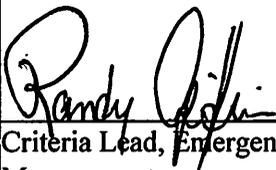


U.S. Department of Energy	Subject: Emergency Management Program Inspection Criteria, Approach, and Lines of Inquiry Review of Preparedness for Severe Natural Phenomena Events at the Savannah River Site Tritium Facility 	HS: HSS CRAD 45-54 Rev: 0 Eff. Date: 08/21/2012
Office of Safety and Emergency Management Evaluations	Acting Director, Office of Safety and Emergency Management Evaluations Date: 08/21/2012	Page 1 of 9
Criteria Review and Approach Document	 Criteria Lead, Emergency Management Date: 08/21/2012	

1.0 PURPOSE

Within the Office of Health, Safety and Security (HSS), the Office of Safety and Emergency Management Evaluations' mission is to assess the effectiveness of those emergency management systems and practices used by site/facility 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) sites, facilities and activities.

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/facility activities. Integral to this is our commitment to enhance our program. We continue to make Criteria Review and Approach Documents (CRADs) 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.doe.gov/indepoversight/safety_emergencymgt/guidance.html.

The focus of this CRAD is on evaluating processes for identifying emergency response capabilities and maintaining them in a state of readiness in case a severe natural phenomena event occurs that exceeds the design basis of the Savannah River Site (SRS) tritium facility. This CRAD is intended to ensure that the NNSA SRS Site Office (SRSO) plans, procedures, and performance identified in DOE Order 151.1C, *Comprehensive Emergency Management System*, and the Contractors Requirements Document (CRD) identified in the order are met for work conducted at the tritium facility.

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 151.1 C. 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 151.1 C 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 Acting Director of the Office of Safety and Emergency Management Evaluations on (301) 903-5392.

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

Review of Facility 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 151.1 C, *Comprehensive Emergency Management System*, identifies the functional emergency response requirements for a DOE/NNSA site/facility and the emergency management guides associated with DOE Order 151.1 C provides guidance for implementing the requirements. Emergency planners at DOE/NNSA sites/facilities 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.

The consequence analyses contained in the EPHA should present 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 the site 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 the design basis of the facility. 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 151.1 C. Preparations include: primary and alternate emergency response facilities, redundant and diverse communications systems for use when an event renders the primary facilities and equipment unavailable, and other site/facility-specific planning and response capabilities needed for a comprehensive emergency management program.

This emergency management program review will evaluate the comprehensiveness of response capabilities identified in the beyond design basis event analysis performed by the tritium facility and the level of preparedness in attaining and maintaining those response capabilities. Of particular interest is the facility's preparedness for responding to plausible severe natural phenomena events, and the site's integration and coordination with that response. Important considerations include:

- The severity of events at the tritium facility that serves as the basis of the emergency response capability;
- The timely recognition that an event at the tritium facility exceeds the site's response capability;
- The ability of the personnel at the tritium facility to perform required emergency response functions during severe natural phenomena events; and
- The effectiveness of the SRSO to periodically review and evaluate the contractor-operated tritium facility to meet requirements of the Emergency Management System.

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

Objective 1: Plausible scenarios representing severe natural phenomena events at the tritium facility are analyzed to determine capabilities needed for an effective emergency response.

Inspection Criteria:

- The facility hazards survey identifies threats from natural phenomena events.
- The facility EPHA analyzes the consequences from natural phenomena events.
- Analyzed natural phenomena events for the facility include beyond design basis events.
- The facility EPHA and other emergency planning documents identify emergency response capabilities needed to mitigate analyzed events.
- The analyses contained in the facility EPHA determine the capabilities needed for the emergency response organization (ERO).

Inspection Activities:

- Review the facility safety basis documents (e.g., the DSA) to determine the design basis events.
- Review the facility hazards survey to determine whether natural phenomena events are considered.
- Review the facility EPHA to determine whether natural phenomena events were analyzed as initiating events.
- Interview personnel responsible for developing, reviewing, and maintaining facility technical basis documents.

Lines of Inquiry:

- Does the facility 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 facility EPHA derived from historical data or consistent with events analyzed in the DSA?
- Are natural phenomena events identified in the facility hazards survey and analyzed in the facility EPHA to identify the potential consequences from unplanned releases (or loss of control over) hazardous materials?
- Do natural phenomena events analyzed in the facility EPHA go beyond the events analyzed in the DSA?
- Is the planned ERO capability based partly on the bounding events analyzed in the facility EPHA?

Objective 2: A mechanism is provided for determining quickly whether an event at the tritium facility results in the loss of a significant quantity of hazardous material and is beyond the site's capability to respond.

Inspection Criteria:

- Facility emergency action levels (EALs) identify natural phenomena events that may cause a significant barrier failure for the facility that contains a dispersible form of hazardous material.
- Facility 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 the facility EPHA to determine whether plausible severe events with consequences that would overwhelm or incapacitate the site's response capability are identified.

- Review facility EALs to determine whether a method for early recognition of significant barrier failure is included.
- Review facility 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 facility EAL and EPHA documents.

Lines of Inquiry:

- Does the facility EPHA identify plausible events with consequences that would overwhelm or incapacitate the site's capability to respond?
- Does the facility 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 facility EALs with General Emergency classifications available?
- Are facility EALs available to identify the loss of a significant release barrier, such as the facility's infrastructure, for plausible events that exceed the design of the barrier?

Objective 3: The site and tritium facility have the emergency response functions and equipment necessary to maintain a viable, integrated, and coordinated response to plausible natural phenomena events.

Inspection Criteria:

- A facility is available for use as a command center.
- The site adequately maintains designated response facilities, especially multi-use 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 facility EPHA.
- The site identifies, monitors, and acquires facilities and equipment sufficient to meet requirements.
- The site has adequate available, operable, and maintained response facilities and equipment to support the facility.
- The facility maintains inventories of all emergency equipment and supplies in identified locations at the facility.
- Periodic inspections, operational checks, calibration, preventive maintenance, and testing of equipment and supplies are performed to ensure response facilities and equipment are available and operable in the event of an facility operational emergency.
- The site has adequate response facilities and equipment to support a facility 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.
- Control of the scene at the facility 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 the facility EPHA 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 facility equipment, as necessary.
- Interview personnel responsible for testing and maintenance of facility equipment, as necessary.

- Perform walkdowns of facility emergency response facilities and equipment to validate the state of readiness, as necessary.
- Review the facility EPHA and determine if it was used to establish the capability needs of the ERO.
- Review ERO duty rosters to determine if the ERO members from the facility have sufficient depth to staff ERO positions for analyzed events.

Lines of Inquiry:

- Are there designated facilities for use as emergency response command centers for a facility event?
- 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 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 at the facility loaded on the emergency power supplies?
- Are there adequate plans for refueling emergency generators operating under extended emergency operations at the facility?
- Are uninterruptible power supplies powering facility 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 at the facility?
- Does each command and control center have adequate communications to perform its notification and command functions with consideration of degraded conditions from severe events at the tritium facility?
 - Secure and non-secure telephones.
 - Classified and unclassified information management systems/networks.
 - Secure and non-secure facsimile machines.
 - Are dedicated primary and backup voice communications links provided between key emergency response facilities?
 - 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 facility, are communications systems effective to support management and tracking of evacuation of facility personnel, personnel accountability, and assembly?
- At the facility, are buildings and area alarms or public address systems designed, installed, and maintained to alert facility personnel to emergency conditions?
- At the facility, are there mechanisms and procedures that address:
 - A method to safely close the outside air intake?
 - A method to shut down the heating, ventilation, and air conditioning 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 facility 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 facility EPHA?
- Are periodic inspections, operational checks, calibration, preventive maintenance, and testing of equipment and supplies used to respond at the facility 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 facility emergency equipment and supplies maintained with the equipment location identified?
- Are specialized facilities and equipment that are essential to emergency response appropriately identified for the facility?
- Has the site established and maintained an ERO with overall responsibility for initial and ongoing emergency response and consequence mitigation and determination for the facility?
- Does the ERO have effective control mechanisms at the scene of a facility event?
- Are an adequate number of experienced and trained personnel, including designated alternates, available on demand for timely and effective performance of ERO functions at the facility?
- Are special facility response functions and teams (e.g., fire, hazmat, emergency medical, rescue, etc.) addressed in the context of staffing and interactions within the ERO?
- Are the fire department, hazardous material response teams, security force, and field monitoring teams staffed and equipped consistent with identified capabilities for a response to a facility operational emergency?
- Has the contractor assigned an individual (e.g., building or facility manager or similar position) to manage and control all aspects of the facility response?

Objective 4: The NNSA Savannah River Site Office (SRSO) periodically reviews and evaluates the ability of the NNSA contractor-operated tritium facility to meet requirements of the Emergency Management System.

Inspection Criteria:

- The SRSO ensures the contractor's programs and processes are in accordance with the policy and key elements outlined in DOE Policy 226.1; DOE Order 226.1, Attachment 3; quality assurance requirements (as stated in 10 CFR 830, Subpart A, or other applicable regulations); applicable DOE Directives; and contract terms and conditions.
- The SRSO ensures an integrated Operational Emergency Hazardous Material Program has been developed based on the findings of the facility Hazards Survey and approves:
 - The facility EPHS
 - The facility EPHA
 - The Emergency Planning Zone that ensures input from the facility EPHA
 - ERAP that ensures input from activities at the facility

- The SRSO ensures that emergency plans and procedures for the facility are prepared, reviewed annually, and updated, as necessary, and are integrated within the overall emergency preparedness program for facilities under their purview.
- The SRSO ensures resources are available to implement the requirements of DOE O 151.1C for facilities and activities at the facility.
- The SRSO has implemented procedures to define expectations and requirements for an emergency management program at the facility.
- The SRSO performs a self-assessment of their emergency management program responsibilities at the facility annually and records the results in the SRSO portion of the ERAP.
- The SRSO performs assessments of all facility emergency management program elements at least once every 3 years and reviews contractor self-assessment program activities affecting the facility annually.
- The SRSO implements effective mechanisms for the managing of corrective actions from evaluations, assessments, and appraisals and lessons learned from facility training, drills, actual responses, and findings.

Inspection Activities:

- Review facility technical planning bases documents (e.g., Hazards Survey, EPHA, the hazards screening process) and the emergency plan, emergency plan implementing procedures (EIPs), and associated analyses.
- Review documentation related to oversight and assessment (e.g., completed program assessments and exercise evaluations, causal analyses and corrective action plans, verification/validation records, and effectiveness determinations).
- Review plans and procedures related to the SRSO emergency management functions for response at the facility, including emergency response actions.
- Review training and qualification records and interview personnel to determine their familiarity with their responsibilities and with emergency plans, EIPs, and other job aids used at the facility.
- Interview SRSO managers and staff to determine how oversight activities, including assessments, are planned and performed, and their use in improving performance at the facility.
- Review trend analysis and performance indicator reports and evaluate the analyses, conclusions, and any related corrective actions at the facility.

Lines of Inquiry:

- Does the SRSO use a formal review and approval processes established and documented to ensure that the planning and development of components of the emergency management program (e.g., planning analyses, plans and procedures, supporting documentation) receive sufficient oversight by staff, management, and DOE elements to ensure consistency, correctness, and completeness?
- Does the SRSO have formal and documented oversight plans that include assessments, operational awareness activities, performance monitoring and improvement, and assessment of the contractor readiness assurance program? Is the mix of informal and formal oversight activities appropriate?
- Have responsible personnel performed oversight activities at the facility in accordance with the oversight plan?
- Does the SRSO review and approve portions applicable to the facility of:
 - The site Emergency Plan
 - EPHS and triennial updates
 - EPHAs and triennial updates
 - Input to the Emergency Planning Zone (EPZ) document
 - Annual ERAP?

- Does the SRSO have a procedure assigning responsibility for approving the hazards surveys and EPHAs?
- Does the SRSO ensure that emergency plans and EIPs are prepared, reviewed annually, and updated (as necessary), including those governing NNSA actions during an operational emergency for the facility?
- Are resources needed at the facility for providing an adequate level of emergency management support being communicated to line management and is management responsive to resource needs and concerns?
- Has the SRSO set expectations for the facility and communicated them to contractors through formal contract mechanisms, metrics, and performance incentives?
- Are performance measures for the emergency management program at the facility identified and included in the contract performance incentives?
- Are the facility performance measures objective and do evaluations of performance reflect critical evaluation of the contractor's performance?
- Have the performance incentives led to improved contractor performance at the facility?
- Does the SRSO monitor contractor performance and assess whether the contractor met performance expectations, and that the contractor is assessing site activities adequately; self-identifying deficiencies; and taking timely and effective corrective actions at the facility?
- Has the SRSO established an effective self-assessment and readiness assurance program for emergency management program functions at the facility?
- Does the SRSO assess the SRSO emergency management program for the facility annually and record the results of the self-assessment in the NNSA Site Office portion of the ERAP.
- Has self-assessment activities been effective in identifying weaknesses in the SRSO's emergency management program and performance at the facility?
- Does the SRSO assess all elements of the contractor's emergency management program at the facility at least once every 3 years and the contractor self-assessment program annually?
- Have the oversight activities been effective in identifying weaknesses in the contractor's emergency management program and performance at the facility?
- Have issues identified during previous reviews at the facility (e.g., CDNS Biennial Reviews, HSS reviews, self-assessments) been appropriately resolved, corrective actions have been completed and are adequate, or a clear path to completion is indicated?
- Are issues identified at the facility evaluated and appropriately entered into an issues tracking and management system under the control of the SRSO?
- Are responsible NNSA line managers briefed periodically on the results of facility oversight activities and the status of corrective actions?
- Does the SRSO have a process or procedure in place to independently verify and validate corrective actions, both contractor and NNSA?
- Has the SRSO ensured and/or verified the following at the facility:
 - Deficiencies in programs or performance identified during operational awareness activities are communicated to the contractor for resolution through a structured issues management process?
 - Findings are tracked and resolved through structured and formal processes, including provisions for review of corrective action plans?
 - Line management reviews completion of corrective actions, which includes a verification and validation process, independent of those who performed the corrective action, to verify that the corrective action has been put in place and validate that the corrective action has been effective in resolving the original finding?
- Are the responsibilities of the SRSO manager for emergency management at the facility clearly defined, documented, and understood?
- Do SRSO personnel meet the training, drills, and exercises criteria required for facility ERO members?