
  - Radiation detectors
  - Hazardous material detectors
  - Decontamination equipment
  - Seismic monitors.
- Are inventories of all emergency equipment and supplies maintained with the equipment location identified?
- Are specialized facilities and equipment that are essential to emergency response appropriately identified for process facilities?
- Has the site established and maintained an ERO with overall responsibility for initial and ongoing emergency response and consequence mitigation and determination, for each facility/site?
- Does the ERO have effective control mechanisms at the scene of an event/incident and are ERO activities integrated with those of local agencies and organizations that provide on-site response services?
- Are an adequate number of experienced and trained personnel, including designated alternates, available on demand for timely and effective performance of ERO functions?
- Are special response functions and teams (e.g., fire, hazmat, emergency medical, rescue, etc.) addressed in the context of staffing and interactions within the ERO?

- Are preplanned protocols used (e.g., use of deadly force, weapons employment, tactics, code words, radio frequencies, etc.) when local law enforcement provides backup to the on-site security force?
- Are the fire department, hazardous material response teams, security force, and field monitoring teams staffed and equipped consistent with identified capabilities?
- Has the contractor assigned an individual (e.g., building or facility manager or similar position) to manage and control all aspects of the site/facility response?
- Are control mechanisms at an event/incident scene consistent with the National Incident Management System/Incident Command System, which integrates local agencies and organizations that provide on-site response services?

**Objective 4: The site's planning is adequate for obtaining and integrating off-site response assets for events beyond the site's response capability.**

**Inspection Criteria:**

- The site establishes and maintains effective interfaces to ensure the integration and coordination of emergency response activities with Federal, tribal, state, and local agencies and organizations responsible for emergency response and protection of the workers, public, and environment.
- The site establishes, documents, and tests the interfaces with each agency and organization.
- The site uses hazards survey and EPHA results to develop a list of emergency services, which may be needed to respond to potential accident conditions such as required services from hospitals, fire departments, law enforcement, accident investigation, analytical laboratory services, ambulance services, and coroners.
- The site identifies off-site response agencies and organizations responsible for augmenting site response resources.
- Support agreements are in place that identify the resources, the on-site personnel authorized to request off-site resources, the off-site individuals authorized to implement the arrangement, the points-of-contact, and any information required for implementation, such as names and telephone numbers.

**Inspection Activities:**

- Review emergency plans, implementing procedures, memorandum of understanding, and mutual aid agreements.
- Interview DOE/NNSA Field Element and contractor personnel responsible for establishing and maintaining interfaces with off-site authorities.

**Lines of Inquiry:**

- Are agreements to provide mutual assistance or to receive assistance from off-site organizations documented in formal memorandum of agreement, memorandum of understanding, or similar mutual aid agreements?
- Does the site/facility, through formal agreements, support off-site agencies under the "good neighbor" policy in areas of emergency assistance including fire, medical, and hazmat releases (including field monitoring resources)?
- Are off-site authorities informed of the availability of assistance from DOE/NNSA national assets?

- Is the site emergency response plan compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and Federal agencies?
- Have organizations that may be needed in a supporting role and/or needed for long-term support been identified?
- Have pre-designated off-site points of contact, including organization, names, and phone numbers been documented, maintained, and made available to the response organization?
- Is effective coordination with off-site response agencies and organizations accomplished and maintained through routinely scheduled meetings?
- Does routine coordination and interfaces through training, drills, and good neighbor support ensure that off-site services as indicated in documented agreements will be integrated with on-site resources?
- Are methods of communication and communication protocols with off-site agencies/organizations in place, identified and operable?
- Do communication capabilities allow effective communication with off-site officials, the cognizant DOE Field Element and Headquarters Emergency Management Team?
- Are off-site response organizations invited to participate in a site-level exercise at least every 3 years?
- Are assumptions for off-site emergency response support periodically tested?
- Do support agreements detail the following?
  - The specific service and/or resources to be provided.
  - The agency, organization, or jurisdiction to which it applies.
  - On-site individuals authorized to request aid from the off-site agency, organization, or jurisdiction.
  - Off-site individuals authorized to implement the arrangement, points-of-contact, and information required for implementation, such as names and telephone numbers.
  - Financial arrangements, including commitments by the facility or site to provide training, equipment, and facilities to the entity providing the service, and indemnification for injury to persons for loss and damage to property.