CHARLOTTE SHIELDS
Senior Project Manager, Nuclear Security and Incident Preparedness

1201 F Street, NW, Suite 1100
Washington, DC 20004
P: 480.737.5876
cls@nei.org
nei.org

NUCLEAR ENERGY INSTITUTE

March 22, 2022

Mr. Jessie Quichocho
Chief, Reactor Licensing Branch
Division of Preparedness and Response
Office of Nuclear Security and Incident Response
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: NEI White Paper, "Enabling a Remote Response by Members of an Emergency Response Organization"

Project Number: 689

Dear Mr. Quichocho:

The Nuclear Energy Institute[1] and representatives of member companies have developed the attached white paper to provide guidance that may be used by a licensee to enable members of an Emergency Response Organization to remotely respond to an emergency. This version of the white paper, Draft D, addresses the NRC staff comments on Draft C, which were discussed during a public meeting on December 15, 2021.

We request an opportunity to discuss Draft D in a public meeting to obtain the NRC staff's feedback on the document. Following resolution of staff comments, we will submit the white paper as Revision 0 with a request for NRC review and endorsement.

[1] The Nuclear Energy Institute (NEI) is the organization responsible for establishing unified industry policy on matters affecting its members, including the regulatory aspects of generic operational and technical issues. NEI's members include entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel cycle facilities, suppliers and nuclear materials licensees, nuclear medicine and radiopharmaceutical companies, companies using nuclear technologies in the agricultural, food, and industrial sectors, universities and research laboratories, law firms, labor unions, and international electric utilities.

If you have questions or require additional information, please contact me at (480) 737-5876 or cls@nei.org.

Sincerely,

Charlotte Shields

Attachment

c: Mr. Clay Johnson, NSIR/DPR, NRC
Mr. Ray Hoffman, NSIR/DPR/RLB, NRC

NEI WHITE PAPER

Enabling a Remote Response by Members of an Emergency Response Organization

Revision D

Prepared by the Nuclear Energy Institute
March 2022

Acknowledgements

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NEI Project Lead: Charlotte Shields

NEI technical assistance: David Young

Member representatives:

Steve Barr - PSEG

Ed Collins – Dominion Energy

John Egdorf – Proactive Planning, LLC

Ashley Rickey – Constellation Nuclear

David Simmons - Southern Nuclear

Zach Smith – Constellation Nuclear

Tyler Swearingen – Dominion Energy

Liz Williford – Southern Nuclear

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1 PURPOSE

This white paper provides guidance that may be used by a licensee to enable members of an Emergency Response Organization (ERO) to respond remotely to an emergency. The guidance provides recommended actions to maintain the effectiveness of an ERO and compliance with the requirements in U.S. Nuclear Regulatory Commission (NRC) regulations and a site emergency plan.

2 BACKGROUND

As used in this white paper, a "remote response" is defined as**:**

> An ERO member responding to an emergency from a location other than the physical Emergency Response Facility (ERF) to which the member is assigned.

Each nuclear power plant site currently maintains an ERO to respond to emergencies; however, enabling a remote response by some ERO positions can enhance overall response capabilities through:

- Faster response times by ERO members since travel to an ERF is not necessary.
- Expanding the pool of potential ERO members with individuals possessing desirable expertise but who cannot currently be assigned because their travel time does not support required position augmentation or ERF activation times.
- Allowing a larger ERO response since multiple ERO members in a position can respond and provide support; this type of response may currently be prohibited due to physical facility space and occupancy limits.

ERO members responding remotely to an emergency must be capable of completing all functions and tasks assigned to their position, including support provided to other ERO members, as described in the site emergency plan, and implementing procedures. Implementation of a remote response capability for ERO members does not mean that physical ERFs can be eliminated. Each licensee will maintain the physical Technical Support Center (TSC), Operational Support Center (OSC), Emergency Operations Facility (EOF), and Joint Information Center (JIC), as described in the site emergency plan.

3 REGULATORY REVIEW

Title 10 of the Code of Federal Regulations (10 CFR) 50.47 (b)(2) requires that an onsite emergency plan meet the following standard:

> "On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support and response activities are specified."

Additional requirements related to a site ERO are found in, 10 CFR 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities."

The NRC staff determines compliance with the requirements in 10 CFR 50.47 and 10 CFR 50, Appendix E, through a review of a licensee's emergency plan commitments and capabilities against the criteria specified in:

- NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, or
- NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 2.

The applicable criteria are presented in Section II, "Planning Standards and Evaluation Criteria," under Planning Standard B.

A review of the applicable requirements and guidance performed by NEI and industry members, did not identify any obstacle to implementing a remote response capability; however, each licensee will need to assess potential changes to their site emergency plan in accordance with the requirements of 10 CFR 50.54(q), "Emergency plans." In some cases, the changes necessary to implement a remote response capability could require prior NRC approval through a license amendment request (LAR). Licensees are encouraged to engage their regional emergency preparedness (EP) inspectors on plans for implementing a remote response capability and, in cases where a LAR will be submitted, request a pre-submittal conference call through the site's NRC Project Manager.

4 GENERAL APPROACH

The approach described in this white paper permits a licensee to utilize communication, collaboration, and data sharing technologies to enable a remote response by selected ERO members. The recommendations in this white paper address the following key considerations when implementing a remote response capability:

- Identification of ERO positions with assigned functions and tasks that can be successfully performed in a remote response environment.
- Maintaining compliance with regulatory requirements applicable to a site ERO.
- Evaluating changes to the site emergency plan.

The following sections present topics to consider when implementing a remote response capability.

5 ASSESSMENT OF POSITIONS FOR A REMOTE RESPONSE

An ERO position is a candidate for a remote response if it can be shown that all position functions and tasks described in the site emergency plan and implementing procedures can be adequately performed from a remote location. It is recognized that some ERO positions cannot respond remotely due to the nature of assigned functions and tasks. For example, a remote response would not be suitable for a position required to physically manipulate plant equipment or take other physical actions at the site. Also, positions responsible for overall ERO and ERF-specific command and control (e.g., a TSC Emergency Director) are not candidates for a remote response since a leadership presence is needed in their

assigned facilities.

When assessing an ERO position to determine if a remote response is feasible, a licensee should perform a review of the site emergency plan and implementing procedures, and document the following:

- The assigned functions and tasks (these can be identified through use of the task analysis process employed to develop ERO training).
- The technology(ies) that will be used to enable a remote response (e.g., audio/visual communications, data acquisition, etc.).
- The procedural instructions that will be added or changed to ensure that each assigned function and task can be adequately performed.

When gathering information for a position assessment, the licensee is strongly encouraged to conduct interviews with the affected ERO members to ensure that all aspects of their physical response are understood and accounted for in the change plan. For example, the anticipated use of a given communication or data acquisition method should be discussed with position-holders to verify that the method will be sufficient to support performance of their assigned functions and tasks. The adequacy of the methods will be validated in a drill, as discussed below under "Changes to Emergency Plan and Implementing Procedures."

The assessment of an ERO position should also address the impact that a remote response could have on a position's supervisory role, if any, or the ability to effectively function within an assigned team (e.g., a dose assessment team). In addition, response actions unique to certain types of events should also be considered. For example, during an emergency due to a Hostile Action, certain positions may need to access Safeguards Information or communicate over a secure line. The measures to mitigate identified impacts or address event-specific response actions should be documented.

Here is a suggested assessment format:

ERO Position	Assigned functions and task	Technology(ies) to enable remote response	Plan, procedure(s), process changes to be added or changed to support remote response

When complete, the assessment results can be used as an input for the identification of new or revised ERO training materials, as discussed below under "Training, Qualification, and Drills."

6 COMMUNICATION METHODS

An important element of an effective emergency response is communications; therefore, a site should have communication methods that permit effective interface between remotely responding individuals

and ERO members located in ERFs. The selection of a communication method for a given ERO position is dependent on the position's assigned functions and tasks. The selected method should ensure that a remote ERO member can:

- obtain information necessary to perform assigned functions and tasks, and
- provide information needed by others to perform their assigned functions and tasks.

To support coordinated teamwork and timely sharing of information, a collaboration platform[1] should be available to support ERO operations. This platform should possess the following features:

- Audio/visual communication between users
- Ability to share screens/documents
- Ability to grant access to outside agencies or organizations, if desired
- Backup phone communication capability

Communication methods should have the requisite connection and data transfer capacity to handle all reasonably expected communication needs and be highly reliable.[2] When appropriate to the technology, the selection of a communication method should also consider the ability of the vendor or company Information Technology (IT) department to push out software updates and notifications of system/platform outages.

7 SPECIALIZED APPLICATIONS

To respond remotely, certain ERO positions will need the capability to access the computer applications they would use in an ERF to perform their emergency response functions. Such applications may include:

- WebEOC (or an equivalent)
- Plant document management system
- Plant computer system and meteorological data display
- Dose assessment model
- Core damage assessment tool

The specialized applications needed by a given ERO position should be identified during the analysis described above in the "Assessment of Positions for a Remote Response" section. Additionally, the needs of each position should be assessed in the training analysis discussed in the "Training, Qualification, and Drills" section below.

[1] As used in this white paper, a collaboration platform is an information technology tool that allows real-time audio-visual communications and document sharing.

[2] It is noted that NUREG-0696, "Functional Criteria for Emergency Response Facilities," recommends an unavailability goal of 0.01 for ERF equipment when the reactor is above cold shutdown mode. This means that a selected communication method should not be unavailable for more than 88 hours in a year.

Making an application available can be done in several ways. For example, an application could be installed locally on an ERO member's computer or be accessed remotely via a Virtual Private Network (VPN) or cloud computing connection. The licensee will need to determine the best method to use for each application. Whatever method is used, the licensee should ensure that responders can access the necessary applications and have controls in place to ensure that the applications are the correct version. Updates/upgrades to software and hardware used by remote responders should be controlled in a manner consistent with site IT requirements.

8 TRAINING, QUALIFICATIONS, AND DRILLS

A site should conduct a training needs analysis to determine the additional training requirements and content necessary to ensure an effective remote response. This analysis should be performed using the same training process applied to the development of the site's EP training program. The training analysis should not be limited or focused on the remote ERO responders but should also address the ERO members responding from physical ERFs. A suggested process for identifying appropriate training for implementation of a remote ERO is:

- Perform a training needs analysis to determine what knowledge, skills or abilities are required to enable a remote response.
- Perform a gap analysis to identify the difference between the current set of knowledge, skills and abilities and the new ones identified in the needs analysis.
- As needed based on the gap analysis, revise the documents that control the ERO training program and the appropriate training materials (e.g., lesson plans, qualification guides, job performance measures, etc.).

After the remote response capability has been implemented, a site should incorporate demonstration of the capability into their drill and exercise program. The frequency and extent-of-play of the demonstration should reflect the manner in which the site implemented the remote response capability. For example, a site choosing to have all holders of a given ERO position respond remotely would always have the players in that position respond remotely during drills and exercises. A site with a mixed pool of responders in a position (i.e., some position holders respond in-person, and some respond remotely) would demonstrate the capability if the player assigned to the drill or exercise is a remote responder. Critiques conducted after these drills and exercises should identify any issues encountered with the remote response; weaknesses identified from the critique should be entered into the appropriate site corrective action process.

9 EQUIPMENT HARDWARE

Similar to specialized applications, provisions must be in place to ensure that a remote responder has access to the equipment or hardware needed to perform their emergency response duties. This includes administrative controls to periodically verify that a responder has possession of the necessary equipment or hardware and is performing any required tests and maintenance. Suggested testing strategies include:

- Monitoring vendor or site information technology department alerts concerning the status of a piece of equipment.
- Requiring individuals filling remote ERO positions to verify their response capability when taking the on-call duty.
- For pooled-response positions, individuals can follow a routine testing schedule to verify equipment functionality.

10 REMOTE RESPONSE REQUIREMENTS

ERO members responding remotely must have the capability to respond within the applicable position and facility activation times described in the site emergency plan. In addition, the licensee should have contingency actions/compensatory measures in place to address instances where an issue prevents an ERO member from responding remotely (e.g., the loss of internet connectivity at an individual's home). These contingency actions/compensatory measures should be sufficiently rigorous to provide reasonable assurance that:

- the affected position's function and tasks will be performed, and
- there is no material adverse impact to the overall performance of the ERO.

Planned contingency actions/compensatory measures should be described in controlled documents.

The ERO positions enabled for a remote response should be clearly identified in the locations and tools used by the ERO to support facility activation and personnel accountability. In particular, the methods for tracking the staffing of ERO positions during and emergency (e.g., sign-in boards, procedures, computer-based user aids, etc.) should clearly identify which positions are physical response and which are remote response. Duty rosters should also identify the personnel staffing remote response enabled ERO positions.

11 CHANGES TO THE EMERGENCY PLAN AND IMPLEMENTING PROCEDURES

A site will need to identify the emergency plan and implementing procedure changes necessary to permit a remote response by the selected ERO positions. This includes a review of the position-specific procedures used by each remote-enabled member and the positions with which they interface. The identified changes should be evaluated in accordance with the site process that implements the requirements of 10 CFR 50.54(q). The guidance in Regulatory Guide 1.219, "Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors," should also be considered. A LAR may or may not be required.

Changes to procedures should also address how to manage a response by multiple ERO members filling the same position (e.g., two or more TSC mechanical engineers respond remotely but only one is needed,) and the contingency actions/compensatory measures to be taken if a position or position holder is unable to respond remotely.

To support the evaluation of the emergency plan and procedure changes, a licensee is expected to conduct an activity (e.g., a drill) to validate (demonstrate) that the remote ERO response can be successfully implemented. More specifically, this activity should validate that the ERO position functions and tasks to be performed remotely can be accomplished in a satisfactory manner. The activity need not contribute to the Drill/Exercise Performance (DEP) and ERO indicators but should be critiqued with weaknesses captured in the appropriate site corrective action process. The activity and outcomes should be documented (e.g., a drill report), and the documentation referenced in the emergency plan change evaluation as supporting the conclusion that there would be no reduction in effectiveness of the emergency plan if the proposed change were implemented.

It is recommended that no emergency plan changes be made that commit to increased ERO staffing or shorter response times as a result of enabling a remote response capability.

12 FITNESS FOR DUTY

Individuals filling remote response positions must adhere to the Fitness-for-Duty (FFD) requirements in 10 CFR 26, “Fitness for Duty Programs,” and station procedures. When applicable, a site should develop a method for remote responders to certify they are fit-for-duty prior to assuming their emergency response positions. For example, a site could use an electronic sign-in board (in WebEOC or a similar tool) with language stating that, by signing-in, the member certifies they are fit-for-duty. This method offers the added benefit of allowing facility managers to see when a position is filled and the name of the position-holder.

13 CYBER SECURITY

A remote responder may require access to telecommunications systems, networked systems, and computer workstations in order to perform their assigned functions and tasks. When establishing access capabilities, the licensee must consider the cyber security requirements in 10 CFR 73.54, “Protection of digital computer and communication systems and networks,” and the site commitments in the NRC-approved cyber security plan. The regulations and the plan cover the protection of digital computer and communication systems and networks associated with safety-related and important-to-safety functions; security functions; emergency preparedness functions, including offsite communications; and support systems and equipment which, if compromised, would adversely impact safety, security, or emergency preparedness functions.

To ensure that remote response capabilities adequately address cyber security requirements, it is recommended that the site Cyber Security Assessment Team be contacted early in the planning process.